Motivational resources, personal characteristics, and grades: an investigation into academic achievement in the UAE

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Abstract

According to Hattie (2003), student differences account for approximately 50 per cent of the variance in academic achievement. In the current study, 'student differences' was disaggregated and two broad categories of predictors, personal characteristics and motivational resources, were formed to investigate academic performance in an EFL preparatory program at a tertiary level institution in the UAE. The category of personal characteristics consisted of SES and gender; the category of motivational resources consisted of psychological variables drawn from Self-Determination Theory (SDT; Deci & Ryan, 1985, 2000). Two studies with two separate cohorts were conducted. In study 1 (N=166), participants had achieved an overall English language proficiency of Band 5 in the IELTS exam, but had failed to gain a minimum score of Band 5 in one of the sub-skills (Reading, Writing, Listening, or Speaking) that compose the overall IELTS score. In study 2 (N=80), participants had failed to achieve the minimum required overall score of Band 5. Participants in study 2 were examined twice: once at the start and once at the end of term. Results indicated that the correlations between motivational constructs in both studies were consistent with the relevant literature. However, in correlation and regression analyses, the direction of the relationships between SES and grades, and between autonomous motives and grades, were contrary to expectations. Recommendations for practice and potential research agendas are discussed.

Declaration

The work in this thesis is based on research carried out at the Department of Education, Durham University, England. No part of this thesis has been submitted elsewhere for any other degree or qualification and it is all my own work unless referenced to the contrary in the text.

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List of Abbreviations

AFSS - Activity-Feeling States Scale

AGT- Achievement Goal Theory

AI - Aspirations Index AMS - Academic Motivation Scale

ANOVA - Analysis of variance

APA - American Psychological Association

AT - Achievement Test

CEPA - Common Educational Proficiency Assessment

CET - Cognitive Evaluation Theory

CIA – Central Intelligence Agency

CG - Continuing Generation

EFL – English as a Foreign Language

ESCS - (Index of) Economic, Social and Cultural Status

FG - First Generation

FTP - Future Time Perspective

GAP - General Aptitude Test

GCC - Gulf Cooperation Council

GCSE - General Certificate of Secondary Education

(HS)GPA - (High School) Grade Point Average

HCT - Higher Colleges of Technology

HISEI - Highest parents' Socio-Economic Index

HOMEPOS - Home Possessions

IELTS - International English Language Testing System

IM - Intrinsic Motivation

ISCED - International Standard Classification of Education

ISCO - International Standard Classification of Occupations

ISEI - International Socio-Economic Index

KR(20) - Kuder-Richardson formula

L1 - First language

L2 - Second language

NQA - National Qualifications Authority

OECD - Organization for Economic Cooperation and Development

OIT - Organismic Integration Theory

OPEC - Organization of Petroleum Exporting Countries

PARED - Parental Education (as number of years of schooling)

PISA - Programme for International Student Assessment

RAI - Relative Autonomy Index

REVO - Relative Extrinsic Value Orientation

RFGI - Relative Financial Goal Index

RQ - Research question

SEM - Structural Equation Modelling

SDT - Self Determination Theory

SES - Socio-Economic Status

SPSS - Statistical Package for the Social Sciences

SRQ-A - Self-Regulation Questionnaire (Academic)

T1 - Time 1

T2 - Time 2

TOEFL - Test of English as a Foreign Language

UAE - United Arab Emirates

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Chapter 1

Introduction

1.1 Factors associated with academic performance

Why is it that some students enthusiastically engage with learning tasks while others appear disinterested? (Wentzel & Wigfield, 1998). Why is it that some students succeed academically while others do not? In other words, what are the factors associated with academic success? (Zusho, Pintrich, & Coppola, 2003). These questions have exercised many teachers' minds, including my own, and many influences have been identified such as the quality of classroom instruction (Willms & Tramonte, 2014) and the success educational leaders have in pursuing their educational vision and regulating a school's disciplinary climate (Leithwood, Day, Sammons, Harris, & Hopkins, 2006)

Hattie (2003), reporting results from a synthesis of over 500,000 studies, concluded that although teachers were important and accounted for approximately 30 per cent of achievement variance, student differences accounted for around 50 per cent. According to Hattie (2003) "it is what the students bring to the table that predicts achievement more than any other variable" (Hattie, 2003, p. 1).

The category of student differences is, however, a very broad one and includes differences in aptitude and personality, differences in personal characteristics (such as SES, gender, and prior knowledge), and differences in motivation (Zusho, Pintrich & Coppola, 2003). In other words, the factors associated with academic achievement are multifarious.

1.2 Motivation and grades

In accord with the belief that any model of human performance must include a motivation component (Cerasoli, Nicklin, & Ford, 2014), one element in the category of student differences, motivation, is of central concern in the current study. Although theories of motivation in education have been used to explain a host of outcomes such as student choices, participation, persistence, help-seeking, and performance (Meece, Anderman, & Anderman, 2006), the current study focuses on the latter and equates academic achievement with grades.

There has been much research into the factors that predict academic achievement (Farrington *et al.*, 2012; Gutman & Schoon, 2013; Heckman & Rubenstein, 2001; Hidi & Harackiewicz, 2000; Linnenbrink & Pintrich, 2002), with evidence to suggest that, beyond intelligence and prior achievement, some motivational constructs contribute incrementally to the prediction of grades (Kriegbaum, Jansen, & Spinath, 2015; Steinmayr & Spinath, 2009). However, relatively few studies have investigated the factors associated with Arabic students' academic achievement when motivational constructs have addressed the students' motives, life aspirations, and competence perceptions (and fewer still have included prior performance and SES as predictors). In the current study, these motivation-related constructs collectively compose the students' motivational resources (Hardre & Reeve, 2003, p. 348) and are drawn from one particular motivation theory, Self Determination Theory (SDT).

1.3 What is motivation?

According to Lens, Vansteenkiste, and Matos (2009), the word motivation is derived from the Latin word 'movere' meaning 'to move' and refers to "psychological forces which move people, bring them into action, and keep them going" (Lens, Vansteenkiste, & Matos, 2009, p. 1). Motivational theories provide a means of understanding what energizes individuals, what aims individuals choose, and why and how individuals move towards their chosen aims and not others (Pintrich, 2003; Vansteenkiste, Lens, Elliot, Soenens, & Mouratidis, 2014).

However, motivation is a somewhat elusive force, a "private, unobservable, psy-

chological, neural, and biological process that serves as an antecedent cause to publicly observable behavior" (Reeve, 2012, p. 151). It has been characterized as an interconnected, multifaceted, and complex phenomenon (Dörnyei & Skehan, 2003) – which is unsurprising given it attempts to explain human behaviour (Dörnyei, Csizér, & Németh, 2006). Despite this, the current study makes use of just one theory of motivation, SDT.

1.4 Why SDT?

SDT is a macro-theory of human motivation and personality (Ryan, 2009) that addresses the puzzle of why some students succeed and others do not by way of a parsimonious theoretical framework in which all humans are viewed as intrinsically growth-orientated beings who possess three basic psychological needs: for autonomy, competence, and relatedness (Ryan & Deci, 2000). The assumption that these basic psychological needs are 'necessary inputs' (Sheldon, Elliot, Kim, & Kasser, 2001, p. 325) whose satisfaction is linked to the organism's adaptive functioning is the theoretical commonality that undergirds all SDT-related constructs. It is also one which makes the theory suitable, it is suggested, for the study of performance in any culture.

Numerous studies have shown that basic need satisfaction is associated with a host of positive outcomes such as well-being (Sheldon, Ryan, Deci, & Kasser, 2004), persistence (Lavigne, Vallerand, & Miquelon, 2007), and engagement (Jang, Kim, & Reeve, 2012). Furthermore, despite questions concerning the generalizability of the need for autonomy (Markus & Kitayama, 1991), SDT-related studies with participants from Bulgaria (Deci *et al*, 2001), Germany (Schmuck, Kasser, & Ryan, 2000), Russia (Ryan *et al*, 1999), South Korea, Russia, and Turkey (Chirkov, Ryan, Kim, & Kaplan, 2003), and China (Zhou, Ma, & Deci (2011) support the view that the satisfaction of this basic need is universally associated with higher self-actualization, self-esteem, life satisfaction, and feelings of interest and competence.

As already indicated, few SDT-related studies have investigated the relationship between the satisfaction of basic needs and academic achievement as measured by

grades (and those that have done so are examined more fully in Chapter 3). Even fewer studies have investigated this relationship when participants were Arabic-speaking university students who attended a mandatory EFL program, and who faced a language-related barrier that had to be overcome before starting their chosen majors. Would basic need-satisfaction still predict academic performance in these circumstances? In order to begin answering this question, the study's motivation-related constructs first need to be outlined.

1.5 Regulation, aspiration, competence

As Vallerand (2004) observed, many motivational theorists have posited the existence of two basic types of motivation; namely, intrinsic and extrinsic. Vallerand (2004) defined intrinsic motivation as "engaging in an activity for itself and for the pleasure and satisfaction derived from participation" (Vallerand, 2004, p. 427). Conversely, extrinsic motivation was defined as "engaging in an activity as a means to an end and not for the activity's own sake" (Vallerand, 2004, p. 427). Hence, one way of delineating different forms of motivation is to examine the reasons why a given behaviour is undertaken; that is, to examine how behaviour is being regulated. In the case of extrinsic motivation, the behaviour is regulated by a reward that is external to the activity; in the case of intrinsic motivation, it is regulated by a reward that is internal to the activity.

The dichotomy between intrinsic and extrinsic motivation has, however, only been a starting point for SDT. Organismic Integration Theory (OIT; Deci & Ryan, 1985), a sub-theory of SDT, argued for an extended typography of behavioural regulation forms, one in which a more extensive range of extrinsic behavioural regulation forms was posited to exist (see Figure 1.1) below. These forms represented varying levels of basic need satisfaction and can be distinguished according to differences in the extent to which individuals feel volitional and the authors of their actions.

Behavioural regulation forms – the motives for undertaking an action – are only one strand in how an individual's motivation can be approached in SDT. Basic needs can also be supported through the aspirations that an individual pursues (Kasser &

Ryan, 1993, 1996). In SDT, two broad categories of aspirations can be discerned, these being intrinsic and extrinsic. The former are associated with personal growth and development, whereas the latter are directed towards the attainment of wealth and other external rewards. According to Kasser *et al.*, (2014), aspirations must be viewed in the context of the individual's entire value system. This is because the pursuit of extrinsic aspirations is not harmful *per se*. Instead, it is their relative importance that matters. Specifically, when the valuing of extrinsic, need-thwarting aspirations overshadows the valuing of need-satisfying, intrinsic ones, this is posited to be maladaptive. As will be seen, empirical studies have shown that the life aspirations pursued by students have implications for academic performance (Ku, Dittmar, & Banerjee, 2012, 2014).

Although the type of behavioural regulation forms and life aspirations that students hold are posited have implications for academic performance, those who engage in academic activities for the interest and enjoyment they bring or the self-growth they promote may still not believe themselves capable of achieving their academic goals. For example, students may hold adaptive forms of behavioural regulation and life aspirations but still believe they lack the requisite academic competence to attain academic success. Hence, there is a need to include a measure of the students' perceived competence. This is the third motivational resource in the current study.

In summary, the current study seeks to explore what relationship the students' motivational resources (and hence, the satisfaction of basic needs) have with academic performance. More specifically, it investigates the relationships between the students' behavioural regulation forms, life aspirations, competence perceptions, and grades. In the following sections, these motivation-related terms are refined further.

1.6 Refining terms

In SDT, a simplex-like motivational continuum (Figure 1.1), in which the regulatory forms that are most alike are closest to one another and the forms that are least alike are furthest from one another, is typically used to describe the relationship that the various forms of regulated behaviour have with one another (Vansteenkiste,

Niemiec, & Soenens, 2010). At one end of this motivational continuum lies intrinsic regulation (Deci, Eghrari, Patrick, & Leone, 1994; Deci & Ryan, 2000). This form of regulation is associated with autotelic behaviours, actions engaged in for the inherent rewards they bring (specifically, interest and enjoyment). It is a fully self-determined behaviour, self-endorsed and self-initiated, and is associated with the satisfaction of the basic need for autonomy. In contrast, and at the other end of the continuum, lies external regulation, an extrinsic form of motivation where actions are engaged in for the external rewards that they bring in contexts that are perceived to be highly coercive and externally controlling. Between intrinsic and external lie introjected and identified regulation. Although both introjected and identified regulations are extrinsic forms of motivation, in the sense that neither is autotelic, introjected is a less self-determined form of behaviour and is closer on the continuum to external regulation, whereas identified is a more self-determined, volitional form of regulation and is closer on the continuum to intrinsic regulation (Ryan, 2012). The extent to which the basic need for autonomy is satisfied is, therefore, a crucial means of distinguishing between the various regulatory forms.

1.6.1 Autonomous and controlled motives

The extent to which behaviour feels self-determined, choiceful, and volitional has given rise to two classes of motives in SDT: autonomous and controlled. The autonomous motives construct includes intrinsic regulation but also adds identified regulation – an extrinsic form of motivation but one that is more volitional than other forms of extrinsic motivation because it is associated with the conscious, well-internalized valuing of an activity (Ryan & Deci, 2000). The autonomous motives construct, therefore, is consistent with basic need satisfaction. In contrast, the controlled motives construct consists of two extrinsic forms of behavioural regulation, external and introjected. These forms of behavioural regulation are considered less volitional and less well-internalized and are associated with of a lack of basic need satisfaction.

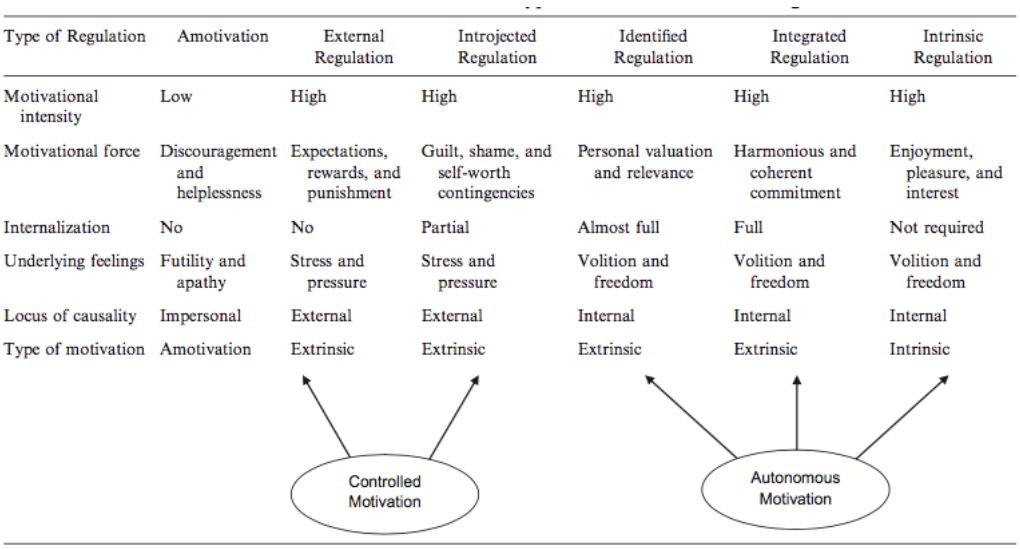


Figure 1.1: Behavioral regulation forms (From: Vansteenkiste, Niemiec & Soenens, 2010, p. 115)

1.6.2 Life aspirations

As for life aspirations, first it should be noted that these can be conceived of in either ideographic or nomothetic terms. The current study has chosen the latter. This means that instead of asking individuals to list their personal strivings and itemize the goals that are of greatest importance to them (ideographic), a given set of aspirations derived from SDT-related theory are presented to individuals, who are then asked to indicate the importance they attach to them. The nomothetic aspirations used in the current study are posited to be either supportive or antagonistic to the satisfaction of basic needs. In a sense, therefore, these aspirations are top-down: they originate in SDT-related theory and their continued relevance is dependent on the SDT-related empirical studies that have argued for their impact on performance and well-being. As for aspirations that support basic needs, these are termed (in line with the SDT-related literature) intrinsic, whereas aspirations that are not need satisfying are termed extrinsic. The current study focuses on one particular set of need-thwarting, extrinsic aspirations concerned with achieving financial success and their centrality within the students' value system. In line with several SDT-related studies (Ku, 2015; Ku, Dittmar, & Banerjee, 2012, 2014), the resultant construct is termed materialism.

1.6.3 Perceived competence

Perceived competence is a measure of how well students believe they can cope with the demands of the course and the success they predict they will achieve. The ability of competence perceptions to predict academic performance is well-supported in the educational achievement literature (Lee & Stankov, 2013; Usher & Pajares, 2008).

1.7 Rationale for the current study

The current study hypothesizes that an aptitude for learning English as foreign language is an important (and perhaps necessary) condition for language learning success, but it is not sufficient one (Phakiti, Hirsh, & Woodrow, 2013): other factors such as motivation are also important. Although other studies have examined the relationship between SDT-related constructs and academic achievement as indicated by grades, these differ from the current study in several ways.

For instance, Black and Deci (2000) and Jang, Reeve, Ryan, and Kim (2009) examined semester grades and behavioural regulation, but did not consider life aspirations. Vansteenkiste, Simons, Lens, Soenens, and Matos (2005) examined the reasons for doing classwork, but not life aspirations and not semester grades. Although, Ku, Dittmar, and Banerjee (2014) did examine the relationship between aspirations, goal motives, and academic performance over an extended period of time, their participants' competence perceptions were not considered. Finally, although there is evidence that variables such as SES affect the relationship between motivation and academic achievement (Guiffrida, Lynch, Wall, & Abel, 2013), few SDT-related studies that have examined academic performance have included measures of SES.

1.8 The scope of the current study

The scope of the current study is limited because it draws only upon SDT. There are a host of other important constructs from other approaches that could have been used to assess motivation such as those from implicit theories of intelligence

(Blackwell, Trzesniewski, & Dweck, 2007) and Achievement Goal Theory (Elliot, 1997). In addition, constructs related to personality traits such as conscientiousness (Trautwein, Lüdtke, Schnyder, & Niggli, 2006) or trait-like dispositions such as general causality orientations (Deci & Ryan, 2000) could have been used but were not.

As for criterion variables, grades are the study's sole indicator of adaptive functioning and success. Grades are taken to be useful indicators of task performance (Pulfrey, Darnon, & Butera, 2013), affording teachers (and students) valuable diagnostic information. Grades are also important because they offer students a means of accessing potentially greater rewards in the workplace by providing them with access to higher educational qualifications. Although grades have these functions, the kind of learning encouraged by assessment practices is outside the current study's empirical scope, which means that the extent to which assessment practices promoted and rewarded deep as opposed to shallow learning is unknown. According to Barron and Harackiewicz (2003), the quality of learning promoted by assessment practices is an important variable if factors predicting academic performance are to be better understood. Finally, by taking grades as the only criterion variable, the study ignores other, potentially even more important, adaptive-functioning indicators such as well-being (Milyavskaya & Koestner, 2011; Ryan & Deci, 2001), vitality (Nix, Ryan, Manly, & Deci, 1999), perseverance (Silva *et al.*, 2010), and persistence (Vallerand, Fortier, & Guay, 1997).

1.9 The UAE

The study was conducted in the United Arab Emirates, an Arabic-speaking country in the Middle East. Initially called the Trucial States by the British, the six Trucial States of Abu Dhabi, Dubai, Sharjah, Fujairah, Ajman and Umm al-Qaiwain formally announced the formation of the United Arab Emirates on December 2nd 1971. This union, which Ras al Khaimah joined later, continues to the present day.

The UAE is a modern, prosperous country whose wealth is principally derived from hydrocarbon products and tourism. However, in the period up to the 1950s,

the seven emirates that eventually joined together to form the United Arab Emirates relied upon farming and fishing, with the area's natural resources being exploited by what has been called the 'versatile tribesman' (Heard-Bey, 2004). However, the discovery of oil and gas deposits saw the country's infrastructure quickly expand. Today, UAE petroleum exports as a share of total OPEC exports stand at approximately 10 per cent (Wam, 2015) while the UAE's per capita GDP, at around USD 67,000, is the twelfth highest in the world (CIA, 2015).

The UAE has also experienced rapid population growth: from a population of 70,000 in the 1950s (NQA, 2013), this has risen sharply, partly because of the influx of expatriate workers, both skilled and unskilled, to over 8.5 million in 2015 (OPEC, 2015). Less than 1.2 million are, however, Emiratis (NQA, 2013). The UAE is a country, in other words, that has undergone enormous change in a relatively short time. It is also a country whose citizens are relatively sheltered from the vagaries of the private job sector through the provision of well-paid and secure government sector jobs. In a survey of young people's attitudes in Ras Al Khaimah in the UAE, Jones (2011) found that "over fifty one per cent of Emiratis selected 'government', 'police', or 'military' as their top (career) choice" (Jones, 2011, p. 13). In contrast, only sixteen per cent chose the private sector (Jones, 2011). Indeed, Daleure, Albon, and Hinkston (2014) have suggested that many Emiratis would prefer to be unemployed than work in the private sector.

In summary, the UAE has undergone dramatic change and has become a very prosperous country. The current labour market, with its relative abundance of what Ridge and Farah (2012) describe as low-skilled, public sector jobs, has provided many Emiratis with well-paid and secure long-term employment. The government sector is believed to offer an attractive destination for many young Emiratis.

1.9.1 The UAE's educational system

Currently, a total of twelve years of education is compulsory, which normally means pupils must attend school until eighteen years of age. At present, there are approximately 1,350 government primary and secondary schools in the UAE serving around 700,000 pupils (NQA, 2013). These government schools are free for Emiratis. Of

the students in these primary and secondary government schools, the great majority, over three-quarters, are Emirati. At government schools, English is compulsory and is taught for up to twelve years. A majority of teachers in primary and secondary government schools are expatriates from neighbouring Arabic-speaking countries. In addition to primary and secondary government schools, there are also several hundred private schools of whose fee-paying attendees around one-quarter are Emirati. As for tertiary education, this too is free for Emiratis at federal institutions such as the Higher Colleges of Technology (HCT), Zayed University, and United Arab Emirates University (UAEU).

1.9.2 Achievement in international exams

When compared internationally, the 2009 results on the Programme for International Student Assessment (PISA) indicated that the UAE's schools ranked 42nd in English reading and 41st in science and mathematics (NQA, 2013) out of a total of 65 countries. As for participation by Emiratis in tertiary education, the current participation level of 25 per cent is also below the 75 per cent level in North America and Western Europe (NQA, 2013). It seems fair to say that there is scope for the UAE's secondary school sector to improve its performance.

However, perhaps one of the most pressing educational issues in the UAE, as identified by a succession of research papers sponsored by a variety of institutions such as the Dubai government, the Ministry of Education, and private foundations such as the Sheikh Saud Bin Saqr Al Qasimi Foundation, is the unpreparedness of Emirati students for direct entry into tertiary education courses where English is the principal medium of instruction. In other words, a substantial percentage of students who leave secondary school are unable to begin their chosen tertiary education course because they must first take further training in English as a Foreign Language (EFL). According to Hatherley-Greene (2012), only 10 per cent of Emirati high school students possess the required proficiency in English to begin their chosen major at a federal institution without having to undertake a preparatory course in EFL. Such preparatory courses are problematic for at least two reasons. First, they extend the period of study at college or university for students by up to two

years, adding considerably to the opportunity costs of seeking a tertiary qualification. Second, preparatory courses impact greatly on the federal Higher Education budget, accounting for approximately 30 per cent of total spending (Jones, 2012).

One exam that is often used as a measure of EFL ability and as a 'gatekeeper' for students who wish to enter the tertiary education system in the UAE is the IELTS exam. Consistent with the majority of secondary school leavers not attaining a level of English proficiency sufficient to begin their tertiary education immediately, IELTS exam candidates in the UAE regularly achieve some of the lowest mean scores of any of the top forty test-taking countries in the world. More specifically, the international average for candidates taking the Academic IELTS exam was 5.9 (IELTS.org, 2015), whereas the average for the UAE was 4.9. Similarly, the international average for candidates taking the General Training IELTS exam was 6.2, whereas in the UAE it was 4.7. Even comparing the performance of UAE candidates with the performance of others whose first language was Arabic (and whose average scores were 5.3 for Academic and 5.7 for General training) only serves to underline the sub-standard performance of the UAE candidates.

1.10 Purpose of the current study

Because of the UAE's relatively poor performance in international assessments and exams such as PISA and IELTS, and because of the relative lack of peer-reviewed studies examining the relationship between motivation (as conceived of in SDT terms) and academic performance for tertiary-level Arabic-speaking participants (Kreishan & Al-Dhaimat, 2013), there is a need for researchers to investigate the factors that may be important for academic performance in this particular context.

Thus the current study investigates the potential relationship between motivational resources and academic performance when participants are predominantly Arabic-speaking, when the participants are enrolled in a mandatory course, and when its participants are citizens and residents in an economy that is amongst the richest, in GDP per capita terms, in the world (CIA, 2015). It is hoped that the current study may be of some value in suggesting ways by which educational re-

searchers and practitioners can move towards improving the performance of EFL learners in the institution at which the study was conducted, and further afield.

1.11 The institution

The institution from which participants were drawn is located in the UAE. Approximately 40 per cent of its nearly fourteen thousand students, consisting of both undergraduate and post-graduate students, come from the UAE. Approximately 50 per cent of the remaining students are either from the GCC countries (Saudi Arabia, Kuwait, Bahrain, Oman, Qatar) or Arabic-speaking countries such as Palestine, Egypt, Jordan, Syria, Lebanon, and the Sudan. Less than 10 per cent of the students are categorized as not from the UAE, the GCC, or 'Other Arabs'. The institution, established in 1997, is fee-paying, with an academic staff of approximately 500.

1.12 Organization of the thesis

Finally, the current work consists of seven chapters. In the first (current chapter), an introduction to motivation, a brief overview of SDT, the study's scope, its context, and its purpose are given. In the second chapter, an explication of key constructs is offered. In the third, key empirical studies are examined. In the fourth, the designs of the studies and their instruments are described along with ethical issues that were faced. In the fifth, results for both studies are given, and in the sixth there is a discussion of findings. The seventh chapter explores the implications of the study's findings for practice and outlines suggested research agendas.

Chapter 2

A conceptual overview

2.1 An academic achievement framework

At the broadest level, theoretical support in the Psychology-related literature for the current study's use of the general model of achievement shown in Figure 2 comes from Ecological Systems Theory (Bronfenbrenner, 1977). According to Bronfenbrenner, human development must be understood in relation not just to the individual person but also the larger social context in which the individual is located. One of these contexts, the macro-system, includes culture, which implicates SES and ethnicity.

Although often complicated by terminological issues (Marsh, 1994; Murphy & Alexander, 2000), in several literature reviews of the factors associated with academic achievement (Farrington *et al.*, 2012; Gutman & Schoon, 2012) the models are broadly consistent with Zusho, Pintrich, and Coppola's (2003). Furthermore, several meta-analyses have highlighted the importance of student differences in predicting academic success at college. For instance, Robbins *et al.*, (2004) found that one of the strongest predictors of college GPA was academic self-efficacy. Similarly, in their meta-analysis of over a decade's worth of research into academic achievement at college, Richardson, Abraham, and Bond (2012) identified performance self-efficacy and grade goal as two of the strongest non-intellective predictors. In both Robbins *et al.*, (2004) and Richardson, Abraham, and Bond (2012), prior performance (as HS-GPA) was a medium-sized predictor. Furthermore, the latter found the correlation between intrinsic motivation and college GPA was small (0.17), whereas between

extrinsic motivation and college GPA it was marginal (0.01). Broadly, therefore, some empirical and theoretical support exists in the relevant literature for the use of Zusho, Pintrich, and Coppola's (2003) model.

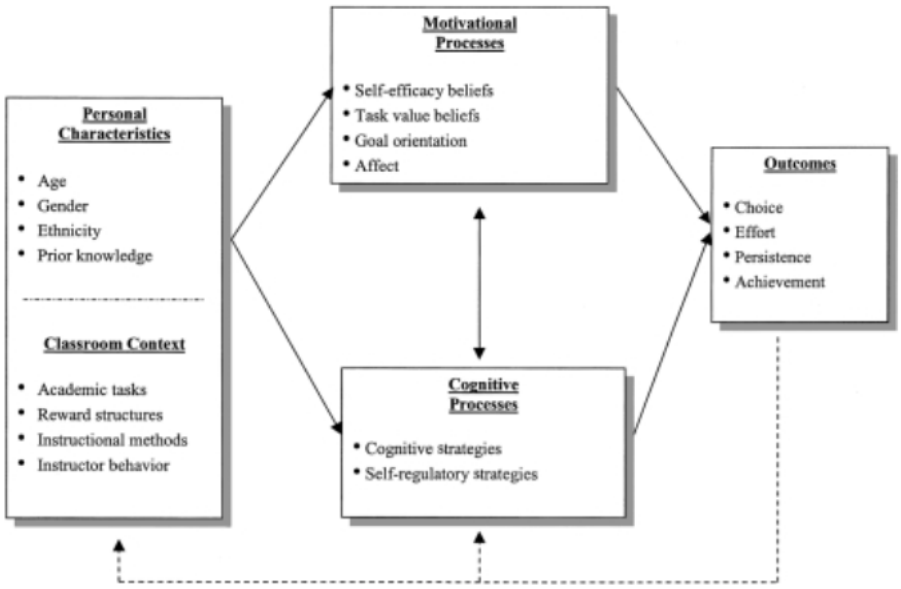


Figure 2.1: General Model of Achievement (From: Zusho, Pintrich, & Coppola, 2003, p. 1082)

2.2 SDT and the general model

Despite broad support in the academic achievement literature (Farrington *et al.*, 2012; Gutman & Schoon, 2013; Robbins *et al.*, 2004) for the model proposed by Zusho, Pintrich, and Coppola (2003), the majority of SDT-related studies have focused more narrowly on SDT-related constructs alone, opting not to, for example, include SES. The current study argues that the model in Figure 2 is consistent with SDT and affords the opportunity to ask whether different, identifiable groups have their basic needs equally fulfilled, or not. In other words, by adopting a model that, for instance, assumes gender and ethnicity are important predictors for motivational processes and academic achievement, the current study assumes that the positive effects that are posited to flow from the satisfaction of basic needs are universally, though not necessarily uniformly, in evidence across all groups.

This is not to say, however, that using the general model is entirely unproblematic. Perhaps one of the greatest difference between Zusho, Pintrich, and Coppola's (2003) model and SDT lies in SDT's meta-theoretical assumption that humans have three innate psychological needs whose satisfaction is associated with a raft of positive outcomes (Deci & Ryan, 2000; Ryan & Deci, 2000). According to SDT, individuals are naturally growth-orientated and ready to engage in the life-long pursuit of need satisfaction (Deci & Ryan, 2000). Furthermore, individuals typically move towards satisfaction of their basic needs by integrating extrinsic forms of behavioural regulation and valuing intrinsic aspirations over extrinsic ones. Not every environment supports basic need satisfaction, and when basic needs are thwarted, the organism's psychological growth is subverted, leading to non-optimal outcomes. In other words, the organism's opportunity to be a 'natural wellspring of learning' (Ryan & Deci, 2000, p. 55) will depend on the level of perceived support for basic needs in the environment. Unlike other motivational theories such as expectancy-value theory (Wigfield & Eccles, 2000) and goal-setting theory (Locke & Latham, 2002), the basic need for autonomy (and hence, autonomy support) in the organism's environment occupies a central place in SDT. Although the importance of autonomy in motivation is contested in the broader motivational literature (Ryan & Deci, 2006), there is at least agreement between SDT and AGT over the psychological need for competence. It is one of SDT's three basic needs, and it is also theorized to underpin AGT, with Elliot and Thrash (2001) defining an achievement goal as "a cognitive representation of a competence-based possibility that an individual seeks to attain" (Elliot & Thrash, 2001, p. 144). For Elliot and Dweck (2005), this basic need for competence is responsible for instigating and energizing motivated behaviour and is apparent across all individuals and all cultures. In other words, SDT and AGT appear to share the same meta-theoretical assumption in regard to the need for, and the importance of, competence in human motivation.

In fact, the link between SDT and AGT does not end with the need for competence. By arguing that aims can and should be separated from reasons, Elliot and Thrash (2001), according to Vansteenkiste *et al.*, (2014), opened the way for a program of research that investigated the reasons, or motives, for holding aims.

More specifically, if the aims an individual pursues (i.e., the 'what') can be considered separately from the reasons for pursuing these aims (i.e., the 'why'), then, Vansteenkiste *et al.*, (2014) posited, these reasons could be viewed as a function of autonomy. Hence, with the separation of aims and reasons, achievement goals can be differentiated according to their competence standards (either 'intrapersonal', 'absolute', or 'normative'), their valence (approach or avoidance) (Elliot & Dweck, 2005; Elliot & Murayama, 2008), and the extent to which the reasons for the pursuit of aims are self-determined.

A number of SDT-related studies have investigated the relationship between achievement goals and learning outcomes with this separation of aims and reasons in place. For instance, Vansteenkiste, Smeets, Soenens, Lens, Matos, and Deci (2010) examined the relationship that aims (as performance and mastery approach goals) and regulation of those aims (as autonomous and controlled motives) had with a host of educational outcomes, including academic achievement. Their results suggested that motives might be even more important than achievement goals in predicting valued educational outcomes, including academic performance. Similarly, Benita, Roth, and Deci (2013) found that mastery goals were positively associated with interest and engagement and that the relationship was strongest for those in an autonomy-supportive context. Other SDT-related empirical studies have also argued for the importance of considering the reasons that accompany achievement goals (Gaudreau, 2012; Gillet, Lafrenière, Vallerand, Huart, & Fouquereau, 2014; Michou, Vansteenkiste, Mouratidis, & Lens, 2014).

By positing that aims can be known by their competence standards, their valence, *and* the motives by which behaviour to attain aims is regulated, the current study argues that Vansteenkiste *et al.*, (2014) has, *ex post facto*, brought the basic needs for autonomy and competence into Zusho, Pintrich, and Coppola's (2003) achievement model. Furthermore, goal orientations can, according to Vansteenkiste *et al.*, (2014), be extended to include longer-terms goals, such as life aspirations. Hence aspirations, the third motivational resource in the current study (in addition to motives and competence perceptions), can be brought into the general model as a form of longer-term goal orientation.

Finally, support for the use of the general model comes from Pintrich himself. Although much of Pintrich's work can be situated within the socio-cognitive tradition, with its focus on cognitive and rational processes (and its exclusion of basic needs), Pintrich nevertheless came to acknowledge the importance of such needs, arguing that future research should seek to integrate different traditions and stating that "self-determination theory is one model that has integrated both needs and socio-cognitive constructs" (Pintrich, 2003, p. 670).

2.2.1 Issues with including SDT in the general model of motivation

Two potential issues are raised by the use of the general model in Figure 2.1. The first concerns the relationship that perceived competence is posited to have with achievement outcomes in the achievement goal literature. The second is the relationship that perceived competence in the SDT-related literature has with self-efficacy beliefs.

Regarding the first of these, according to Elliot and Dweck (2005, p. 60), rather than being a moderator of outcomes as some researchers have suggested (Bråten, Samuelstuen & Strømsø, 2004; Leondari & Gialamas, 2002), perceived competence is best viewed as an antecedent of achievement goal adoption, with those whose perceived competence is high tending to adopt approach goals and with those whose perceived competence is low tending to adopt avoidance goals, though some recent evidence suggests that only approach goals are predicted (Diseth, 2011). It is unclear what Pintrich's view of this was. There has been some debate in the SDT-related literature concerning the relationship that perceived competence has with intrinsic motivation and the issue is examined in more detail in Chapter 3. However, the weight of evidence there suggests agreement with Elliot and Dweck (2005).

As regards the relationship between competence perceptions and self-efficacy beliefs, there are certainly differences between the two. For instance, in self-efficacy theory the specificity at which a self-efficacy judgement is required can differ across three levels, which are global, problem, and task (Phan, 2012). In the limited theorizing that attends the perceived competence construct in SDT, one level, the

global (i.e., course level), tends to be addressed. In addition, SDT-related research appears to take little notice of the consequences of forming competence judgments that are misaligned with actual ability (Gonida & Leondari, 2011) or the impact on the accuracy of competence perceptions when there is uncertainty about the requirements of a task (Pajares, 2002). Nevertheless, when self-efficacy beliefs are operationalized, the differences between the two constructs may be less apparent. In Zusho, Pintrich, and Coppola (2003), self-efficacy beliefs were measured using seven items which addressed the students' perceptions about their ability to learn the course material (p. 1085). In other words, perceived competence beliefs in the current study and self-efficacy beliefs in Zusho, Pintrich, and Coppola (2003) were assessed in a like manner: both contained a relatively small number of items and both were aimed at a similar level. This is in accord with Pintrich's (2003) view that although differences in these constructs exist, they nevertheless point to a similar conclusion, which is that students who consider themselves capable tend to be more motivated, exert more effort, and perform better.

2.3 Personal characteristics

Components of the personal characteristics construct are now examined. This begins with SES, and is followed by prior achievement and gender.

2.3.1 Socio-economic status

Zusho, Pintrich, and Coppola (2003)'s model does not include a direct measure of SES. However, ethnicity is in the model, and as ethnicity and SES are often linked (Saegerts *et al.*, 2007), this is taken as support for including a measure of SES.

The current study's inclusion of SES is held to be consistent with the work of Farrington *et al.* (2012) and Dörnyei (2003), both of whom suggest that student motivation and performance cannot easily be disassociated from society and the broader context in which teaching, learning, and testing takes place. Support for nesting the current study in a broader social context also comes from Gorard, See, and Davies (2012) who argued that SES measures often go unused in the Psychology-

related literature despite having important implications for the predictiveness of psychological constructs when student performance is the focal outcome measure. Addressing the lack of studies in the field of psychology that examine the effects of SES, the recently published findings of the APA's task force on SES asserted that "SES and social class are fundamental determinants of human functioning... and are (of) primary concern for psychological research, practice, education, policy, and advocacy" (Saegerts *et al.*, 2007, p. 1). The current study assumes this to be the case.

In order to operationalize SES, the current study makes use of PISA's (OECD, 2014) SES measures. These measures assess family wealth, parental education level, and parental job status. More details of these are given in Chapter 4. The current study hypothesizes that SES plays an important role in predicting academic achievement: numerous studies have linked lower SES with lower academic achievement (Saegert *et al.*, 2007; Sirin, 2005). Reasons for this association include greater stress that comes with having to live on a lower income (Willingham, 2012), limited access to resources (school quality, teacher quality), and limited educational aspirations (Rothon, Arephin, Klineberg, Cattell, & Stansfeld, 2011).

Related to SES, the construct of first and continuing generation student is also included as a predictor in the current study. Harackiewicz *et al.*, (2014) argued that first generation students, defined as those for whom neither parent has attained a 4-year college degree (p. 1), must overcome psychological barriers such as a perception that the environment is hostile in college if their academic performance in college is to remain unaffected. According to Harackiewicz *et al.*, (2014), many First generation students' academic performances do suffer as a result of these negative perceptions.

Finally, although variables that can be viewed as external to the student – such as SES – are included in the current empirical study, others relating to the classroom, such as teaching styles, are not. This was because this researcher had only conditional access to classrooms and teachers. Fortunately, SES can be relatively easily measured with self-report measures.

2.3.2 Prior achievement

In Zusho, Pintrich, and Coppola's (2003) study, only students' SAT scores were used as indicators of prior performance. However, other studies have shown that both HSGPA and scores on standardized tests are important predictors of college grades (Robbins, *et al.*, 2004). With this in mind, the current study extends the approach in Zusho, Pintrich, and Coppola (2003) by conceiving of prior performance as a function of capacity, propensity, and opportunity.

The importance of differences in general cognitive ability (Gagné & St Père, 2001) or in working memory (Wen & Skehan, 2011) for academic performance underlies the capacity approach, where results on high-stakes tests, as indicators of fluid intelligence, are emphasized. However, as Duckworth points out, "the tendency to put forth intellectual effort in day-to-day living is not impressively correlated with measures of fluid intelligence" (Duckworth, 2009, p. 279). Consequently, the role that propensity, defined as the tendency to put forth intellectual effort in everyday situations and in low-stakes quizzes, plays in academic performance must also be considered.

The potential difference between how a student usually performs (i.e., propensity) and how a student can perform (i.e., capacity) may in part be a function of the effort the student is prepared to make, which may in turn be influenced by the incentives that are on offer (Kautz, Heckman, Dirisi, Ter Weel & Borghans, 2014). High-stakes tests are assumed to offer the greatest incentives, and low-stakes, the least. Following the capacity approach in the current study, the IELTS or TOEFL exam is suggested as a suitable indicator because scores on either of these determine whether the students will or will not be allowed to enter their chosen major directly without having to undergo further English language training. Following the propensity approach, HSGPA (for English) and HSGPA (for all subjects), composite variables composed in part by low-stakes tests, are also suggested as important indicators.

Although the current study operationalizes its prior achievement construct as IELTS or TOEFL scores and HSGPA scores, it is not thereby implied that a given score in any of these is reducible to differences in capacity and propensity alone.

For instance, a student may obtain a high HSGPA in English and a low TOEFL score (and *vice versa*) for a variety of reasons such as differences in grading practices between high schools, differences in how curriculums are implemented (such as a greater or lesser focus on vocabulary acquisition by individual teachers), or differences in retention of what has been learned in school (as a function, perhaps, of the extent to which students have opportunities to practice English outside the classroom). In other words, environmental factors such as access to educational resources and prior educational experiences all impact test scores through the knowledge and skills that students can call upon (Kuncel & Hezlett, 2010). However, although the concept of prior achievement is somewhat problematic because it implicates numerous other constructs such as ability, effort, and environmental factors, it is nevertheless retained.

2.3.3 Gender

Although Zusho, Pintrich, and Coppola (2003) included gender in their general model, their subsequent study did not. The authors recognized this to be one of their study's limitations.

Results from numerous international studies indicate that gender must be considered a potentially important predictor of academic performance. For instance, in PISA (OECD, 2015a), a study that spanned 24 OECD countries and 30 partner countries (including the UAE), results indicated that for reading, girls outperformed boys by the equivalent of one school year (OECD, 2015a, p. 24). Other studies have indicated that females also outperform males at university. For instance, Voyer and Voyer's (2014) meta-analysis showed that although the greatest differences in achievement between males and females appeared in language courses at high school ($d = 0.47$) and although this difference in language course performance lessened at university ($d = 0.21$), a small advantage across all subjects from elementary to tertiary level was evident ($d = 0.22$). In other words, a small but significant gender gap in academic achievement appears to have opened between males and females in many countries, across age groups, and across subjects.

In the UAE, teenage girls outperformed teenage boys, not only in reading but

also in science, mathematics, and problem-solving (Pennington, 2013). The UAE also has one of the highest gender gaps amongst low performers in reading, science, and mathematics, with low performers in the PISA (OECD, 2015a) survey ten-percentage points more likely to be boys than girls. Because girls in the UAE on average outperform boys across all subjects and because a far higher percentage of male students are dropping out of high school (Ridge, 2010), it is perhaps unsurprising that approximately 70 per cent of all higher education students in the UAE are female (Ridge, 2010, p. 9).

According to PISA (OECD, 2015a), one of the reasons why boys tend to underperform relative to girls is boys tend to think of academic achievement as antithetical to masculinity (OECD, 2015a, p. 51). Relatedly, Ridge, Farah, and Shami (2013) point to the lack of a male role model (i.e., teacher) in many UAE high school classrooms as having a negative impact on boys' perceptions of schooling. Jones (2011), however, points towards a different reason. Specifically, it is the relative ease with which Emirati males can obtain well-paid (but low-skill) public sector jobs in government, the police, and the military that encourages male underperformance. These ideas are re-examined in more detail in Chapter 6.

Consistent with the seeming devaluation of academic success by many boys, results in PISA (OECD, 2015a) indicated that girls generally invest greater effort than boys in both high and low stakes tests (OECD, 2015a, p. 58). Therefore, because of the potential importance of gender in predicting academic performance, it is included in the current study.

2.4 Motivational resources

The current study focuses on motivational resources as opposed to, for instance, cognitive ability variables because of the assumed malleability of the former. However, this is not to imply that cognitive ability variables are fixed or that pedagogy informed by cognitive research cannot help improve student performance (Alloway & Alloway, 2010; Alloway, Gathercole, Kirkwood, & Elliott, 2009). Instead, it is assumed that some motivational resources may be comparatively more malleable.

In addition, the current study posits that the use of SDT-related constructs is not incompatible with Zusho, Pintrich, and Coppola's (2003) general model, with Section 2.2 above arguing there are several reasons why this is so. The SDT-related constructs used in the current study are now further refined.

2.4.1 Motives and competence

Following Ratelle, Guay, Vallerand, Larose, and Senécal (2007) and Vansteenkiste, Simons, Lens, Sheldon, and Deci (2004), two composite categories of behavioural regulations, or motives, are made use of in the current study: autonomous and controlled. The former consists of identified and intrinsic regulation, while the latter consists of external and introjected. These collective terms cross the boundary between intrinsic and extrinsic motivation; however, in current SDT-related theorizing, an antagonistic dichotomy between intrinsic and extrinsic motivation no longer exists (Scott Rigby, Deci, Patrick & Ryan, 1992). This is because some forms of extrinsic behavioural regulation – identified regulation, for instance – can be undertaken more autonomously than others (Sheldon, Turban, Brown, Barrick, & Judge, 2003). As discussed in Section 2.2, it is posited that behavioural regulation can be integrated into the general model of achievement via the goal orientation construct.

The current study also argues the basic need for competence, whose satisfaction is measured as perceived competence, can be linked to the general model via the similarities the construct shares with self-efficacy (Section 2.2). However, this is not to overlook the differences between the two. In SDT, the need for competence is central to a view of humans as innately active and curious creatures (Ryan & Deci, 2000). Furthermore, the satisfaction of the need for competence is distinct from the satisfaction that is derived from successfully completing an action and obtaining extrinsic rewards from it; hence: "the experience of competence in and of itself is a source of satisfaction and a contributor to well-being over and above any satisfaction resulting from the outcomes that competence might yield" (Deci & Ryan, 2000, p. 257), with Elliot and Dweck (2005) suggesting that the need for competence has an evolutionary purpose, ensuring individuals are able to develop and survive in mutable environments.

SDT proposes that both perceived autonomy and competence underlie intrinsic motivation. External events such as evaluations, competitions, and rewards can be perceived as informational or perceived as controlling. Events that are perceived as informational, that promote a sense of competence and autonomy, will increase intrinsic motivation, whereas events that are perceived to be controlling, that lessen perceived competence and autonomy, will undermine intrinsic motivation (Deci, Koestner, & Ryan, 2001). Students may feel competent and be intrinsically motivated by positive performance feedback (from winning a competition or from getting good grades, for example), but differences in levels of intrinsic motivation will be evident between those who have succeeded in a non-pressurized, autonomy-supportive environment and those who have succeeded in a pressurized, controlling one (Reeve & Deci, 1996). In other words, when individuals interpret events or contexts as coercive or controlling, when contexts are perceived not to promote the basic need for autonomy, intrinsic motivation tends to be undermined even though the need for competence is supported (Ryan, 1982). In SDT, and unlike self-efficacy theory (Bandura, 1993), perceived autonomy, in addition to competence, is argued to be supportive of both intrinsic motivation (Pelletier, Fortier, Vallerand, & Brèire, 2001) and academic achievement (Black & Deci, 2000).

Finally, the need for relatedness has been variously understood as a striving to be meaningfully connected with others (Ntoumanis, 2001), to share a sense of mutual respect with others (Luyckx, Vansteenkiste, Goossens, & Duriez, 2009), and to feel loved and respected by others (Miserandino, 1996). Although the basic need for relatedness is not directly measured in the current study, it has also been shown to facilitate intrinsic motivation (Van Nuland, Taris, Boekaerts, & Martens, 2012).

2.4.2 Life aspirations

The current study also includes life aspirations as a predictor. This construct is at the level of over-arching values. According to Kasser, 2002, p. 123) values can be seen as guiding principles in life because they help organize goals and behaviour by specifying desirable end-states. According to Kasser (2002), the organismic valuing process links the satisfaction of basic needs to adaptive outcomes. More specifically,

values emerge from an evaluative process, one in which the organism tends to positively value those activities that are supportive of its basic needs and its innate tendency for growth (and devalue those that are not). However, not every environment is supportive of basic needs. When needs are thwarted, need substitutes arise instead.

According to Kasser and Ryan (1993, 1996), aspirations are either intrinsic or extrinsic. The former are theorized to be supportive of basic needs, while the latter are not and are considered to be need substitutes. Need-satisfying aspirations include those associated with community, personal growth, and meaningful relationships. In other words, these aspirations bring their own intrinsic rewards. Conversely, need-thwarting aspirations include those associated with the achievement of fame, image, and money. In other words, these aspirations bring rewards that are extrinsic.

The question as to why the valuing of intrinsic aspirations should be expected to be performance enhancing then arises. Why should basic need satisfaction facilitate academic achievement? According to SDT, when intrinsic aspirations are pursued, the nutriments required for growth are more likely to become available. In terms of academic performance, the pursuit of intrinsic aspirations should mean that individuals are more focused on developing their skills and talents, and that this will encourage greater task engagement and better performance (Unaue, Dittmar, Vignoles, & Vansteenkiste, 2014).

The absolute values of extrinsic and intrinsic aspirations can be calculated separately, but the current study follows the advice of Dittmar, Bond, Hurst and Kasser (2014) whose meta-analysis argued that an individual's aspirations should be viewed in relation to all the other aspirations in the value system. Hence, rather than a value's absolute importance, it is the value's relative importance that matters most. Furthermore, the current study follows Ku, Dittmar, and Banerjee (2012, 2014) and focuses on a subset of extrinsic aspirations. This subset, which is termed materialism, is concerned with the relative importance of money in the individual's value system. As argued above, Vansteenkiste *et al.*, (2014) provides theoretical support for placing longer-term goals, as represented by aspirations, in Zusho, Pintrich, and Coppola's (2003) general model of achievement.

2.5 The current study's criterion variables

Academic achievement is the focus of the current study, and it is operationalized as mid-term exam scores, final exam scores, coursework, and semester grades (which is composed of mid-term scores, final exam scores, and coursework). The indicators of academic performance therefore include both standardized (mid-term and final exams) and non-standardized (coursework) components.

2.6 A bounded study, a bounded model

The study is bounded in many regards (See Section 1.8). For instance, although there are other potentially important outcomes associated with academic success such as energy (Deci & Ryan, 2008), homework completion (Katz, Eilot, & Nevo, 2014), less depleting self-control (Muraven, 2008), persistence (Pelletier, Fortier, Vallerand, & Brière, 2001) and engagement (Appleton, Christenson, & Furlong, 2008; Reeve, 2012), the current study's focus is on grades. This is not to suggest that these outcomes are any less important, either for facilitating academic achievement or for supporting an individual's mental and physical health. In addition, the model is also bounded: for instance, there is no direct measure of SES in it. Below (see Section 2.9), it is argued that ethnicity (which does appear in the model) and SES are often linked (Saegert *et al.*, 2007).

2.7 Key assumptions

The current study makes at least three key assumptions. First, it is assumed that the General Model of Achievement is representative of other general models of academic achievement, and that the inclusion of SDT-related constructs in it is consistent with recent theorizing (Vansteenkiste *et al.*, 2014) and Pintrich's own (2003).

Second, the current study assumes that learning is a good that should be pursued and that the extent to which learning has taken place can be indexed by grades (Allen, 2005). However, the current study does not enquire into the nature of that learning. Thus no data is gathered on the extent to which rote or conceptual learning

is promoted in the program – either through the actions of individual teachers or through the exams that the students must pass.

Third, the current study also assumes that if there is evidence in the relevant literature that personal characteristics and motivational resources predict academic performance in an L1 environment, a similar relationship can be expected in an L2 environment.

2.8 Construct levels

As for the levels at which the instruments used in the current study are aimed, the situational level (that is, at the level of an individual's perceptions of a specific task) is not assessed. Instead, the individuals' motives and competence perceptions are assessed for all four EFL skills together (i.e., Writing, Speaking, Reading, and Listening) in study 2, a level of assessment that is probably closest to Vallerand's (2002) contextual level. In addition, the study also assesses aspirations at a global level, which is more stable in temporal and situational terms than the contextual level. In fact, the values assessed in aspirations are, according to Kasser (2002), more like personality variables because they are "guiding principles of life (that) organize people's attitudes, emotions, and behaviors, and typically endure across time and situations" (Kasser, 2002, p. 123). As the current study makes use of these over-arching values and investigates their importance to academic performance, a question arises as to whether teachers could be expected to exert any influence on them, which in turn questions the usefulness of including them in the current study.

However, there are at least two reasons why it may not be unreasonable to assume that teachers can do so. First, assuming teachers can have an impact on motivational resources at the situational level, it has been suggested that what Vallerand and Ratelle (2002, p. 51) call "recursive bottom-up effects" can affect motivation at the next level up. In other words, what happens at one level may have an effect on the next level up (Standage & Treasure, 2002). This holds out the theoretical promise that teachers' actions at the lowest (situational) level working with students in classrooms on specific tasks might have an influence, via the intermediate, con-

textual level, on the highest level of constructs; that is, on student values. Although Vallerand and Ratelle's (2002) hierarchical model has recently been challenged by the heterarchical model (Milyavskaya, Philippe, & Koestner, 2013), this model also seems to offer continued support for the belief that lower level effects can impact higher, more global levels. Second, a number of recent experimental studies that have examined students' purposes for learning (construed in relation to the aim of learning and the meaning that this has to the students' life or worldview) have attempted to engender self-transcendental aims for learning, which are arguably at a similar level as aspirations. Manipulating these transcendental aims was not only found to be possible, but results suggested these manipulated aims were associated with long-lasting academic advantages (Yeager *et al.*, 2014). Findings such as these suggest that other, value-like constructs such as life aspirations may also be open to manipulation. However, as Yeager *et al.*, (2014) note, there is little in the educational psychology literature to guide educators on how to accomplish such an objective.

In summary, although the current study utilises both higher-level variables such as life aspirations and lower-level ones such as motives and competence perceptions, there is one aspect of these constructs that underlies and unites them all: basic needs. It is the satisfaction or thwarting of these basic needs that the current study hypothesizes will have implications for academic performance.

2.9 Issues in the current study

The first issue concerns controlling for previous performance. If HSGPA is in part a function of propensity, HSGPA will also be a function of motivational resources. To control for HSGPA may thus be to control for (to some unknowable extent) motivational resources.

A second issue concerns the assumption that if basic needs are being met (as indicated by the motives, competence perceptions, and life aspirations that are held by the students), this can and will be converted into higher marks. This may be problematic for at least two reasons. First, it ignores the potential impact of feedback on

the choice of new goals, a 'loop' that features in Dörnyei and Otto's (1998) Process Model of L2 Motivation and offers the theoretical basis for students modifying or continuing their actions towards a given goal. The current study, by comparison, takes a somewhat non-dynamic approach to goals in the sense that it assumes that the students' grade-related goals remain constant throughout the course. Dörnyei and Otto's (1998) model, on the other hand, opens the possibility that students, once they have received new feedback information (in the shape of mid-term results and on-going coursework assessments) indicating that they have attained the grades they might have set out to attain, may choose to pursue 'passing' rather than 'excelling' grades. Because the current study takes no direct measure of students' reactions to on-going achievements (i.e., it does not monitor for changes in their grade goals), or their effort (either actual or planned), the study has to assume that the students who have their basic needs satisfied exert all the effort theoretically open to them at all times throughout the course and are continuously directed towards grade maximization. Second, there is the question of the relationship between the satisfaction of basic needs, cognitive processing, and grades. The satisfaction of basic needs, it has been argued, encourages the deep processing of information (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004, Study 2) as well as greater creativity (Amabile, 1996). It should be noted that in the former study, deep learning was assessed using a single reading text. After reading this, pupils assessed their own depth of processing. Five days later, they were required to give a presentation about the same text. Nine days after that, they were given a written test about the same reading material. In both the presentation and the written task, pupils were graded by their own class teacher. Potential issues such as the appropriate classification of a remembered fact as an indicator of either deep or shallow processing and the (presumed) equating of the ability of a pupil to recall information from a text read two weeks previously with that pupil's deeper initial processing of the reading material serve to highlight the difficulty of operationalizing deep and shallow learning.

If need satisfaction is associated with cognitive processing advantages, one issue is the extent to which these potential advantages are exploitable in terms of grades. If a given exam tests just the shallow processing of information (i.e., more rote learning

than conceptual understanding) and if it requires less creativity, it is unlikely that students whose basic needs are satisfied will have their deeper involvement in the subject rewarded with better grades. While it is true that it cannot be assumed that the assessments that provide the current study's criterion variables privilege a surface approach to learning, it cannot be dismissed either. Meece, Anderman, and Anderman (2006) may contend that students' deep-learning is not often tested by common assessment practices (Meece, Anderman, & Anderman, 2006, p. 499), but the extent to which assessments in the current study conform to this characterization is unknown.

A final issue concerns SES and the study's demographic variables. As Saegert *et al.* (2007) have pointed out, social class often "intersects with race, ethnicity, age, sexual orientation, and (dis)ability" (Saegert *et al.*, 2007, p. 5). In the current study, limited demographic information was obtained from participants. For instance, no information was gathered on the participants' nationality. Given the participants were not just Emiratis but were also from other, often poorer, nations such as Palestine and Sudan, there is a possibility that SES and nationality may be conflated in the current study. Some support for this possibility comes from Russell (2012). According to Russell (2012), Emirati males, due to their gender and nationality, hold a privileged position in the UAE relative to Emirati females and non-Emiratis. Although occupying a position of privilege is often associated with access to better resources and greater knowledge about and expectations for achieving academic success (Bourdieu, 1986), Russell (2012) indicated that these relatively privileged individuals were less likely to consider themselves good students or report themselves as working as hard as their non-Emirati peers.

2.10 Research questions

As the current work is embedded within a particular theoretical perspective that conceives of motivation in SDT-related terms, with motivational resources (motives, life aspirations and perceived competence) construed in SDT-related terms. Specifically, motivation has been conceptualized as autonomous and controlled motives; life

aspirations have been conceived as materialism; and competence beliefs as perceived competence.

The current study is interested not just in the relationship its psychological predictors have with its criterion variables and with one another; it is also concerned to know whether demographic factors such as gender and SES play a role in academic achievement and how these might be related to motivational resources. With this in mind, the current work wishes to know the answers to six main questions:

1. How are the current study's predictor variables inter-related? What are the relationships between the current study's (non-change) motivational resources; namely, perceived competence, autonomous and controlled motives, and materialism? What are the relationships between these (non-change) motivational resources and the personal characteristics constructs? How are the personal characteristics variables inter-related?

2. What is the relationship between the personal characteristic variables and grades?

3. What is the relationship between the current study's motivational resource variables (as non-change variables) and grades? Is the satisfaction of basic needs directly associated with a performance advantage when performance is expressed as grades? Do motivational resources remain predictive of grades when SES, prior performance and gender have been controlled for?

4. What are the relationships between the study's motivational resources change variables and grades? Do changes in motivational resources remain predictive of grades when SES, prior performance and gender have been controlled for?

5. What is the relationship between first and continuing generation students and grades? Are first generation students academically disadvantaged compared to their continuing generation peers (Harackiewicz *et al.*, 2014)?

6. Is there evidence of important differences between the students in study 1 and study 2?

Chapter 3

Empirical studies

3.1 An outline of the current chapter

The current chapter discusses the (mostly SDT-related) empirical studies that are of greatest relevance to the current study's research questions. The chapter is organized according to these research questions, beginning with studies that have examined the relationships between the current study's predictor variables. Next, the relationships between personal characteristics and academic performance as well as the relationships between motivational resources and academic performance are considered. After that, the question of whether certain SES groups (or related subgroups) may be academically disadvantaged is assessed along with the evidence on how differences in the motivational resources of two, separate groups are related to grades.

3.2 Q 1: How are the study's predictor variables inter-related?

As indicated previously in Chapter 1, two broad categories of predictors are used in the current study. These are motivational resources and personal characteristics. First, what the literature says about the relationships between the various motivational resources variables is discussed, followed by personal characteristics.

3.2.1 What is the relationship between autonomous motives and competence?

In SDT-related studies that have examined the correlational relationship between self-determined forms of motivation and competence, correlation co-efficient sizes have been mixed, but the direction has always been positive. For instance, in Grolnick, Ryan, and Deci (1991), perceived competence and perceived relative autonomy were also found to be positively correlated ($r = 0.25$, $p < 0.001$) for their sample of 456 American children. In Soenens and Vansteenkiste (2005), the correlation between the Relative Autonomy Index (RAI) and scholastic competence (a broad measure of competence in school) for their 328 Belgian adolescents in Study 1 was 0.18 ($p < 0.01$). In Jang, Reeve, Ryan, and Kim's (2009) Study 1 with 256 Korean high school students, the correlation co-efficient between four items from the SRQ-A (to measure intrinsic motivation only) and competence was 0.74 ($p < 0.01$). In their Study 2, with 272 Korean high school students, the correlation was again large, where $r = 0.76$, $p < 0.01$. It should be noted that these researchers used the Activity-Feeling States Scale (AFSS) (see Section 4.6.3), which is different to the measure of competence used in the current study. Black and Deci (2000) with 137 American Chemistry majors, found the correlation between the RAI (at Time 1) and perceived competence (at Time 2), which was measured using the same instruments as the current study, was medium-sized, where $r = 0.39$, $p < 0.01$.

When relations between more self-determined forms of motivation and competence were modelled, path coefficients were mostly medium-sized, with betas of 0.54 ($p < 0.01$) in Alivernini and Lucidi, (2011), 0.47 ($p < 0.001$) in Soenens and Vansteenkiste, (2005, Study 1), and 0.55 ($p < 0.05$), 0.47 ($p < 0.05$), and 0.32 ($p < 0.05$) in Jang, Reeve, Ryan, and Kim, (2009, Study 2, 3, and 4 respectively).

Differences in the sizes of the relationships between more self-determined forms of motivation and competence may in part be due to differences in educational contexts, number of predictors included in modelling, and instruments used. For instance, Soenens and Vansteenkiste (2005) used the SRQ-A (Ryan & Connell, 1989) to obtain an overall measure of self-determined motivation (relative to other be-

havioural regulation forms that are not self-determined). This measure is called the RAI. In line with CET (Guay, Boggiano, & Vallerand, 2001), they posited that self-determined motivation was an antecedent of competence. Again in line with CET, Jang, Reeve, Ryan, and Kim (2009) measured autonomy support from the teacher as a predictor of basic need satisfaction and hence, intrinsic motivation. As indicated above, intrinsic motivation was measured in isolation of all other forms of behavioural regulation. In addition, competence was measured in relation to tasks within a particular classroom.

In summary, the size of the relationship between competence and more self-determined motives differed across the studies reviewed here. If results from Jang, Reeve, Ryan, and Kim (2009) are disregarded (as only intrinsic motivation was measured), the correlation size in the other studies reviewed approximates to 0.25. As for the relationship between less self-determined motives and competence perceptions, results in Hardre and Reeve (2003) indicated the size of the correlation between their measure of competence (the AFSS) and non-self-determined motivation was -0.14.

3.2.2 What is the relationship between autonomous and controlled motives?

The reported size of the relationship between autonomous and controlled motives differs considerably in the SDT-related literature. One possibility is that the stage participants occupy in their educational careers is a factor in explaining this. Specifically, there is some evidence to suggest that the relationship between more and less self-determined forms of behavioural regulation may be higher for high school students compared to college students. For instance, in Ratelle, Guay, Vallerand, Larose, and Senécal's (2007) Study 1 with 4,498 Canadian high school students, the correlation between intrinsic regulation and introjected regulation was found to be large, $r = 0.74$, $p < 0.01$. Similarly, in their Study 2 with 942 Canadian high school students, the correlation was again large, $r = 0.60$, $p < 0.01$. In contrast, in their Study 3 with 410 Canadian college students, the correlation was small, $r = 0.29$, $p < 0.01$. By way of explanation, Ratelle, Guay, Vallerand, Larose, and Senécal

(2007) argued that these Canadian college students faced fewer constraints and as a consequence were better able to pursue their own choices at college (p. 742).

Although there are methodological differences in how motivation was measured, with Ratelle, Guay, Vallerand, Larose, and Senécal (2007) using the AMS, which makes it difficult to know if similar results could be expected in the current study (which uses the SRQ-A), further evidence for autonomous and controlled motives not being strongly associated for college students comes from Vansteenkiste, Sierens, Soenens, Luyckx, and Lens (2009). In this study, whose participants were 484 first-year Belgian college students, motivation was measured using an adapted form of the SRQ-A. The correlation between autonomous and controlled motives was again found to be small, where $r = 0.19$, $p < 0.001$. In addition, results from two studies by Vansteenkiste, Zhou, Lens, and Soenens, (2005), in which 153 and 79 Chinese adults participated and where the correlations between autonomous and controlled motives were small ($r = 0.17$, $p < 0.05$ and $r = 0.32$, $p < 0.01$), suggest that similar, small correlations between motives can be expected for non-Western, college-level learners. Conversely, in their study with 122 gifted Jordanian students aged 15-17, Al-Dhamit and Kreishan (2014) reported the correlation between intrinsic and extrinsic motivation was large, $r = 0.61$, $p < 0.01$. Similarly, Butler (2015) also reported a large correlation between intrinsic and extrinsic motivation in her study with 572 Chinese children aged 9 to 14, where $r = 0.53$, $p < 0.01$. In conjunction with results in Vansteenkiste, Zhou, Lens, and Soenens, (2005), these results suggest that rather than culture, it is the educational stage the participants find themselves in that plays an influential role in whether or not autonomous and controlled motives are strongly correlated.

However, Areepattamannil, Freeman, and Klinger's (2011) study refines this suggestion. In their study, 355 immigrant Indian adolescents in Canada and 363 non-immigrant Indian adolescents in India were the participants. The researchers showed that the correlation between intrinsic and extrinsic motivation for the latter group (where $r = 0.57$, $p < 0.01$) was higher than the former (where $r = 0.34$, $p < 0.01$). Areepattamannil, Freeman, and Klinger (2011) hypothesized that the lack of autonomy support for the non-immigrant Indian adolescents' group was key

to understanding differences between the two groups' motivational patterns and academic performance, suggesting that it is not educational stage *per se* but the lack of autonomy support (that often attends a particular educational stage) that is important. Contrary to the belief that autonomous and controlled motives are strongly correlated for high school students, in Vansteenkiste, Sierens, Soenens, Luyckx, and Lens (2009) Study 1, whose participants were 881 Belgian secondary school students, the correlation was just 0.02 ($p = ns$). Interestingly, in their Study 2, whose participants were 484 first-year college students, the correlation between autonomous and controlled motives became *negative*, where r = -0.19, $p < 0.001$.

In summary, the studies reviewed above suggest that the relationship between autonomous and controlled motives for the current study's students might be small, given the participants are older and attend college. However, the circumstances that the participants in the current study face are quite different to those faced by many other college-age participants. Specifically, the current study's participants must undergo compulsory language training and obtain satisfactory grades in the IELTS or TOEFL exams in order to begin their choice of major. If, as Ratelle, Guay, Vallerand, Larose, and Senécal (2007) suggest, autonomous and controlled motives tend to be more strongly correlated when students face less choices and less autonomy support, then correlations between these constructs in the current study can be expected to be larger, and thus closer in size to those found in the majority of studies with high school participants.

3.2.3 What is the relationship between materialism and motives?

Results from early SDT-related studies suggested that extrinsic goals tend to be pursued for controlled reasons while intrinsic goals tend to be pursued for more self-determined reasons (Kasser & Ryan, 1993, 1996). For instance, in Kasser and Ryan (1993, p. 415), t-Test comparisons found that participants who placed higher importance on money had statistically significantly higher controlled orientations than those who placed greater importance on family and global welfare. However, contrary to the belief that wealth tends to be pursued for controlling reasons, Carver

and Baird's (1998) results indicated that financial aspirations and self-determined motivation were statistically significantly positively correlated, where $r = 0.65$, $p < 0.001$ but that financial aspirations and controlling reasons were only moderately positively correlated, where $r = 0.38$, $p < 0.001$.

Data on the correlational relationship between aspirations and motives is not abundant. In Sheldon, Ryan, Deci, and Kasser, (2004), regression analyses indicated that relative autonomy was positively associated with measures of well-being, whereas extrinsic aspirations were not. Aside from supporting the belief that *both* motives and goal contents have implications for well-being, these results do not directly describe the relationship between motives and aspirations. Similarly, Vansteenkiste, Simons, Lens, Sheldon, and Deci (2004) experimentally manipulated goal contents and goal motives. Their ANOVA and regression results across their three studies indicated that the group of participants in the autonomy-supportive (as opposed to controlling) context who were pursuing intrinsic (as opposed to extrinsic) goal contents showed better test performance and persistence. However, in none of their three studies was a complete set of the correlations between goal motives and goal contents presented, making it impossible to know for certain what the direct relationship between these two constructs was.

Fortunately, Utvaer, Hammervold, and Haugan (2014) do examine the direct relationship between motives and aspirations. As the current study uses a subsection of the AI concerned with wealth, it is particularly interesting that their results showed aspirations concerned with wealth were more strongly correlated with controlled motives (where $r = 0.41$, $p < 0.01$) than autonomous motives ($r = 0.15$, $p < 0.01$) and that on average, intrinsic aspirations (of affiliation, community, and personal growth) were more strongly correlated with autonomous motives than controlled, albeit that the direction was positive in all these cases (p. 14).

Finally, although Black and Deci (2000, p. 746) did not make use of the AI or measure aspirations in their study, they did examine grade orientations. Just as grade orientations measure the extent to which students endorse the pursuit extrinsic rewards (as grades) over learning, so the AI measures the extent to which students endorse the pursuit other forms of extrinsic rewards, such as money and fame, over

intrinsic rewards, albeit at the level of values. Black and Deci's (2000) analysis indicated that grade orientation and the RAI were negatively correlated, where r = -0.25, $p < 0.01$.

In summary, there are only a limited number of SDT-related studies that examine the relationship between aspirations and motives in the context of academic achievement. The few there are suggest materialism, because it is a construct that measures the relative importance of extrinsic goals such as money, will be more strongly correlated with controlled motives than autonomous ones in the current study.

3.2.4 What is the relationship between materialism and perceived competence?

Again, few studies have examined the relationship between materialism and perceived competence in the context of education with academic performance as a criterion variable. Utvaer, Hammervold, and Haugan's (2014) study indicated that personal growth, affiliation, and community (all intrinsic aspirations) were statistically significantly positively correlated with perceived competence. For instance, the correlation between personal growth and perceived competence was the strongest of all, where $r = 0.37$, $p < 0.01$. In contrast, the aspiration for wealth was not (r = 0.03, *ns*).

Similarly, although self-esteem is a far broader concept than perceived competence, results in an experimental study (Study 4) by Kasser *et al.*, (2014) indicated that an intervention designed to diminish materialistic goals by fostering sharing and diminishing the importance of spending was a success, with those in the control group reporting statistically significantly higher levels of materialism and lower levels of self-esteem than those in the intervention group. Their correlational results indicated that at Time 1, 2, and 3, materialism and self-esteem were statistically significantly negatively correlated, where r = -0.24, $p < 0.05$,r = -0.21, $p < 0.05$, and r = -0.25, $p < 0.05$ respectively.

In summary, these results suggest that the materialism measure in the current study will be negatively correlated with perceived competence. However, the size of

the correlation may be small.

3.2.5 What is the relationship between prior performance and SES?

According to a recent OECD report, "prior knowledge is one of the most important resources on which to build current learning as well as one of the most marked individual differences among learners (furthermore) prior knowledge is critically dependent on the family and background sources of learning and not only (on) what the school or learning environment has sought to impart" (OECD, 2010a, p. 16). Such a statement would seem to suggest that in the current study SES, will be positively related to prior knowledge. If prior knowledge is a positive predictor of academic achievement (Sackett, Kuncel, Arneson, Cooper, & Waters, 2009) and if SES and prior knowledge are positively associated, it seems reasonable to expect that SES and academic performance would be positively associated with one another.

3.2.6 What is the relationship between gender and motivational resources?

In Vansteenkiste, Sierens, Soenens, Luyckx, and Lens's (2009, p. 676) Study 1, *t*-Tests revealed that female secondary school students were statistically significantly more autonomously motivated than the male students. In their Study 2, *t*-Tests again revealed that female college students were statistically significantly more autonomously motivated than the male students.

In Boiché and Stephan (2013. p. 87) with 510 French college students, cluster analysis showed that more females than males had the most self-determined motivational profile. These general findings are echoed in a host of other studies. For example, in Kusurkar, Ten Cate, Vos, Westers, and Croiset (2013) with 383 Dutch medical students, females were shown to hold more self-determined motivational profiles and achieve higher GPAs than males. In Kusurkar, Croiset, Galindo-Garré and Ten Cate (2013, p. 6), females were found to hold statistically significantly less controlled motivation than males and were more likely to have a motivational pro-

file characterized as interest- rather than status-based. No statistically significant differences were found in intrinsic motivation however. In Yurtseven, Altun, and Aydin (2015) with 211 Turkish university students attending a preparatory course in EFL, t-Tests revealed that female students had higher self-efficacy beliefs than males. In Mohammadi, Moenikia, and Zahed-Babelan (2010), self-efficacy for learning and performing in EFL was found to be higher for female Iranian high school students than males.

Finally, in a meta-analysis of the relationship between materialism and well-being, Dittmar, Bond, Hurst, and Kasser (2014) found that gender was a statistically significant moderator, with males more materialistic than females. They suggested that one reason for this was because "men...are traditionally viewed as the breadwinners" (p. 914).

In summary, there is evidence (across different nationalities, subjects, and age groups) to suggest that females in the current study will hold more adaptive motivational resources than males. However, what the sizes of the correlations between gender and motivational resources might be is uncertain.

3.2.7 What is the relationship between SES and motives?

In the SDT-related literature, there are only a limited number of studies examining the relationship between motivational resources and SES. Ratelle, Guay, Larose, and Senécal's (2004) longitudinal study of how students' academic motivation changes during the transition from high school to university included an unspecified SES measure. Their results suggest that regulatory styles and objective SES measures were generally unrelated.

Alivernini and Lucidi's (2011) study also raises doubts about objective SES measures being correlated with motives. In their study, Alivernini and Lucidi (2011) measured regulatory styles using the Relative Autonomy Index (RAI). They found a non-statistically significant correlation between SES and the RAI even when the SES measure was specified and extensive (it made use of the procedures in PISA). These studies together suggest that SES and autonomous and controlled motives in the current study, which also uses an SES measure drawn from PISA, will not be

related.

However, the opposite is suggested by Butler (2015). Results from this study indicated that although intrinsic motivation levels were not significantly different in lower grades, by eighth-grade, levels for students in the lower SES group had dropped significantly, with ANOVA results showing that the difference in means between lower SES students and higher SES students for intrinsic motivation represented an effect size of 0.22 (Butler, 2015, p. 173).

In summary, Butler (2015) suggests that objective SES measures and motives will be statistically significantly positively associated, whereas Ratelle, Guay, Larose, and Senécal (2004) and Alivernini and Lucidi (2011) suggest they will not. In other words, the relationship between objective SES measures and motives, as indicated in the available literature, is unclear.

3.2.8 How are SES and competence related?

Unfortunately, few SDT-related studies have explored the relationship between SES and perceived competence. Butler (2015) examined 572 Chinese students of EFL aged between 9 and 14. Her results indicated that the difference in competence perceptions between the highest SES group and the lowest was equivalent to an effect size of 0.13 (Butler, 2015, p. 173).

In a study with 2,520 American 4-year college and community college students by Guiffrida, Lynch, Wall, and Abel (2013, p. 130), results from their overall model showed competence perceptions were positive predictor of college GPA, where $\beta = 0.176$, $p < 0.01$; however, no interaction with SES was found.

In summary, there is little in the SDT-related literature to guide expectations. These limited results suggest the size of the relationship may be small or even marginal.

3.3 Q2: How are grades and personal characteristics related?

The next section explores the importance of personal characteristics (SES, prior performance and gender) in academic achievement. It investigates whether these variables predict grades and reviews what evidence there is in the SDT-related literature on how these variables are related.

3.3.1 What is the relationship between SES and grades?

As indicated in Chapter 2, student background and prior performance constructs form part of the current study's general model of academic performance. According to Gorard, See, and Davies (2012), it is important to include SES measures because studies that have not included these and have instead relied only on psychological measures have seen the predictiveness of these psychological constructs diminish or even disappear when SES constructs are added (Gorard, See, & Davies, 2012, p. 10). Another reason for including SES measures is the amount of variance in academic achievement predicted by SES. One large-scale study has suggested this may be up to 14 per cent, depending on the subject (OECD, 2010b, p. 48). Furthermore, results from this study also indicated that the gap in academic performance between different SES groups in Dubai may be 30 per cent larger than this (OECD, 2010b, p. 48). These figures suggest that inclusion of an SES measure in the current study will be important if academic achievement in a UAE-based institution is to be predicted – though it must be remembered that the participants in the PISA study were not college-aged.

Another large-scale study that shows the importance of SES as predictor of educational outcomes is Sirin's (2005) meta-analytic study. With a sample size of over 100,000 kindergarten to high school students, the relationship between the SES and, for instance, general achievement (i.e., GPA) was small but statistically significant, $r = 0.22$, $p < 0.05$ (p. 435). Effect sizes varied according to the achievement outcome (verbal, maths, science, and general achievement), but the mean effect size was 0.29 (p. 435), with Sirin noting that single-subject correlations with SES were larger

than the correlation with GPA and SES (p. 440).

The finding that SES and grades are positively correlated is supported by Sackett, Kuncel, Arneson, Cooper, and Waters's (2009) meta-analysis. Working on data taken from over 2.5 million individuals who took SATs in 1995, 1996, and 1997, their results indicated that SES and HSGPA were also positively correlated ($r = 0.20$). In terms of the current study, these results suggest that SES will be positively correlated with the prior performance indicators, GPA (English) and GPA (All subjects).

Of the few SDT-related studies to include an extensive SES measure, Butler (2015) examined performance in the context of EFL. Her results showed the difference between higher and lower SES students' mean grades equalled an effect size of 0.33 (Butler, 2015, p. 173). As for how SES might affect motivational and performance outcomes, Butler (2014, 2015) suggested that in addition to lower SES parents lowering their expectations for their children's success, higher SES parents also have access to greater resources, pointing to the provision of private tutors and travel abroad as examples of how these parents could encourage intrinsic motivation and promote greater academic achievement. Guiffrida, Lynch, Wall, and Abel (2013) also investigated the relationship between intrinsic motivation, SES, and academic achievement. Their results indicated that SES mediated the relationship between intrinsic motivation and college GPA, with the relationship between autonomous motives and GPA stronger for those in the higher SES groups (where $\beta = 0.22$, $p < 0.05$) than for those in the lower SES group (where $\beta = 0.159$, $p < 0.05$). Guiffrida, Lynch, Wall, and Abel (2013) argued that students with higher SES benefit more from having intrinsic motivation compared to students with lower SES because the latter group had financial concerns (which the former was free of) that impinged upon academic performance.

The belief that lower SES students come from families who face concerns over money and that this encourages a more materialistic outlook is suggested in Kasser, Ryan, Zax, and Sameroff (1995). In their study, Kasser, Ryan, Zax, and Sameroff (1995) argued that family members who must take low-paid employment often face highly-controlling working conditions that demand compliance. Their results indicated that not only do these family members tend to value financial success for their

children more highly than those from higher SES groups (because money is viewed as a means of escape from drudgery and financial concerns), these family members also tend to provide less autonomy-supportive parenting. In addition, their results also showed that students from low SES groups tend to value monetary success more highly than self-acceptance and affiliation relative to higher SES groups (p. 911). Although Kasser, Ryan, Zax, and Sameroff (1995) did not directly test whether those who valued financial success more highly also held stronger controlled motives, their results are suggestive of that, which is in line with the findings of Butler (2015) and Guiffrida, Lynch, Wall, and Abel (2013), but contrary to those of, for instance, Ratelle, Guay, Larose, and Senécal (2004), as discussed in Section 3.2.7.

In summary, large-scale studies such as those by Sirin (2005) and Sackett, Kuncel, Arneson, Cooper, and Waters (2009) suggest the relationship between SES and the current study's HSGPA-related prior performance indicators will be positive and small. Furthermore, results from Butler (2015) and Guiffrida, Lynch, Wall, and Abel (2013) suggest that SES will be positively associated with course grades in the current study, with regression analyses indicating the size of the relationship will also be small.

3.3.2 What is the relationship between HSGPA and grades in college?

HSGPA has been shown to be an important predictor of academic achievement in college (Atkinson & Geiser, 2009; Geiser & Studley, 2002) despite differences in how high school students are graded in different institutions. However, in the current study, the efficacy of HSGPA as a predictor of academic achievement is viewed with some uncertainty: three higher educational establishments in the UAE use their own exam (the CEPA) as an exit exam in place of HSGPA, which suggests the HSGPA generated by UAE high schools may be a more problematic indicator of student ability than normal.

Despite these concerns, in studies that have included Arabic participants, high school GPA was found to be a predictor of course grades. For example, in Hamaideh and Hamdan-Mansour (2014), high school scores were positively correlated with

college GPA for 510 Arabic health science students at a medical college in Saudi Arabia ($r = 0.39$, $p < 0.001$). In Alghamdi and Al-Hattami (2014) with 417 Saudi participants, HSGPA was significantly correlated with 3rd Year GPA in college, where $r = 0.59$, $p < 0.01$. In addition, when 3rd Year GPA was regressed on HSGPA, and on scores in a General Aptitude Test (GAT) and an Achievement Test (AT), results indicated that HSGPA remained a significant predictor of academic performance for both students in the Humanities and Applied Medical Sciences colleges. In the current study, it is expected that HSGPA will be positively related to grades. However, a limited number of empirical studies and concerns over the accuracy of the HSGPA measure make this conclusion uncertain.

3.3.3 What is the relationship between IELTS scores and grades?

In the current study, self-reported results from the IELTS exam are also used as an indicator of students' prior performance. It has been suggested that IELTS is a better predictor of college GPA than TOEFL (Hill, Storch, & Lynch, 1999). Support for this comes from Woodrow (2006) who reported a medium-sized correlation between overall IELTS band and college GPA ($r = 0.40$, $p < .01$), as did Feast (2002) ($r = 0.39$, $p < .01$). Furthermore, scores in the IELTS exam for students have been found to be indicators of college GPA in the UAE (Shoepp & Garinger, 2016). More specifically, Shoepp and Garinger (2016) showed that those students who achieved Band 7 or above outperformed those who scored either Band 6 or 6.5. In contrast to these studies, others have found little or no relationship between IELTS score and college academic performance (Dooey & Oliver, 2002; Garinger & Schoepp, 2013).

In conclusion, there is mixed evidence for whether IELTS scores are predictive of college GPA. However, because the criterion variables in the current study pertain to performance in an EFL training course (and not the participants' majors, unlike the majority of the studies listed above), there is more reason to believe that scores in the IELTS exam will be positively related to grades in the current study.

3.3.4 What is the relationship between gender and grades?

The PISA (2012) results discussed in Section 2.4.3 indicate that high school female students, in the UAE and internationally, often outperform their male counterparts. In the SDT-related literature, a similar effect has been found. For instance, Soenens and Vansteenkiste (2005) showed that girls achieved statistically significantly higher GPAs than boys in both their Study 1 (p. 594) and Study 2 (p. 598).

Kreishan and Al-Dhaimat (2013) have suggested that female Arabic students are more motivated than males in their academic careers because unlike males, girls must face the prospect of having to earn approval from their families according to their achievements and not their gender (p. 60). In the current study, it is therefore expected that females would outperform males. Meta-analysis results from Voyer and Voyer (2014) (also discussed in Section 2.4.3) suggest that on average the size of the academic advantage that female students have is small, where d = 0.21.

3.4 Q3: How are motivational resources and grades related?

The relationship between the current study's motivational resources and academic performance is explored in the relevant literature. This begins with autonomous and controlled motives and moves on to consider competence perceptions and aspirations.

3.4.1 What is the relationship between autonomous and controlled motives and grades?

Unlike a number of cross-cultural studies in SDT which have tended to focus on well-being outcomes (Ryan, Chirkov, Little, Sheldon, Timoshina, & Deci, 1999; Schmuck, Kasser, & Ryan, 2000), Vansteenkiste, Zhou, Lens, and Soenens (2005) with 105 Chinese learners aged 18-39 took (self-reported) performance in the IELTS exam as one of its criterion variables. Correlational results indicated that autonomous motivation ($r = 0.24$, $p < 0.05$) was positively correlated with self-reported grades. The correlation between controlled motives and self-reported performance was close to zero

($r = 0.01$, *ns*). Subsequent regression analysis in their Study 1 revealed that, after controlling for the number of years that the students had studied English as well as the students' self-reported current level of English, autonomous motives positively predicted expected exam performance ($\beta = 0.21$, $p < 0.05$). In contrast, the relationship between controlled motives and exam performance was non-statistically significantly negative (β = -0.04, *ns*). Similarly, Vansteenkiste, Sierens, Soenens, Luyckx, and Lens (2009) separated autonomous motives from controlled and examined the relationship these had with grades separately. Their results (in Study 1) with their 881 Belgian secondary school participants indicated that autonomous motives were positively correlated with grades ($r = 0.30$, $p < 0.001$), whereas controlled motives were negatively correlated (r = 0.-12, $p < 0.001$.)

Vansteenkiste, Zhou, Lens, and Soenens (2005) and Vansteenkiste, Sierens, Soenens, Luyckx, and Lens (2009) are important because they used the SRQ-A to create an autonomous motives construct (summing intrinsic and identified regulation scores), and a controlled motives construct (summing introjected and external regulation scores), which is what the current study proposes to do. Results in their studies are taken as evidence that more need-satisfying, self-determined forms of behavioural regulation as measured by the autonomous motives construct will be associated with better performance regardless of culture, which is consistent with SDT and the belief that need-satisfaction is universally associated with adaptive outcomes (see Chapter 1), though the question of whether this relationship remains when high-quality SES variables are added remains uncertain.

Another issue is the criterion variable in Vansteenkiste, Zhou, Lens, and Soenens's (2005) Study 1. This was self-reported performance in the IELTS exam, and it presumably involved students retrospectively reporting their exam results, which raises the issue of directionality. Were the students autonomously regulated because they achieved good results, or did they achieve good results because they were autonomously regulated? Correlational studies such as Vansteenkiste, Zhou, Lens, and Soenens's (2005) cannot be expected to establish causal direction, but when motivational resources are measured after results have been made available, directionality becomes even more problematic. Nevertheless, results from both these

studies suggest that the correlation relationship between autonomous motives and grades in the current study will be positive and small, whereas the relationship between controlled motives and grades may be marginal or negative.

However, other studies raise questions about this belief. Instead of using composite measures of motives (such as autonomous and controlled), Burton, Lydon, D'Alessandro, and Koestner (2006) examined the relationship that individual behavioural regulation forms had with academic performance. In this study with 241 Canadian elementary school children aged from 8 to 13, correlational results showed that identified regulation (but not intrinsic regulation) was significantly correlated with report cards which were delivered seven days later ($r = 0.26$, $p < 0.001$). In addition, their hierarchical multiple regression analysis indicated that identified regulation was a significant predictor of report card grades, $\beta = 0.24$, $p < 0.001$, whereas intrinsic regulation was not. Examination of interactions between forms of regulation, grades and positive affect, where form of regulation and grades were the predictors and positive affect was the criterion variable, indicated that intrinsic regulation predicted positive affect regardless of performance. Conversely, not only was identified regulation found to predict performance, but also positive affect was found to be dependent upon perceived success, as indicated by the statistically significant interaction between integrated regulation, performance and report card grades.

In terms of the current study, Burton, Lydon, D'Alessandro, and Koestler's (2006) results suggest that only one element in the autonomous motives construct (identified regulation) will be a statistically significant positive predictor of academic performance, which implies that the strength of the relationship between the autonomous motives and academic performance in the current study may be lessened if one element in the construct has a marginal relationship with performance.

Although the studies so far suggest that autonomous motives will be positively related to grades, one potentially important variable, the length of time over which performance was assessed, was not given in either Vansteenkiste, Zhou, Lens, and Soenens (2005) nor Burton, Lydon, D'Alessandro, and Koestler (2006). In contrast, the period of assessment is clearly stated in Baker (2003). This study assessed,

amongst other variables, the motivational orientations of 104 university students who were in their first year and examined academic performance over a three-year period using a prospective, longitudinal design. Baker's (2003) regression results showed that those students with higher intrinsic regulation achieved higher overall marks at the end of their university careers (i.e., after 3 years), after controlling for entry qualifications ($\beta = 0.22$, $p < 0.05$). Again, similar to Burton, Lydon, D'Alessandro, and Koestner (2006), Baker (2003) did not create a summative construct to measure motivational orientations, preferring instead to examine the relationship that individual forms of behavioural regulation had with GPA. However, unlike Burton, Lydon, D'Alessandro, and Koestner (2006), Baker (2003) found (explicitly measured) intrinsic regulation to be the most important predictor of academic performance. Baker's (2003) results raise the possibility that the age of participants and period over which assessment of performance extends are variables that affect the relationship between intrinsic regulation and academic performance, with intrinsic regulation an important predictor of academic performance over longer periods of time in college-aged students. In the current study, the participants' performance is assessed over a period of approximately four months. It is uncertain whether this period of time is of sufficient length for the effects of being intrinsically motivated to have the same beneficial effects as those demonstrated in Baker (2003).

Understanding the precise relationship motives have with grades and the conditions under which that relationship is likely to change is further complicated by the use of another construct in the SDT-related literature to measure motives, the RAI. The RAI is a single, global assessment of the relative strength of self-determined motives (which is often derived from the SRQ) and it has been used in a number of studies whose results also suggest that greater self-determined motivation will be positively related to academic achievement. For instance, in Soenens and Vansteenkiste (2005), the relative autonomy for school construct was positively correlated with grades for the participants in both their Study 1 and Study 2, where $r = 0.32$, $p < 0.001$, and $r = 0.22$, $p < 0.01$ respectively. Regression results indicated that the RAI (for school) was postively associated with grades, where $\beta = 0.27$, $p < 0.001$ and where $\beta = 0.18$, $p < 0.05$ in their Study 1 and Study 2 respectively.

In their meta-analysis of 18 studies (cross-sectional and longitudinal) that used the Academic Motivation Scale (AMS; Vallerand *et al.*, 1992) to investigate the potential importance of autonomous motivation to academic achievement for elementary, high school, and college students, Taylor *et al.*'s (2014, p. 345) Study 1 showed that moderate effect sizes were observable for intrinsic regulation, d = 0.27 [CI = 0.23, 0.32] and identified regulation, d = 0.35, [CI = 0.31, 0.39]. Taylor *et al.*'s (2014) Study 2, in which a total of 524 high school students initially took part, confirmed the importance of intrinsic regulation for achievement (as measured as self-reported general grade) after controlling for baseline achievement. Intrinsic regulation was also found to be positively associated with a composite of results on official science and maths grades for 1135 college students (Taylor *et al.*, 2014, Study 3) and science grades for 440 Swedish high school students, after controlling for prior achievement (Taylor *et al.*, 2014, Study 4). As well as arguing for the importance of intrinsic regulation in achievement, Taylor *et al.*'s (2014) study also indicated that academic achievement predicted intrinsic regulation, suggesting that a reciprocal relationship between the two exists. This is in contrast to the results reported in Garon-Carrier *et al.*, (2016), which indicated that academic achievement predicted intrinsic motivation, but not *vice versa*.

Studies where EFL grades were the criterion variable also indicate a postive, albeit small, relationship between self-determined motives and grades. For instance, in Al Khateeb and Nasser (2014), a median split was performed on the GPA results of 413 Arabic university students. Results indicated that there was a small but statistically significant difference between the groups in motivation, where the group with the highest GPA in their majors was also the group with the highest levels of self-reported motivation (d = 0.28, $p < 0.05$). Similarly, in Noels, Clément, and Pelletier (2001) with 59 French-Canadian participants in an English immersion course, a small, positive correlation between intrinsic motives and final course grades ($r = 0.28$, $p < 0.05$) was found. In addition, results from a study in the UAE with 363 twelfth-grade students conducted by Midraj, Midraj, O'Neill, and Sellami (2008) also indicated that intrinsic motivation was positively correlated with academic performance (operationalized as results in the CEPA exam, which is used as

a placement exam to test EFL ability by the country's federal education institutions in preference to high school grades), where $r = 0.18$, $p < 0.01$. Conversely, extrinsic motivation was negatively correlated with CEPA score, where r = -0.18, $p < 0.01$. It should be noted, however, that the measures for intrinsic and extrinsic motivation were developed by the authors themselves.

Thus far, whether different studies have used different measures of behavioural regulation, or whether motives have been assessed discretely or summatively, the literature reviewed broadly agrees that more self-determined forms of behavioural regulation are positively associated with grades. In most cases, the size of the relationship between self-determined motives and grades was small and positive. Although there is broad agreement in this, not every study indicates that self-determined motivation is predictive of grades.

For instance, in Kreishan and Al-Dhaimat (2013), whose participants were 166 Jordanian university students and whose criterion variables were semester grades in the students' language-related majors, no statistically significant correlation between intrinsic motivation (or extrinsic motivation) and academic performance was found. Unlike the current study, however, Kreishan and Al-Dhaimat (2013) included identified regulation as part of the extrinsic motivation construct (and not the autonomous motives construct).

Noels, Clément, and Pelletier, (1999) also found no statistically significant correlation between self-determined motives and academic performance. Noels, Clément, and Pelletier's (1999) correlational study examined the relationship between the various forms of behavioural regulation and L2 (French) achievement in a group of 78 students (aged 18-36), theorizing that identified and intrinsic motivation, variables derived from the AMS, would be positively correlated with academic performance. However, although both intrinsic and identified forms of behavioural regulation were positively related to academic performance, in neither case was the relationship statistically significant. Instead, both regulatory forms were statistically significantly positively correlated with the intention to continue and with motivational intensity. It may be significant that the course in their study was only six weeks long if the grade-related performance advantages that come from holding more self-determined

forms of motivation take longer to be realized (Baker, 2003).

Finally, evidence from the PISA reading scores of 27 countries from 2000-2009 indicates that the average correlation between measures of intrinsic motivation and reading scores was 0.01: in other words, essentially no relationship was found between the two at the country-level, a finding that is echoed by scores in maths (Loveless, 2015). It should be noted, however, that the measures used in the PISA study were not SDT ones; hence, it is possible that a somewhat different aspect of intrinsic motivation was measured. In addition, reference bias may have been a factor. If self-assessment judgements about, for instance, interest, tend to be made using relevant others as a means of comparison, and if those relevant others differ across countries, potentially very different frames of reference will have been used for self-assessment purposes (Duckworth & Yeager, 2015), making country-level comparisons problematic.

In summary, across correlational, longitudinal, and meta-analytic studies, the weight of evidence suggests that the relationship between more self-determined forms of behavioural regulation and academic achievement will be positive and small. The present study, in line with Vansteenkiste, Zhou, Lens, and Soenens (2005) and others (Sheldon, Ryan, Deci, & Kasser, 2004; Standage, Sebire, & Loney, 2008; Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004), uses the autonomous and controlled motives constructs. The decision to use the autonomous motives construct (and the controlled motives construct) was taken in response to the uncertainty concerning the relative importance of identified and intrinsic regulation in predicting academic performance (Baker, 2003, Burton, Lydon, D'Alessandro, & Koestner, 2006; Vansteenkiste, Zhou, Lens, & Soenens, 2005). Furthermore, despite other studies showing that intrinsic motivation was a long-term predictor of academic achievement when assessed with a global construct such as the RAI (Black & Deci, 2000; Taylor *et al.*, 2014), in the current study the autonomous and controlled motives constructs were preferred because measures such as the RAI cannot determine whether a move towards a global score of motivation that is more self-determined (i.e., more positive) has occurred because there has been a decline in extrinsic and introjected forms of behavioural regulation, or if intrinsic and identified forms of

behavioural regulation have increased.

3.4.2 How are competence, motives, and grades related?

As indicated in Chapter 1, the current study includes a measure of perceived competence because although students may engage in classroom tasks and activities for various reasons, including for the interest and enjoyment that they bring, it cannot be assumed they feel competent when doing so, or that competence itself is not a separable and important predictor of academic achievement. Hence, the current study is particularly interested in SDT-related studies that have included competence perceptions along with motives as predictor variables when academic achievement was the criterion variable.

One of the first SDT-related studies to suggest that greater perceived autonomy and competence would both be important for academic performance was Grolnick, Ryan, and Deci (1991). Their initial results revealed that perceived relative autonomy, as assessed by the Relative Autonomy Index (RAI), was positively correlated ($r = 0.16$, $p < 0.001$) with semester grades for the 456 children in Grades 3 to 6 who took part. This small correlation was in contrast to the larger correlation between perceived competence and semester grades ($r = 0.32$, $p < 0.001$). In their model of achievement, although paths from perceived competence and perceived relative autonomy to academic achievement were statistically significant, perceived competence was more strongly related to academic achievement ($\beta = 0.28$, $p < 0.05$) than perceived relative autonomy ($\beta = 0.07$, $p < 0.05$). These results suggest that both competence and perceived relative autonomy will be important for academic performance, which is consistent with Miserandino's (1996) findings that although participants may be successful in a task, interest in the task will diminish if participants' autonomy is not supported. However, it may be the case that when competence perceptions are entered in the same regression model, the positive relationship between measures of self-determined motivation and grades becomes smaller.

The belief that competence is antecedent to self-determined motivation was modelled in Guay and Vallerand's (1997) study. Using the AMS, Guay and Vallerand

(1997) constructed a composite measure of autonomy similar to the RAI, which was termed 'self-determined school motivation'. Their Study 2, with 1,098 tenth-grade Canadian participants, used this self-determined school motivation construct and controlled for previous ninth-grade academic performance (in French and Maths, but not History even though this subject formed part of the construct termed tenth-grade academic achievement). Results indicated that the model explained approximately 50 per cent of the variance in grades. Furthermore, their Study 2 model indicated no direct path from perceived competence to academic performance. Instead, the path between perceived school competence and self-determined school motivation was significant ($\beta = 0.29$, $p < 0.05$), and the path between the self-determined school motivation construct and academic achievement in (Maths, French, and Geography) was also significant ($\beta = 0.22$, $p < 0.05$), indicating that self-determined school motivation played a mediational role between competence and academic achievement. Results from Guay and Vallerand (1996) suggest that more self-determined motives can be expected to predict future academic achievement when past achievement is controlled.

Guay, Ratelle, Roy and Litalien (2010), also argued that academic self-concept is best considered an antecedent to autonomous academic motivation. With a longitudinal design and a sample of 925 Canadian high school children, their results supported a model in which the relationship between academic self-concept and academic achievement was mediated by autonomous academic motivation, suggesting a process whereby students who feel more competent more readily explore the subject independently; and in so doing, improve their knowledge and understanding of it.

In the studies reviewed thus far, one (Grolnick, Ryan, & Dec, 1991) has suggested that the size of the relationship between self-determined motives and academic achievement is considerably smaller when competence perceptions are included in regression models, and one has not (Guay & Vallerand, 1997). However, Hardre and Reeve (2003) also examined the relationship between perceived competence, perceived autonomy and academic achievement. The participants in the study were 483 American high school students (9th, 10th, 11th, and 12th grade), and school performance was operationalized as self-reported GPA and expected per-

formance. Student motivation was assessed using the SRQ-A. Instead of the RAI, three variables were created: intrinsic regulation, identified regulation and non-self-determined motivation. Initial analysis revealed intrinsic regulation (r = 0.20, p < 0.001) and identified regulation (r = 0.29, p < 0.001) were significantly positively correlated with GPA and non-self-determined motivation was significantly negatively correlated (r = -0.22, p < 0.001). Perceived competence for achieving (a different measure than the current study's measure of competence) was significantly correlated with GPA, where r = 0.33, p < 0.001. Further analysis using structural equation modelling to create a model of intentions to persist revealed that paths to school performance indicated "the perceived competence effect (β = 0.48) was about twice the magnitude of the perceived self-determination effect (β = 0.25). Hence, our findings suggest that... achievement has relatively deeper roots in perceived competence" (Hardre & Reeve, 2003, p. 355).

In support of the possibility that perceived competence may be a more important predictor of academic performance in the current study than autonomous motives when both are entered into regression, the path between self-efficacy (at Time 1) and teacher grades, which were composed of grades for 421 Italian secondary school students in four subjects (maths, foreign language, history and Italian), approached medium-sized (β = 0.42, p < 0.01) in Aliverini and Lucidi (2011), whereas the size of the path between the self-determined motives construct (RAI) at Time 1 and teacher grades was small (β = 0.15, p < 0.05).

Some researchers have argued that when grades are the criterion variable, measures of intrinsic and instrumental motivation add little to explained variance compared to measures of competence. For instance, in a special issue of Educational Psychology, Stankov and Lee (2014) summarized the data presented in five studies and reported that self-efficacy, rather than motivational forms or goal orientations, was the most important non-cognitive variable when predicting academic achievement. Other studies such as Richardson, Abraham and Bond (2012), who reported the correlation between performance self-efficacy and college GPA was 0.59 (p. 372), also implicitly support the assertion that the self-efficacy construct is of primary importance when predicting grade-related performance.

In summary, results from the studies reviewed above suggest that autonomous motives and perceived competence will be positively associated with grades in the current study. Furthermore, although the majority of studies reviewed suggest that competence perceptions will be stronger predictors of academic performance than constructs measuring self-determined motives, results in several SDT-related studies, such as in Hardre and Reeve (2003) and Aliverini and Lucidi (2011) nevertheless suggest that autonomous motives will explain additional variance in academic achievement when competence perceptions have been controlled. These studies suggest that the size of the relationship between self-determined motives and grades when competence perceptions have been included will be small, with betas not exceeding 0.25.

3.4.3 How are aspirations and grades related?

In the work of Kasser and Ryan (1993, 1996), the centrality (as measured by the degree of importance, and likelihood of attainment) of intrinsic aspirations relative to extrinsic aspirations was explored and the implications for well-being investigated. Their findings indicated that relatively stronger extrinsic aspirations were negatively associated with vitality but positively associated with depression and anxiety and that this was the case regardless of the age, gender, or income of participants. They also argued that these relatively stronger extrinsic aspirations tended to be pursued for more controlled reasons (see Section 3.2.3). The current study's criterion variables do not include well-being measures; nevertheless, the work of Kasser and Ryan (1993, 1996) indicated that extrinsic aspirations were detrimental to adaptive functioning (see Chapter 2). Whether or not the endorsement of such aspirations impacts academic achievement has been examined by researchers at the Children's Consumer Culture Project at Sussex University (Consumer Culture Project, 2017) and is discussed next.

The RFGI and grades

For some individuals, obtaining and displaying expensive possessions gives meaning and purpose to their lives. Ku, Dittmar, and Banerjee (2012) hypothesized that

if aspirations to attain money and material possessions occupied a central place in an individual's set of life aspirations, this would be maladaptive for educational outcomes, including academic performance. Ku, Dittmar, and Banerjee (2012) hypothesized that the pursuit of extrinsic aspirations would be negatively associated with grades because more materialistic individuals would tend to focus more strongly on grades as a form of extrinsic reward, valuing them as a way of showing to others how clever or capable they were rather than as feedback for improving learning.

In order to test these ideas, a subset of questions from the AI was used to obtain a measure of the relative centrality of aspirations towards material possessions and material success (as opposed to intrinsic aspirations such as personal growth and meaningful relationships) for the study's 14- and 17-year-old participants from the UK and Hong Kong. Ku, Dittmar, and Banerjee (2012) called this (slightly adapted) measure the RFGI. Their correlational results indicated that the RFGI and grades were in all cases negatively correlated, albeit not always statistically significantly. Specifically, in their Study 1, the relationship was statistically significant for the 14-year-old participants in the UK and for the 17-year-olds in Hong Kong (where r = -0.17, $p < 0.05$, and r = -0.18, $p < 0.05$ respectively). Arguably, the UK 14-year-olds held less adaptive motivational patterns than the Hong Kong 17-year-olds, given performance avoidance goals were more strongly positively correlated for the former group (where $r = 0.27$, $p < 0.01$) than for the latter (where $r = 0.07$, ns).

The results of Ku, Dittmar, and Banerjee (2012) were extended in Ku, Dittmar, and Banerjee (2014). Their correlational results in Study 1 with 197 British and Hong Kong Chinese 9- and 10-year-old children indicated that the RFGI and exam grades were statistically significantly negatively correlated, where r = -0.46, $p < 0.001$, and where r = -0.49, $p < 0.001$ for the British and Hong Kong Chinese participants respectively).

In summary, results from Ku, Dittmar, and Banerjee (2012, 2014) suggest that for younger participants, the relative centrality of materialistic aspirations is more strongly negatively correlated with academic performance than for older ones. Results in the experimental studies discussed in the next section support the belief that a more materialistic orientation for older students may be detrimental for academic

achievement too.

Experimental studies, aspirations, and grades

Vansteenkiste, Simons, Lens, Sheldon, and Deci's (2004) experimental field studies with 200 and 377 Belgian male and female college students (in Studies 1 and 2 respectively) and 244 Belgian male and female high school students (in Study 3), showed that when students autonomously pursued intrinsic goal contents, an academic performance advantage was discernible in the shape of better results on graded reading tests (Study 1 and 2) and in the execution of a set of Tai-bo exercises (Study 3). The effects of pursuing intrinsic goal contents were shown to be positively associated with grades even after autonomous motives had been controlled. For instance, their Study 1 regression analysis results (Table 3, p. 251) indicated intrinsic goal contents were positive predictors of test performance (measured as a single written test of comprehension and contribution to a class discussion) after controlling for autonomous motives, where $\beta = 0.14$, $p < 0.01$.

Furthermore, their results also suggested that deeper processing and greater persistence were the mechanisms by which the satisfaction of SDT's basic needs, embodied in goal motives and goal content constructs, were causally related to better educational outcomes where, after controlling for autonomous motives, intrinsic goal contents were positive predictors of deep processing ($\beta = 0.31$, $p < 0.001$) and negative predictors of shallow ($\beta = -0.18$, $p < 0.001$).

In summary, Vansteenkiste, Simons, Lens, Sheldon, and Deci's (2004) results point to the importance of assessing both why an individual is motivated and what the individual is motivated to pursue (Deci & Ryan, 2000). If, as Vansteenkiste, Simons, Lens, Sheldon, and Deci (2004) have shown, intrinsic goal contents predict graded performance after controlling for autonomous motives, the current study hypothesizes that the converse may be true: that extrinsic goal contents (operationalized as materialistic aspirations) will negatively predict grades when controlled motives are controlled.

However, although Vansteenkiste, Simons, Lens, Sheldon, and Deci's (2004) study is important, there are several issues that arise when it is used as a guide

to expectations in the current one. First, the current study wishes to explore what the implications of particular patterns of motivational resources might be when academic performance is operationalized as actual semester grades. Although the autonomous motivation composite used in the Vansteenkiste, Simons, Lens, Sheldon, and Deci (2004) predicted deeper processing, better grades and more free-choice persistence, results were based on single learning episodes, whereas the current study is concerned with multiple learning episodes. Second, the current study's motivation constructs address different levels than those in Vansteenkiste, Simons, Lens, Sheldon, and Deci (2004). Specifically, Vansteenkiste, Simons, Lens, Sheldon, and Deci (2004) were concerned with the goal motives and goal contents associated with a particular task, at what might be described as the situational level (Vallerand, 1997; Taylor, 2015), whereas the current study is concerned with the contextual and domain levels (Vallerand, 1997; Taylor, 2015); that is, how students orientate towards and perceive a subject as a whole and the configuration of their life aspirations, which are examined across numerous life domains. Third, in none of the three studies in Vansteenkiste, Simons, Lens, Sheldon, and Deci (2004) was the full Aspirations Index (AI) used. Instead, it appears *ad hoc* items were drawn from it. Intrinsic goal content was variously operationalized using single items only; namely: 'saving the environment' (Study 1), 'personal growth' (Study 2) and 'physical fitness' (Study 3); while extrinsic goal content was operationalized as 'saving money' (Study 1), 'chances of getting a well-paid job' (Study 2) and 'physical attractiveness' (Study 3). The current study uses all of the AI's intrinsic items and all of those that pertain to wealth.

3.5 Q4: How are changes in motivation related to grades?

Black and Deci (2000) is important to the current study because it suggests that if an academic performance advantage from being autonomously motivated is to be found, reasons for joining a course may not be as important as autonomy support in the classroom during the course. Hence, instead of intial levels of relative autonomy

predicting grades, Black and Deci (2000, p. 750) found it was the *change* in relative autonomy from Time 1 to Time 2 that predicted semester grades, where $\beta = 0.21$, $p < 0.01$.

This suggests that studies that address the adaptiveness of more self-determined forms of behavioural regulation should, if possible, use a longitudinal design so that students will have had the opportunity to experience an autonomy-supportive (or thwarting) teaching environment, thus providing an opportunity for changes in their levels of autonomous motivation to be measured. Black and Deci's (2000) study, as well as Baker's (2003), also suggest that assessment of academic performance should be measured over a longer rather than a shorter period of time because the posited effects of being more autonomously motivated may be not be apparent otherwise, an issue that was raised previously in Section 3.4.1.

As for whether mean levels of autonomous and controlled motives can be expected to rise or fall over the current investigation's two waves (in its study 2), in Black and Deci (2000) neither the mean level of autonomous motives nor the mean level of controlled motives fell from Time 1 to Time 2; indeed, the mean level of controlled motives increased marginally (Black & Deci, 2000, Table 1, p. 745). The expectation that the mean level of autonomous and controlled motives would also remain unchanged in the current study is not, however, supported by other SDT-related studies.

For example, results in Otis, Grouzet, and Pelletier (2005) with 646 Canadian 8th, 9th, and 10th grade students indicated that mean levels of both self-determined and non-self-determined forms of behavioural regulations fell year-on-year across the 3-year period of their study. Similarly, Hanneke, Van Nuland, Toon, Boekaerts, and Martens (2012) reported that the mean intrinsic motivation score of their 467 participants (aged 11-17) fell over a period of six months from 3.47 (SD = 1.38) to 2.95 (SD = 1.32). Hanneke, Van Nuland, Toon, Boekaerts, and Martens (2012) pointed to educational practices that routinely (and justifiably) repeat and rework material that is to be learned, and the emphasis that schools and colleges place on obtaining good grades, which are extrinsic forms of reward and as such cannot vitalize students' motivational resources (Reeve, 2012), as reasons why motivation tends to fall.

Results in Lieberman and Remedios (2007) with 1857 Scottish university students also showed that expected interest declined as students progressed through their majors. In contrast, Al Khateeb and Nasser (2014) reported that over the four-year period of their study, the mean motivation scores for their 413 Arabic university students marginally increased, from 27.3 to 28.8.

In summary, the studies reviewed in the current section seem to point to different conclusions about whether mean levels of motivation can be expected to fall or not over the two waves in the current investigation's study 2. Those studies conducted with high school participants suggest mean levels will fall. If the educational context of the current study is closer to the high school context; that is, if the mandatory nature of the course that participants in the current study must undertake is most salient to them, it can be speculated that mean levels of motivation will also fall in the current study 2.

The current study 2 also examines whether static variables (i.e., non-change variables assessed at the start and finish of the semester) predict academic achievement as well as the relationship that *changes* in motives have with academic achievement. In other words, in study 2, motives that are static (i.e., non-change) at Time 1 and Time 2 are measured in addition to changes in motives over the period of a semester, which is held to be in accordance with Black and Deci (2000).

3.6 Q5: Is generational status important?

The possibility that SES sub-groups may hold differing motivational resources has already been discussed in Sections 3.2.7 and 3.2.8. The current study is also interested in another SES sub-group: generational status. Some students at university come from families who have little or no experience of the demands of higher education. Such students are known as first-generation (FG) students. The possibility that these first-generation students perform less well compared to students who come from families in which participation in higher education is established (termed continuing-generation students) has been explored by Harackiewicz *et al.*, 2014.

In Harackiewicz *et al.*, (2014) the semester GPA scores for 798 first-generation

(FG) and continuing generation (CG) American college students were examined, and a significant main effect for generational status (β = -0.17, $p < 0.001$) was found. Harackiewicz *et al.*, (2014) speculated that the reasons for the relatively poor performance of FG students may in part be traced to the quality of education that a student received, the degree to which parents were involved in the student's education, and/or the resources that were available to that student, all of which may be a function of SES (p. 1). However, the authors also proposed that the relatively poor performance of FG students could also be traced to psychological factors such as experiencing the higher education environment as threatening.

Another study that examined the performance of FG students and the potential social class achievement gap in college was Stephens, Hamedani, and Destin (2014). A 147-strong convenience sample of American college students consisting of FG and CG students were randomly assigned to one of two conditions: a difference-education condition (where panellists gave a 1-hour talk about how they achieved success in their educational lives and made deliberate reference to their SES) and a second, 1-hour standard condition in which academic success was discussed but no mention was made of SES. A control group (of non-participants in the panel discussions consisting of FG and CG students) was also formed. After controlling for variables such as race, gender, and prior performance, a positive change in FG scores corresponding to a moderate-to-large effect size (d = 0.70) was found when the GPAs of FG students in the difference condition were compared to the GPA's of FG students in the standard condition.

In summary, results from Harackiewicz *et al.*'s (2014) and Stephens, Hamedani, and Destin's (2014) studies suggest that FG students in the current study might perform relatively less well compared to their CG peers. Harackiewicz *et al.*'s (2013) results also suggest the effect may be small.

3.7 Q6: How were the students in study 1 and 2 different?

Results from Areepattamannil, Freeman, and Klinger (2012) (see Section 3.2.2 for more details) showed that more self-determined motivation (measured using the AMS) positively predicted academic performance more strongly for one group than the other (albeit that prior performance and competence perceptions were not controlled for in regression). Specifically, their results indicated the relationship between self-determined motivation and academic achievement for the Canadian immigrant group was stronger ($\beta = 0.54$, $p < 0.001$) than for the non-immigrant group ($\beta = 0.16$, $p < 0.05$). Similarly, differences were also found when the relationship between the less self-determined motivation and academic performance was examined. Specifically, less self-determined motivation negatively predicted academic performance for the immigrant group ($\beta = -0.18$, $p < 0.001$) but not for the non-immigrant group ($\beta = 0.07$, ns). Areepattamannil, Freeman, and Klinger (2012) suggested that the immigrant group had achieved better academic results because the participants had received better autonomy suport and thus were more strongly autonomously motivated. Areepattamannil, Freeman, and Klinger's approach and results (2012) suggest that by comparing the mean motivational resource scores of the cohorts in the current study, useful insights may be gained as to why one group succeeded in obtaining an overall Band 5 in the IELTS exam (the participants in study 1) while the other group did not (the participants in study 2).

3.8 The evidence against basic needs as predictors of grades

Although there are six research questions listed above, the one that is of greatest interest concerns the relationship between motivational resources and academic performance. As discussed above, there is some evidence to suggest that the study's motivational resource variables may directly predict academic performance. However, there is also evidence to suggest that this may not be the case, with a number

of studies finding little or no relationship between self-determined motivation and grades (Kreishan & Al-Dhaimat, 2013; Noels, Clément, & Pelletier, 1999). Furthermore, there are other issues that problematize the relationship that SDT-related constructs may have with grades. These are now discussed, beginning with the motivational continuum.

3.8.1 The quasi-simplex motivational continuum

Typical of many studies, Noels, Clément, and Pelletier (1999) used the AMS, a measure which assumes that the different behavioural regulation forms lie on this simplex-like motivational continuum (See Chapter 2). However, Cokley, Bernard, Cunningham, and Motoike (2001) suggested that the AMS lacks construct validity. Specifically, they questioned whether the assumption of a simplex-like continuum underlying the AMS is supported by actual results. Fairchild, Horst, Finney, & Barron (2005) raised similar concerns. In their study with 1406 American college students, their results pointed to external regulation being orthogonal in relation to more self-determined forms of motivation. In other words, their results suggested that rather than external regulation and more self-determined forms of regulation being negatively correlated and mutually exclusive, they were in fact independent. Boiché, Sarrazin, Grouzet, Pelletier, and Chanal (2008) suggested that if this is the case, researchers should take a person-centred approach to data analysis rather than a variable-centred one. In contrast to studies questioning the assumption that the various behavioural regulation forms lie on a quasi-simplex-like continuum, others have found support for it. For instance, Otis, Grouzet, and Pelletier (2005), reported that although deviations from the expected pattern were noted in regard to the relationship that identified regulation had with external regulation, results generally supported the simplex-like pattern.

In summary, some uncertainty exists over the assumption, in much of SDT-related research, that constructs on the motivational continuum (shown in Chapter 1) describe a simplex-like pattern and are not orthogonal. The current study proceeds on the assumption that SDT's motivational constructs do indeed lie on a quasi-simplex continuum.

3.8.2 Distinct patterns of motivational resources may not predict distinct patterns of grades

In addition to questions over how variables used in the current study have been conceptualized and measured, there may also be cultural reasons why the current study's predictor variables will not predict academic achievement. According to Fareh (2010), Arabic students "excel when examinations focus mainly on memorisation and rote learning" (Fareh, 2010, p. 3603), an outcome which, he posits, is the product of teaching and testing practices at secondary school which act to diminish the importance of deep-level information processing. This is an important point because the current study assumes that motivational resource advantages (in the shape of need-satisfying motives, competence perceptions, and aspirations) can be turned into grade advantages. In their study, Vansteenkiste, Simons, Lens, Soenens, and Matos (2005) hypothesized that neither extrinsic versus intrinsic goal framing nor autonomous versus controlled motives would predict differential effects in the rote-learning measure of achievement over the short-term. Instead, it was asserted that all framing conditions would encourage some degree of engagement in the study's activities. As expected, their results indicated that differences in performance between extrinsic and intrinsic goals and autonomous and controlled motives were non-significant in the rote-learning condition. In other words, their results showed that when learning tasks (and hence grades) promoted rote learning, differentially adaptive motivational resources (in the shape of controlled or autonomous motives and intrinsic or extrinsic goal contents) did not predict different achievement outcomes as measured by grades. Put differently, grades were unable to differentiate between students holding very different motivational resources.

Although the current study extends the scope of academic assessment, relative to Vansteenkiste, Simons, Lens, Soenens, and Matos (2005), by increasing the number of tasks assessed as well as the length of the period of assessment, any assessment bias towards testing rote as opposed to conceptual learning in the assessments that compose the criterion variables in the current study may militate against the possibility that a performance advantage, in grade-related terms, might be discernible

for those who hold adaptive motivational resources. On the other hand, SDT posits that greater effort (Sheldon & Elliot, 1999), vitality (Ryan & Frederick, 1997) and volitional resources (Chatzisarantis, Hagger & Wang, 2010) will be available to those whose motivational resources are consonant with the satisfaction of basic needs, with results in Vansteenkiste, Sierens Soenens, Luyckx, and Lens (2009) indicating that autonomous motives were positively correlated with effort regulation (where r = 0.48, $p < 0.001$ in Study 1 and where $r = 0.45$, $p < 0.001$ in Study 2), whereas controlled motives were not (where r = -0.11, $p < 0.001$ in Study 1 and where r = -0.13, $p < 0.001$ in Study 2). Thus, even if there is a testing bias that privileges rote learning, the more consistent effort expended by those who hold more need-satisfying motives should result in better performance over time, if effort regulation is important for academic achievement, which results in Vansteenkiste, Sierens Soenens, Luyckx, and Lens (2009) also suggest (see Section 3.4.1 for details).

3.8.3 Concerns over competence perceptions

Finally, although numerous researchers report competence perceptions (or related constructs such as self-efficacy) to be important predictors of academic achievement (Bandura, 1993), there may be reasons to doubt the ability of this motivational resource to predict grades for the Arabic-speaking students in the current study. According to Alrabai (2016), the problem of inflated HSGPAs, which allows some low-performing students to attain grades that are much higher than that their performance merits, is endemic in the Saudi educational system. Why this is so is unclear. It is also unclear whether such a phenomenon affects HSGPA in the UAE, or if it does, whether such potentially inflated GPAs are treated as important indicators of competence by the students in the current study.

3.9 Conclusions

The current study can be thought of as being framed by some key SDT-related empirical studies. The first is by Hardre and Reeve (2003). From this, the current study derives two components posited to be important for grade-related per-

formance; namely, self-determined motivation and perceived competence. Unlike Hardre and Reeve's (2003) participants, the current study's participants are young adults. In addition, Hardre and Reeve's study did not include goal contents, but the current study does. The second is by Vansteenkiste, Simons, Lens, Sheldon, and Deci (2004). From this, the importance of goal contents and goal motives in predicting learning outcomes was suggested. However, unlike Vansteenkiste, Simons, Lens, Sheldon, and Deci (2004), the current study wishes to examine the importance of these motivational resources when semester grades (rather than grades for atomized tasks) are the criterion variable. The third is by Ku, Dittmar, and Banerjee (2014). This research presented evidence that materialistic aspirations were negatively associated with exam performance one year later, controlling for prior performance. Ku, Dittmar, and Banerjee's (2014) study took place in a naturalistic setting and some of its young participants (aged 9 to 11) were from what might be termed a collectivist society (Hui & Triandis, 1986). Although the current study follows Ku, Dittmar, and Banerjee (2014) by examining the potential relationship between materialism and grade-related performance in a naturalistic setting, the current study also wishes to know what relationship, if any, materialism has with academic performance when participants are college-aged. Fourth are studies by Guiffrida, Lynch, Wall, and Abel (2013) and Butler (2014, 2015). Unlike most STD-related studies, these have attempted to understand the relationship between SES, basic need satisfaction and performance. Much of the SDT-related literature contends that adaptive performance-related outcomes will be associated with goal pursuit effects (in the form of autonomous goal motives and intrinsic goal contents), but very few SDT-related studies have asked whether or how SES impacts motivational resources and/or performance.

3.10 A brief summary

Finally, this review of some of the relevant SDT-related literature concludes that there is reason to investigate further the possibility that need-satisfying motivational resources conceived of in SDT-related terms offer discernible performance advantages

in the shape of better grades when students are embarked on a mandatory college course, when SES, and prior performance variables are included in regression analyses, and when motivational resources are formulated as competence perceptions, motives, and aspirations.

Chapter 4

Methodology

4.1 An outline of the chapter

The current chapter begins with a description of how the questionnaires used in the current study were translated. A brief outline of the pilot study and a chronology of the study are given next, which is followed by a discussion of the study's designs, participants, criterion variables, and instruments. Because the study took a more exploratory approach to SES, the steps taken to create the SES variables are also explained. The chapter ends with a brief discussion of the ethical issues that were faced.

4.2 Translating the questionnaires

As the participants were EFL learners who might have difficulty understanding the language in the questionnaires, the questions were translated into Arabic and then back-translated (Brislin, 1980). The initial translation into Arabic was conducted by a bilingual (Arabic and English speaking) EFL instructor, and the resultant Arabic versions were translated back into English by another bilingual EFL instructor. Differences between the two versions were resolved and final versions of the questionnaires produced.

4.3 Two cohorts

Two distinct groups of students were identified within the University's EFL program: Skills students and Foundation One students. These groups differed in relation to the criteria for placement into the program, their skill at English, attendance requirements, and criteria for exiting the program. Skills students formed the cohort for study 1 and Foundation One students the cohort for study 2.

As regards the former, these students had attained an overall Band 5 in IELTS. They took classes in their majors but were also required to attend classes in the University's EFL program as they had failed to obtain a *minimum* score of Band 5 one of the four skills that comprise the IELTS exam (Reading, Writing, Listening, and Speaking). For the students in study 1, the skill they were required to take was Reading, which meant taking three hours of English classes in that subject each week. The Skills courses at the University operate on a pass/fail basis, where an overall score of 60 per cent or above is considered a pass. In other words, the students in study 1 were not required to re-take the IELTS. Instead, a pass (of 60 per cent or above) in the Reading Skills course was sufficient for these students to exit the EFL program and join their chosen major full-time. Typically, students spent one semester in the program.

In contrast, the Foundation One students entered the program at its lowest level and were taking 25 hours of English every week. They had yet to attain a minimum score of an overall Band 5 in the IELTS exam. In order to exit the EFL program, they would need to attain this minimum in the IELTS exam. Unlike study 1, results in study 2 were posted as actual grades (A-F), and not as 'pass' or 'fail'. All the participants in study 2 were required to take all four English language skills (i.e., Reading, Writing, Listening, and Grammar/Vocabulary). Typically, students spend two semesters in the Foundation One program.

4.4 A chronology of data collection

Prior to study 1 and study 2, a pilot study was conducted. Three classes of Skills students (one reading class, one writing class, and one speaking class) took part.

Data for the pilot was collected in the last week of the 2015 Spring semester. Administration of the pilot study indicated there were no problems with the instruments used such as unclear instructions or insufficient time for completion of all the items. The pilot study also provided an opportunity to practise inputting and analysing data in SPSS.

As for study 1 and 2, data collection for study 1 and the first wave data collection for study 2 was conducted at the beginning of the 2015 Fall semester. In total, sixteen classes, with the permission of a total of eleven teachers, were visited. The participants in study 2 were then re-approached towards the end of the 2015 Fall semester, approximately 14 weeks later, and asked to complete the second set of (identical) psychological) questionnaires. For both cohorts, their courses were approximately 16 weeks long.

4.5 Designs and participants in study 1 and 2

The designs and participants in study 1 and 2 are now discussed, beginning with study 1. Although there were differences in design between the studies outlined below, the instruments used did not differ.

4.5.1 Study 1's design

In study 1, data on student differences was collected at the beginning of term, followed approximately 14 weeks later by data on academic performance. Student differences were posited to be predictors of grades; thus, study 1 can be described as having a cross-sectional, prospective design. The consequences of this design for establishing causality are discussed in Chapter 7.

4.5.2 Study 1: Participants

Of the 217 students registered on the University's English language Reading Skills program, 172 participated. This represents 79 per cent of the total number of potential participants. Although 172 students participated in the current study, 6 subsequently dropped out of the course, leaving 166.

4.5.3 Study 1: Participant groupings

Students in study 1 were categorized and placed into four participant groupings. The groupings were based on two factors: 1. Absent or present when the questionnaires were administered; and 2. All academic performance scores were available or all scores were not available. The number of participants in each group for study 1 is listed in Table 4.1 below.

Table 4.1: Groups in study 1

Group	Number
1. Present + All scores	166
2. Present + Mid-term only	6
3. Absent + All scores	36
4. Absent + Mid-term only	9

The focal outcome measure in study 1 was academic performance across the semester. As the final exam score impacts semester grades (because semester grades is a composite composed of final exam score, mid-term exam score, and coursework), those participants who were present when the questionnaire was administered and who sat the final exam were of greatest interest to the current study. Participants in Group 3 and 4 were absent when the questionnaires were administered. Participants in Group 2 did not have a complete set of academic performance indicators. Thus only those participants in Group 1 were considered suitable for further, in-depth analysis. This group consisted of 166 participants (123 females, 43 males).

4.5.4 Study 2's design

In study 2, data was collected in two waves. The same instruments to measure the study's predictor variables were used at Time 1 and Time 2. Once again, grades were the criterion variables.

4.5.5 Study 2: Participants

The participants in study 2 were Foundation One students. A total of 108 Foundation One students participated in study 2, which represents 88 per cent of the students who took the course.

4.5.6 Study 2: Participant groupings

As can be seen in Table 4.2 below, the students in study 2 were separated into one of seven categories. However, only the group that completed the questionnaires at Time 1 and 2 and had a full set of academic performance data was considered for further detailed analysis. This group, Group 1, consisted of 80 participants (56 females, 24 males).

Table 4.2: Groups in study 2

Group	Number
1. Present at T1 and T2 + All scores	80
2. Present at T1 and T2 + Mid-term only	2
3. Present at T1 only + All scores	16
4. Present at T1 + Mid-term only	10
5. Absent + All scores	7
6. Absent + Mid-term only	2
7. Absent + No scores	6

For the purposes of analysing differences in the mean academic performance scores between groups, Group 1's semester grades, coursework scores, final exam scores, and mid-term exam scores were compared with scores for Group 3 and Group 5. Group 1's mid-term results were also compared with the mid-term results for Groups 2, 4, and 6. For groups 1, 2, 3, and 4, mean differences in their SES and psychological scores were explored. No scores were available for Group 7, and so this group was dropped from any further analysis.

4.6 Instruments used in studies 1 and 2

The following section discusses the instruments used to assess motives, life aspirations and competency beliefs. Details are given of each instrument used and rationales provided for the choices made.

4.6.1 Measuring motives

Both study 1 and study 2 utilized the Self-Regulation Questionnaire (SRQ-A; Ryan & Connell, 1989) in order to measure the students' autonomous and controlled

motives. The current study did not make use of the more extensive Academic Motives Scale (AMS; Vallerand *et al.*, 1992). The principle reason for this was that rather than investigate the more finely-grained, tripartite view of intrinsic motivation (IM) that the AMS allows (where three types of intrinsic motivation are identified; namely: IM-to accomplish, IM-to experience stimulation, and IM-to know), the present study was interested in how composite behavioural regulation forms; namely, autonomous and controlled motives might be associated with academic performance.

Although the SRQ-A was originally devised for children (and the SRQ-L for adults), a number of recent SDT studies have used the SRQ-A with older participants. The current study follows Vansteenkiste, Simons, Lens, Sheldon, and Deci, (2004) by using the SRQ-A with young adults. The current study also follows Sheldon, Ryan, Deci, and Kasser (2004) and Vansteenkiste, Zhou, Lens and Soenens (2005) and examines classroom motives using autonomous and controlled motives – rather than a relative autonomy measure such as the Relative Autonomy Index (RAI).

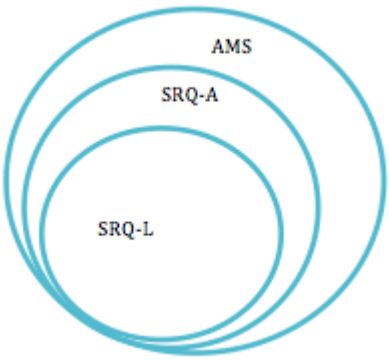


Figure 4.1: Measures of motives

As for the reliability of the SRQ-A, Jang, Reeve, Ryan, and Kim (2009) reported alphas of 0.92 with 256 10th Grade Korean students. Similarly, Vansteenkiste, Zhou, Lens and Soenens (2005) reported reliability estimates of 0.85 and 0.60 for the autonomous and controlled composites in their study of 153 Chinese learners. These are important findings given East Asian and Arabic cultures are often considered to be collectivist (Heard-Bey, 2004; Sheldon, Elliot, Kim, & Kasser, 2001; Jang, Reeve, Ryan, & Kim, 2009; Vansteenkiste, Zhou, Lens, & Soenens, 2005).

4.6.2 Measuring life aspirations

In both Study 1 and Study 2 the Aspirations Index (AI: Kasser & Ryan, 1993, 1996) was used to measure the extent to which participants prioritized materialistic values. The AI's use as a measure of values is premised on a number of assumptions. For instance, it is assumed that the nomothetic aspirations in the AI reflect at least some of the over-arching values that are held by individuals in all cultures and that these aspirations can be usefully represented across one dimension; namely, intrinsic and extrinsic aspirations. This assumption is supported by a number of cross-cultural, SDT-related studies indicating that the valuing of the aspirations in the AI (Ryan, Chirkov, Little, Sheldon, Timoshina, & Deci, 1999) is consistent: individuals across different societies tend to value intrinsic aspirations more than extrinsic. In addition, it is assumed that the intrinsic and extrinsic aspirations that constitute the AI are differentially supportive of basic needs (see Section 2.5.2). According to Kasser (2002) values emerge from an evaluative process, one in which the organism tends to positively value those activities that will be supportive of its basic needs and its innate tendency for growth. It is part of what Kasser (2002) terms the organismic valuing process. Although the SDT-related literature also identifies self-transcendence and a physical dimension (Grouzet *et al.*, 2005) as important over-arching values, other SDT-related studies have supported the assessment of values using an intrinsic/extrinsic approach, arguing that the greater satisfaction of basic needs associated with the pursuit of intrinsic aspirations is the underlying reason why some individuals enjoy higher levels of well-being than others (Kasser & Ryan, 1993, 1996; Sheldon & Kasser, 1998).

Given the AI is a suitable instrument for measuring values, it is possible to examine absolute measures of the importance of either intrinsic or extrinsic aspirations (i.e., in isolation of one another). However, the current study follows the recommendations of Dittmar, Bond, Hurst, and Kasser, (2014) and assesses the importance of values in comparison with other values. In Sheldon, Gunz, Nichols, and Ferguson (2010), their REVO construct used all of the AI's 30 items to arrive at a relative extrinsic value score. In the current study, the relative importance of intrinsic and extrinsic aspirations was also assessed and a composite measure, materialism, ob-

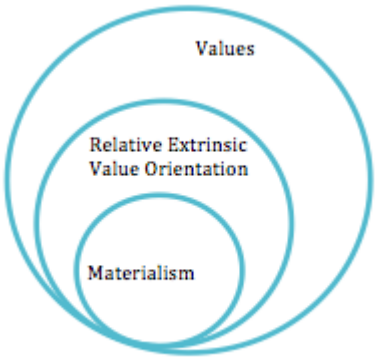


Figure 4.2: Measures of aspirations

tained. However, like Ku, Dittmar, and Banerjee (2014), a materialism measure (which used fewer extrinsic aspiration items from the AI than the REVO) was used to calculate the relative importance of financial success for each participant. This was obtained by subtracting the average importance of self-acceptance, affiliation, and community feeling from each participant's average importance score for financial success. A negative score indicated that the participant was less concerned with financial success relative to intrinsic aspirations, whereas a positive score indicated that financial success was relatively more important than intrinsic aspirations.

Although the AI has been most often used in studies that have taken well-being as their criterion variable, others have suggested that a focus on materialism has negative implications for academic performance (Ku, Dittmar, & Banerjee, 2012, 2014). The present study's materialism measure is not identical to the RFGI measure in Ku, Dittmar, and Banerjee (2014), who used a total of 12 items from the AI. In comparison, the current study uses all of the available items in the AI to measure intrinsic aspirations (i.e., 15 items: numbers 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30) as well as all the available items to measure wealth, money, and expensive possessions (5 items: 1, 7, 13, 19, and 25). Personal correspondence with Ku (L. Ku, personal communication, August, 2015) indicated that selected items from the AI were used because the participants were children. The decision to use all the relevant items on the AI to calculate the current study's materialism measure and assess the relative importance of wealth, money, and possessions follows Kasser *et*

al., (2014), as well as Ku's personal advice.

Finally, Kasser and Ryan (1993, p. 412) reported alpha coefficients on the importance dimension ranging from 0.82 for financial success to 0.58 for self-acceptance. Kasser and Ryan (1996, p. 282) reported that alpha coefficients for the importance sub-scales ranged from 0.59 to 0.87, with a mean of 0.76. Ku, Dittmar, and Banerjee (2012, p. 78) reported Cronbach alpha coefficients (for their 12-item RFGI) ranging from 0.75 to 0.84 for intrinsic aspirations and from 0.87 to 0.92 for extrinsic aspirations. Kasser *et al.*, (2014) reported Cronbach's alpha coefficients of between 0.85 and 0.89 for their materialism measure.

4.6.3 Measuring perceived competence

In both study 1 and study 2, the extent to which the participants perceived themselves to be competent was measured by the Perceived Competence scale (PCS; Williams & Deci, 1996). Scales have been written for specific domains, and the current study uses the Perceived Competence for Learning scale. The Perceived Competence Scale is used in the current study in preference to, for example, the Activity-Feeling States Scale (AFSS; Reeve & Sickenius, 1994) because the latter is concerned with motivational states while engaged in specific activities (situational level), whereas the former is directed towards perceived competence at the level of subject as a whole, which is consistent with the level at which the current study examines motives.

Williams, McGregor, Zeldman, Freedman, and Deci (2004) reported the alpha coefficient for health-related competence was 0.83 at Time 1 and 0.86 at Time 2. Similarly, Williams *et al.* (2006, p. 94) reported alpha coefficients for perceived health-related competence that ranged from 0.91 to 0.93. For learning-related competence, Neff, Hsieh, and Dejitterat (2005) reported an alpha coefficient of 0.88.

4.7 Measuring prior performance

In an attempt to better understand the importance of students' motivational resources for academic performance, the current study wished to control for prior

performance. For both Study 1 and Study 2, prior performance was operationalized as self-reported scores in the IELTS and TOEFL exams as well as GPA (English) and GPA (All subjects). Unfortunately, 92 per cent of participants in Study 1 (Group 1) and 86 per cent of participants in Study 2 (Group 1) did not provide a TOEFL score. As a result, TOEFL score was removed from all further analysis.

4.8 Measuring Socio-Economic Status

Socio-Economic Status (SES) is typically measured with reference to family income, parental education, and parental occupation. According to Cowan *et al*, 2012), these are what is known as the 'Big Three' indicators of the access that students have to social, cultural, and financial capital. In the pilot study, subjective measures of SES and questions asking students to directly quantify their parents' income were used. However, this approach was abandoned for several reasons.

First, the current study assumes that SES is chronologically prior to the motivational resources that the students hold (and the academic results they obtain). By asking for subjective measures of SES, this chronology was blurred: students may have felt demotivated and this may have negatively influenced their perceptions concerning their subjective status in the class. Conversely, others may have felt highly motivated, which may have inflated their perceptions of status. Second, when the students were asked to assess their parents' income (by selecting an income bracket), most stated they had little or no idea what it was. Therefore, in place of its subjective measures of SES and a direct measure of parental income, objective SES measures from the PISA (2012) student background questionnaires (OECD, 2014) were translated into Arabic and used to assess the 'Big Three' components of SES (family wealth, parental occupational status, and parental education).

4.8.1 Family wealth

Following PISA (2012), the current study collected data on 17 household items as proxies of household wealth. Of these, three were specific to the UAE. In PISA (2012), these items were: 'a laptop of your own', 'electronic game' (such as Wii,

Xbox), and 'iPad'. The household possessions variable, termed HOMEPOS, also included the number of books reported in the home.

4.8.2 Occupational status

As for parental occupations, the current study used a list of occupational categories derived from ISCO-08. The major job categories were: 0000 (armed forces); 1000 (managers); 2000 (professionals); 3000 (technicians and associate professionals); 4000 (clerical support); 5000 (service and sales workers); 6000 (skilled agricultural, forestry, and fisheries); 7000 (craft and related trades); 8000 (plant and machine operators, and assemblers); and 9000 (elementary occupations). In addition, sub-major categories were included. Both the major and sub-major categories were then translated into Arabic. In the standard PISA questionnaire, participants wrote their parental occupation (and not a code). However, in the current study, participants were provided with this list and requested to write the appropriate ISCO-08 code for their mother and father's job on their questionnaires. This was done to avoid the need to translate job descriptions written in the students' native language (i.e., predominately Arabic). Following the procedure outlined in PISA (2012), these ISCO-08 codes were mapped onto an international socio-economic index of occupational status (ISEI) (Ganzenboom *et al.*, 2010). The higher occupational status of either parent as indicated by their ISEI was used to create the variable HISEI.

4.8.3 Parental education

In keeping with PISA (2012), whichever of the parents reported the highest level of education provided the single indicator of parental educational achievement (OECD, 2014, p. 311). This variable, expressed as number of years of schooling as indicated by ISCED, was termed PARED. Where neither parent had any qualification, years of schooling were used as a guide. For instance, if neither parent had a qualification but one parent had finished technical secondary, the ISCED level was judged to be equivalent to 12 years of study.

4.8.4 Overall reliability

The median reliability of the overall socio-economic indicator, the ESCS variable (which was composed of the HISEI, PARED and HOMEPOS elements), was 0.69 in the 30 OECD partner countries. This included the UAE (OECD, 2014, p. 353).

4.9 Study 1: the SES investigation

An exploratory approach to the construction of the current study's SES measures was felt to be necessary because the PISA (2012) study was conducted with younger participants (mostly 15-year-olds) and the PISA sample was possibly more heterogeneous given the greater scope of the sampling undertaken.

The following sections outline the three approaches to SES that were taken, beginning with study 1. In the first approach, the key constructs pertaining to family wealth, status, and education – HOMEPOS, HISEI, and PARED respectively – were standardized and factor loadings applied to produce the a standardized and weighted SES measure in accord with PISA standardization and weighting procedures (see Appendix for more details of the linear transformations performed). In the subsequent correlation and regression analyses, the resultant standardized and weighted SES variable was coded as SE.

In the second exploratory step, the same elements used to create the SE variable (i.e., HISEI, PARED, and HOMEPOS) were used, but no standardization or factor loading was attempted. Instead, an SES (Average Score) measure was computed as a simple average score of these three elements. Details are given in the Appendix, Section A.1). However, because of the strong correlation between SES (Average score) and SE, where $r(162) = 0.997$, $p < 0.01$, and in light of the extensive use in internationally validated surveys such as PISA (2012) of a standardized and weighted variable, the SES (Average Score) variable was not considered for further analysis.

In the third step, scale analysis of the HISEI, PARED (2011), and HOMEPOS constructs was conducted, and a new SES variable was created. This SES variable was termed 'Scaled' in subsequent correlation and regression analyses and coded as SS. In study 1, in order to raise the Cronbach's alpha of the SS variable from 0.636

(unstandardized) to 0.790 (unstandardized), 19 of the original 23 items measuring HOMEPOS were retained, but all of the PARED and HISEI items were removed.

Correlations between the various SES variables in study 1 are shown in the Appendix, Table A.1. In keeping with the exploratory approach, listwise and pairwise comparisons were made. Finally, only the SE and SS variables were used in regression analyses in study 1 (as opposed to also using the HOMEPOS, HISEI, and PARED elements that composed them) in order to avoid problems with multicollinearity.

4.10 Study 2: the SES investigation

An similar exploratory approach to SES was taken in study 2. The three exploratory steps to creating the study's SES variables are now briefly outlined.

First, a similar standardized and weighted SES variable was computed in study 2 using linear transformations. An example of the transformations undertaken can be seen in in the Appendix in Section A.1.4.

Second, an SES (Average Score) variable was computed using the same procedure in study 1. Again, because of the strong correlation between SES (Average score) and SE, where $r = 0.995$, $p < 0.01$, and in light of the extensive use of standardized and weighted variables in internationally-validated surveys such as PISA (2012), the SES (Average Score) variable was not considered for further analysis.

Third, an SES (Scaled) variable was constructed. It was again obtained through scale analysis of the HISEI, PARED, and HOMEPOS constructs. In order to raise the Cronbach's alpha from 0.631 (unstandardized) to 0.724 (unstandardized), 19 of the original 23 items measuring HOMEPOS, all of the PARED, and none of the HISEI items were retained.

In the end, only the SE and SS variables (as opposed to also using the HOMEPOS, HISEI, and PARED elements that composed them) were entered as predictors in study 2's regression analyses in order to avoid problems with multicollinearity. Correlations between the various SES variables in study 2 are shown in the Appendix, Table A.2.

4.11 Criterion variables in studies 1 and 2

In study 1, results obtained in a single skill (Reading) were used to assess academic performance across the semester. Three indicators of performance were used: semester grades (SG), final exam grades (FE), and coursework grades (CW). It should be remembered that semester grades, because they were composed of mid-term exam results (not collected), coursework grades, and final exam results, were not independent of the other assessments. Coursework grades consisted of teacher-awarded, non-standardized grades. Final exam grades consisted solely of scores attained on a standardized exam.

In order to assess the reliability of the criterion variables used in study 1, correlational analysis was conducted. This revealed that the 2015 mid-term Reading exam was statistically significantly correlated with the 2015 final Reading exam, $r(166) = 0.456$, $p < 0.01$. Furthermore, item analysis of the mid-term Reading exam, final reading (mock) exam, and final Reading exam using the Kuder-Richardson formula 20 (KR20) indicated the reliability of these exams was moderate to good, with reliability coefficients of 0.89, 0.78, and 0.65 respectively. The lower reliability co-efficient (of 0.65) may be partly explained by a printing error on the exam.

In study 2, four skills composed the English course undertaken by the students. These skills were: Listening, Grammar/Vocabulary, Reading, and Writing. Each skill was tested, generating its own mid-term, final exam, and coursework score. However, rather than examining student performance at the level of the four skills, academic performance was measured at the subject level (i.e., as a composite score composed of the scores from Writing, Reading, Listening, and Grammar/Vocabulary). This was felt to be consistent with the level at which the students were asked to reflect on the motivational resources at their disposal.

Academic performance in study 2 was measured in four ways. First, the mid-term exam scores for the four skills were averaged to produce a single, subject-level (standardized) mid-term exam score. Second, scores from the four final exams were averaged to produce a single, subject-level (standardized) final exam score. Third, performance across each of the skills was combined to generate a (non-standardized) coursework score. Fourth, performance in the standardized and non-standardized

assessments across all four skills was averaged to produce a single overall score, termed semester grade.

In order to assess the reliability of the criterion variables in study 2, correlational analysis was conducted. Results indicated that mid-term exam scores were strongly correlated with final exam scores, $r(80) = 0.73$, $p < 0.01$ (see Appendix, Table A.3). However, examination of the correlations between the mid-term exam scores and final exam scores in each of the four sub-skills that composed the averaged mid-term and final exam scores for Group 1 revealed that although the Listening, Grammar/Vocabulary, and Writing mid-term and final exams were statistically significantly correlated, the Reading exams were not. Specifically, the correlation between the mid-term and final Listening exams was $r(80) = 0.544$, $p < 0.01$, the correlation between the mid-term and final Grammar/Vocabulary was $r(80) = 0.474$, $p < 0.01$, and the correlation between the mid-term and final Writing was $r(80) = 0.759$, $p < 0.01$; but the correlation between the Reading mid-term exam and the Reading final exam was $r(80) = 0.177$, $p > 0.05$.

Analysis of the Reading mid-term exam results for a parallel group in the following Spring semester indicated that this exam's reliability was somewhat weak too, with a KR(20) coefficient of 0.54. Analysis of the subsequent final Reading exam indicated that the exam was moderately reliable, with a KR(20) coefficient of 0.78. Once again the correlation between mid-term and final exam scores was not statistically significant, $r = 0.313$, $p = 0.12$.

Because of the relatively weak correlation between the mid-term and final Reading exams, a further set of criterion variables for study 2 was created; namely, mid-term exam score minus Reading (MID-R), final exam score minus Reading (FE-R), and semester grades minus Reading SG-R). However, correlational results (see Appendix, Table A.3) indicated that these variables were all highly correlated to those that did include Reading scores. For instance, the correlation between FE-R and FE was large, where $r = 0.96$, $p < 0.01$. Similarly, SG-R and SG were highly correlated, where $r = 0.99$, $p < 0.01$. Nevertheless, Reading scores (from the mid-term and final exams) were and were not included as part of the study 2's criterion variables in order to ascertain the extent to which relations with the study's predictor variables

varied as a function of retaining and not retaining Reading scores (see Appendix, Section B.1 for correlation results).

4.12 A comparison of groups

A number of students did not complete the questionnaires in study 1 and study 2 or did not provide full academic performance data. As a consequence, a number of mean-difference effect size analyses were conducted to investigate whether the non-inclusion of these students represented a threat to the generalizability of the current study to other cohorts embarking on the same course.

Results from the mean-difference effect size analyses completed in study 1 (see Appendix, Section A.3.1) indicated that the parental job status of students in Group 1 was significantly higher that that of Group 2. In addition, the academic performance of students in Group 1 (as measured by semester grades and coursework) was significantly higher than that of Group 3 (N = 36). The possibility thus arises that had Group 3 students been present when the survey was administered, their academic performance might have altered the relationship between academic performance and the study's predictor variables. This result impacts the generalizability of study 1's results.

In study 2, a series of standardized mean-difference effect size analyses were conducted (see Appendix, Section A.3.2). Few statistically significant differences were found between groups. Indeed, standardized mean effect size analysis indicated that only Group 1's coursework scores were statistically significantly higher than Group 3's. Had students from Group 3 (N = 16) completed the questionnaires at Time 2, the current results suggest that the relationship between coursework scores and the study's predictor variables may have been altered. This result impacts the generalizability of study 2's results.

4.13 Missing data

As missing data on the questionnaire might have been missing in a systematic way, an investigation of missingness (that is, the propensity to submit a data set with missing data in it) was performed. Results indicated that gender in both studies was a significant predictor of missingness. Further details of missingness are given in Appendix, Section A.4.

4.14 Imputation of data

Both study 1 and study 2 data sets were incomplete. In order to address this issue, data was imputed. In keeping with the exploratory nature of the current study, subsequent analysis differentiates between results obtained from the imputed and non-imputed data. Although data could have been imputed for items missing from the psychological variables, the extent of the missing data from any one measure, (maximally 0.6 per cent in study 1 and 1.3 per cent for one measure in study 2), was considered trivial and non-imputed psychological measures were retained for both studies. In other words, the imputation procedure was principally directed towards imputing data missing from the prior knowledge and SES constructs.

4.14.1 Study 1 data imputation

As approximately 92 per cent of all participants in Study 1 (Group 1) did not provide a TOEFL score, this variable was removed from all further analysis. Analysis of missing data patterns after the removal of the TOEFL score variable for Group 1 participants indicated that approximately 1 per cent of all possible values (and 53 per cent of all possible cases) were found to have incomplete data in Group 1. The variable with the next largest number of missing values (39 per cent) was HSGPA (English). This, however, was retained as a predictor, as was the variable with the next greatest number of missing values, which was HSGPA (All subjects) with approximately 12 per cent of values missing. Thereafter, the questions that composed the SES variables, which had less than 6 per cent missing values, were

the variables with most missing data. In order to address the problem of missing data, a multiple imputations procedure was conducted using SPSS. First, a random seed was set in order to generate a random number of iterations that would be used by SPSS in the multiple imputation procedure. Then the multiple imputation procedure was run.

4.14.2 Study 2 data imputation

In study 2 (Group 1), approximately 76 per cent of the participants did not provide a TOEFL score, and 64 per cent of participants did not provide an IELTS score. Consequently, the TOEFL and IELTS scores were not included as predictors. The variable with the next greatest percentage of missing data was GPA (All subjects) with 48 per cent. This too was removed as a predictor. Once again, analysis showed that the extent of data missing from the psychological variables was small. A random seed was set in order to generate a random number of iterations that would be used by SPSS for the multiple imputation procedure; then the imputation procedure was run.

4.15 Sample size, statistical power, and p-values

Access to participants rather than considerations of statistical power was the decisive factor in determining sample size. Specifically, sample size was driven by the number of teachers who were approached and who agreed to allow data to be collected from their students. Nevertheless, it is recognized that adding more predictors would have meant even less precision in estimating effects. Because of the number of comparisons made, statistical significance was set at $p \leq 0.01$ rather than 0.5. Arguably, this should have been even higher with the relevant Bonferroni correction applied. However, the current study was interested not only in statistical significance (and the dichotomy between 'important and not important' it entails), but also in the sizes of correlation and regression co-efficients, which may not have reached statistical significance but which may have been important nonetheless. In practice, greater reliance was put upon results whose non-marginal effects were consistent

across studies, sets of assumptions, and times. In other words, statistical significance was just one means of assessing the importance of a result.

4.16 Statistical procedures and plan of analysis

In an effort to meet with suggestions regarding best practice in the use of these statistics (Fidler, 2002; Wilkinson, 1999), the data was examined for assumptions of normality. Results are described more fully in the Appendix, Section A.6. As the current study was concerned about the effects of removing/retaining outliers, imputing/not imputing missing values, and making pairwise/listwise deletions, correlations across eight sets of assumptions were examined. These sets of assumptions (and the sensitivity analysis performed) are described in Chapter 5, Section 5.2.

The current study was also interested in change. The growth (or decline) in an individual's motivational resources has been shown to be important for academic achievement (Black & Deci, 2000). Change also lies at the heart of SDT, with the concepts of internalization and integration of external values making SDT a dynamic theory of human growth and development (Ryan & Deci, 2000). Hence, study 2 measures the changes in an individual's psychological resources over the period of the semester by subtracting the Time 1 value from the Time 2. Measuring change in this way is, however, not unproblematic. For instance, Lord (1956) argued that such 'difference between' scores were more unreliable than 'non-difference' scores because of the increase in measurement error associated with the former. In addition, although Willett (1988) advocates the use of such 'difference between' measures, growth (or decline) may not be smooth and continuous (p. 350). If it is not, it follows that more than the two waves of data collection in study 2 would be required to better understand change trajectories.

4.17 Linear regression issues

According to Field (2009; 2012) and Williams, Grajales, and Kurkiewicz (2013) a number of checks on data (both observed values and residual terms) must be made

to ensure that linear multiple regression analysis can be conducted successfully. The results of these checks are presented in the Appendix, Section A.6). Although coursework results in study 1 showed significant skew and kurtosis, the correlation and regression results obtained when the variable was transformed showed little substantive change (see Appendix, Section A.6.1).

4.18 Ethical clearance and issues

Ethical clearance from Durham University's Ethics Committee to conduct the study was sought and obtained, as was permission from the Director of the University's Preparatory Program in which the participants were enrolled.

With the permission of the program's director, teachers of Skills and Foundation One students were approached and asked if they would be willing to allow their students to take part in the study. Next, students were visited, provided with an oral overview of the research, given a written standardized introduction that outlined the study's purpose, assured that participation was not compulsory, and invited to participate. Willing participants then signed the permission sheet and completed the questionnaires. The entire process took approximately 30-40 minutes.

In all of the classes that took part in studies 1 and 2, I was present. Students were invited to participate, told that the information they provided would remain confidential, and assured that if they did not want to participate, they could leave the class and that no penalty would be incurred. All of the students elected to stay. No reward was offered. The students were then presented with the questionnaire pack and invited to read and sign the declaration inside. Once that had been signed, students proceeded to answer the questions in questionnaire pack. Upon completion, the students returned the pack and left the class.

4.18.1 Ethical issues

The current study's ethical approach is informed by the APA's general principles, by the guidance and advice of Durham University's Ethics Committee, and by my own beliefs and judgement about what is and is not ethical (Pring, 2001). Hence,

the approach herein recognizes both desirability and obligation as reasons for ethical action.

4.18.2 Obtaining informed consent

Durham University's School of Education Ethics Committee provided ethical clearance for the current research project. In accordance with this consent, participants were provided with a participant information sheet outlining the project's objectives, its data management procedures, and its reporting strategies. In addition, willing participants were also provided with a consent form. Permission to conduct the studies was granted by the Director of the Language Program.

4.18.3 Remaining open and honest

The project's objectives were explained to participants. An opportunity to ask questions (both at the beginning and the end of the data collection period) was given. Any questions that the participants had about the project were answered. Students were provided with a timeline for the current research project's completion, reminded of my contact email address, and invited to contact me in order to be sent a copy of the final thesis document.

4.18.4 Respecting the participants

Participants were informed that participation in the study was not compulsory and that non-participation would incur no penalties. Furthermore, participants were assured that they had the right to withdraw their participation at any time or decline to answer any of the questions in the questionnaires. Conversely, students were also advised that there were no rewards available for participation.

4.18.5 Ensuring confidentiality

A verbal assurance of confidentially was given in addition to the written assurance (in the consent form). Participants were assured that the data they provided would be held securely, would be confidential, and would not be used to identify individuals.

Although students were asked to provide their university student ID numbers (so that the grade they had attained could be assessed), these ID numbers were used for this purpose only. Again, permission was sought to access their grades (which are in fact available to any teacher).

4.19 A summary of the instruments used in the current studies

With the exception of prior performance indicators, the instruments employed in study 1 and study 2 were identical. These are summarized in Table 4.3 below.

Table 4.3: Instruments used in the current study

Name	Items	Likert	Constructs
Aspirations Index	30	1-7	MA
Self-Regulation Questionnaire (Academic)	32	1-4	AU, CO
Perceived Competence for Learning	4	1-7	PC
PISA student background questionnaire (HOMEPOS = 23, PARED = 4, HISEI = 2)	29	-	SE, SS, FC

The predictors and their abbreviations in the current study are: 1. Socio-Economic Status: a) SES standardized and weighted (SE) and b) Scaled (SS); 2. Generation: First and continuing generation students (FC); 3. Prior performance: self-reported IELTS exam score (IE)*, GPA (English) score (GE), and GPA (All subjects) score (GA)*; 4. Gender (GN); 5. Motives: autonomous (AU) and controlled (CO); 6. Perceived competence (PC); 7. Materialism (MA)

* Only used in study 1

Chapter 5

Results

5.1 Organization

The current chapter presents scale analysis results, descriptive statistics, correlation results, and regression results (in that order) for the Skills students in study 1 and the Foundation students in study 2. As a reminder, in study 1, the Skills students had obtained an overall Band 5 in IELTS, but were required to take a single-semester course in Reading because they had not obtained the minimum required score in that skill. The relationship that the study's predictor variables had with academic achievement in this single skill, Reading, was the subject of the investigation in study 1. In study 2, the Foundation students had not obtained an overall Band 5 in the IELTS exam and faced perhaps one, or possibly two, additional semesters in the language program. Unlike the Skills students who had nine hours of English tuition per week, the Foundation students had 25. In addition, in study 2, academic achievement was an aggregated measure of performance across four skills (Reading, Writing, Listening/Speaking, Grammar/Vocabulary).

However, in both studies, the criterion variables were coursework scores, final exams, and semester grades. Mid-term exam scores were an additional criterion variable in study 2 only. Semester grades were a summative score consisting of mid-term, coursework, and final exam results. Statistical significance in both studies was set at the level of $p \leq 0.01$. Interpretation and discussion of this chapter's results will be presented in Chapter 6.

5.2 Sensitivity analysis

In addition to the main data set (in which no missing values were imputed, no outliers were removed, and pairwise comparisons were made), separate analyses under different sets of assumptions were also conducted so that the effects of removing outliers, imputing data, and making listwise comparisons on correlational results could be known. Details of these separate sets of analyses with their differing sets of assumptions are given in Table 5.1. Throughout the discussion of results in Chapter 6, reference is made to results obtained from these different sets of assumptions.

Table 5.1: Sets of assumptions for separate analyses

Set	Imputed or non-imputed	Outliers	Deletion
1.	Non-imputed	With	Pairwise
2.	Non-imputed	With	Listwise
3.	Non-imputed	Without	Pairwise
4.	Non-imputed	Without	Listwise
5.	Imputed	With	Pairwise
6.	Imputed	With	Listwise
7.	Imputed	Without	Pairwise
8.	Imputed	Without	Listwise

5.3 Study 1

The reporting of study 1's results begins with scale analysis. Further details of the instruments used are given in Chapter 4 and in Table 4.3.

5.3.1 Scale analysis for study 1

In study 1, instruments to measure perceived competence, intrinsic aspirations, extrinsic aspirations, autonomous motives, and controlled motives were examined for reliability using Cronbach's alpha. The results are given in Table 5.2 below.

Table 5.2: Scale reliabilities in study 1

Variable	Instrument	No. of Items	Cronbach's alpha (α)
PC	Perceived Competence Scale	4	0.868
AI (Intrinsic)	Aspirations index	15	0.810
AI (Extrinsic)	Aspirations index	15	0.889
MA	Aspirations Index	5	0.833
AU	SRQ-A	16	0.868
CO	SRQ-A	16	0.771

5.3.2 Descriptive statistics for study 1

Table 5.3 below presents a summary of study 1's predictor and criterion variables. As can be seen, the variable with the greatest number of missing values was GPA (English), where 64 participants provided no information.

Table 5.3: Descriptive statistics for study 1

Variable	Number	Minimum	Maximum	Mean	SD
SE	162	20.55	92.50	74.73	18.90
SS	166	1.21	2.42	2.01	0.254
GA	146	72	100	89.88	6.05
GE	102	68	100	89.88	6.05
IE	163	5	7	5.17	0.294
AU	166	2.07	4	3.22	0.465
CO	166	1.94	4	3.11	0.384
PC	166	3.75	7	6.07	0.87
MA	166	-3.45	1.30	-0.82	0.86
FE	166	20	83	55.27	13.33
SG	166	28	88	66.33	10.41
CW	166	25	100	78.64	11.56

SE = Socio-Economic Status (Standardized and weighted), SS = Socio-Economic Status (Scaled), GA = Grade Point Average for all school subjects, GE = Grade Point Average for English only, IE = IELTS exam result, AU = Autonomous motives, CO = Controlled motives, PC = Perceived competence, MA = Materialism, FE = Final exam, SG = Semester grades, CW = Coursework

5.3.3 Correlational results for study 1

The correlational results for the main data set are now presented in table 5.4. Results from the full set of separate analyses are shown in Appendix, Section B.1.2.

Table 5.4: Study 1: correlational results (Non-imputed, with outliers, pairwise deletion)

	GN	SS	SE	IE	GE	GA	AU	CO	MA	PC	CW	FE	SG	CF
GN	-													
SS	-0.22**													
SE	-0.01	0.34**												
IE	-0.01	0.01	0.17*											
GE	-0.13	0.11	0.30**	0.27**										
GA	0.04	-0.03	0.12	0.09	0.43**									
AU	-0.04	0.11	-0.05	-0.01	0.09	0.02								
CO	-0.08	0.07	0.03	0.04	0.06	-0.05	0.36**							
MA	0.25**	-0.07	0.01	0.03	-0.11	-0.19*	-0.28**	0.04						
PC	-0.03	0.22**	-0.02	-0.08	0.08	0.12	0.34**	0.15	-0.24**					
CW	-0.39**	-0.18*	-0.07	0.08	0.17	0.12	0.00	0.14	-0.15	0.05				
FE	0.02	-0.19*	-0.05	0.27**	0.21*	0.24**	-0.08	0.02	-0.01	0.05	0.32**			
SG	-0.19*	-0.25**	-0.05	0.22**	0.27**	0.29**	-0.02	0.07	-0.1	0.08	0.68**	0.86**		
FC	0.21**	-0.04	0.28**	0.09	0.09	-0.01	-0.1	-0.05	0.05	-0.11	-0.03	-0.02	0.00	-

*$p < 0.05$, two-tailed; **$p < 0.01$, two, tailed, GN = Gender SS = Socio-Economic Status (Scaled) SE = Socio-Economic Status (Standardized and weighted) IE = IELTS GE = GPA (English) GA = GPA (All subjects) AU = Autonomous motives CO = Controlled motives MA = Materialism PC = Perceived competence CW = Coursework FE = Final exams SG = Semester grade FC = First or continuing generation

5.3.4 Regression analyses results for study 1

In order to better understand the roles the variables hypothesized to predict academic achievement in the current study played, a series of Entry-method multiple regression analyses were performed. Three regression models were created. In model 1, all the study's predictors were included. In model 2, the relationship that the psychological variables (only) had with the criterion variables was examined. In model 3, the most parsimonious regression model was created by maximising R^2 $_{\text{Adjusted}}$. The relationship between the current study's predictor variables and coursework, mid-term exams, final exams, and semester grades in study 1 are reported (in that order). Results revealed that none of the overall model 2 analyses predicted a statistically significant amount of variance for any of the criterion variables and in no model 2 was any psychological variables's individual regression coefficients statistically significant. In study 1 (and 2) males were coded as '1' and females as '0'.

Finally, as the study was most interested in results from its model 3 analyses, these are reported in full. Details of the other models can be found in the Appendix, Section B.2).

Coursework

The first criterion variable to be predicted was coursework. This consisted of the grades that were awarded by teachers for the students' participation in class and for the assignments and quizzes students completed for Reading only. In model 1 (see Appendix, Table B.56), all the predictor variables were entered into the regression analysis. The criterion variable was coursework. Model 1 explained a statistically significant amount of the variance in the grades participants achieved for coursework, ($F(11, 81) = 4.264$, $p < 0.01$, $R^2 = 0.367$, R^2 $_{\text{Adjusted}} = 0.281$). Examination of the regression coefficients in the model indicated that none of the psychological variables statistically significantly predicted the criterion variable. However, gender was a statistically significantly negative predictor of coursework (β = -0.484, $p < 0.001$), as was SES (Scaled) (β = -0.304, $p = 0.002$). See Appendix, Table B.57 for model 2 results.

In model 3, additional analyses were conducted with the aim of maximizing R^2

$_{\text{Adjusted}}$. For the full results, see Table 5.5. Analysis indicated that model 3 explained a statistically significant amount of variance in coursework scores ($F(6, 95) = 8.767$, $p < 0.001$, $R^2 = 0.356$, $R^2_{\text{Adjusted}} = 0.316$). Examination of regression coefficients revealed that only gender (β = -0.506, $p < 0.001$) and SES (Scaled) (β = -0.325, $p < 0.001$), statistically significantly predicted coursework.

Table 5.5: Study 1, model 3. Coursework

Variable	B	Std. Error	β	t	Sig.
(Constant)	80.337	18.978	-	4.233	0.000
GN	-13.389	2.233	-0.506	-5.995	0.000
SS	-15.404	4.093	-0.325	-3.763	0.000
GE	0.295	0.172	0.143	1.712	0.090
AU	-4.961	2.637	-0.183	-1.881	0.063
CO	4.398	3.072	0.133	1.432	0.156
PC	1.414	1.312	0.094	1.078	0.284

N = 102
GN = Gender, SS = Socio-Economic Status (Scaled), GE = Grade Point Average for English only, AU = Autonomous motives, CO = Controlled motives, PC = Perceived competence

Final exam

The next criterion variable to be predicted was final exam. For study 1, this consisted of a single standardized test for Reading only. In model 1 (see Appendix, Table B.58, all the predictor variables were entered into the regression analyses. The model did not explain a statistically significant amount of the variance in the participants' final exam grades ($F(11, 81) = 2.065$, $p < 0.05$, $R^2 = 0.219$, $R^2_{\text{Adjusted}} = 0.113$). Examination of the regression coefficients in the model indicated IELTS was a statistically significant predictor ($\beta = 0.339$, $p = 0.002$). See Appendix, Table B.59 for model 2 results.

Model 3 was constructed with the objective of maximizing R^2_{Adjusted} (see Table 5.6). The model explained a statistically significant amount of variance in final exam scores, $F(5, 92) = 5.867$, $p = 0.001$, $R^2 = 0.242$, $R^2_{\text{Adjusted}} = 0.201$. Examination of the regression coefficients revealed that only IELTS statistically significantly predicted final exam ($\beta = 0.356$, $p < 0.\ 001$).

Table 5.6: Study 1, model 3. Final exam

Variable	B	Std. Error	β	t	Sig.
(Constant)	-17.232	26.312	-	-0.655	0.514
SS	-9.349	5.019	-0.181	-1.863	0.066
SE	-0.120	0.068	-0.181	-1.773	0.080
IE	15.440	4.188	0.356	3.687	0.000
GE	0.411	0.212	0.189	1.936	0.056
AU	-4.637	2.691	-0.159	-1.723	0.088

N = 98
SS = Socio-Economic Status (Scaled), SE = Socio-Economic Status (Standardized and weighted), IE = IELTS exam score, GE = Grade Point Average for English only, AU = Autonomous motives

Semester grades

The final criterion variable to be predicted was semester grades. In study 1, this consisted of all scores (coursework, mid-term exam, which is not shown, and final exam) for Reading only. In model 1 (see Appendix, Table B.60), all the predictor variables were entered into the regression analyses. The criterion variable was semester grades. Model 1 explained a significant amount of the variance in semester grades, $F(11, 81) = 3.419$, $p < 0.001$, $R^2 = 0.317$, $R^2_{\text{Adjusted}} = 0.224$. Examination of the regression coefficients in the model indicated only gender (β = -0.291, $p = 0.\ 004$), and SES (Scaled) (β = -0.302, $p < 0.\ 004$), were statistically significant predictors. See Appendix, Table B.61 for model 2 results.

Model 3 was constructed with the objective of maximizing R^2_{Adjusted} (See Table 5.7). Model 3 explained a statistically significant amount of the variance in semester grades ($F(5, 95) = 9.075$, $p < 0.001$, $R^2 = 0.323$, R^2 Adjusted = 0.288). Gender (β = -0.270, $p = 0.\ 002$), SES (Scaled) (β = -0.355, $p < 0.001$), and GPA (English) (β = 0.230, $p \leq 0.01$) were statistically significant predictors in this model.

5.4 Study 2

The reporting of study 2's results begins with scale analysis. Further details of the instruments used are given in Chapter 4 and in Table 4.3. Next, the correlational and regression results for the non-change variables at Time 1 and then Time 2 are given, followed by the results for the change variables.

Table 5.7: Study 1, model 3. Semester grades

Variable	B	Std. Error	β	t	Sig.
(Constant)	37.130	19.134	-	1.940	0.055
GN	-5.942	1.906	-0.270	-3.118	0.002
SS	-14.140	3.478	-0.355	-4.066	0.000
IE	7.101	2.999	0.209	2.367	0.020
GE	0.395	0.151	0.230	2.606	0.011
AU	-3.726	1.952	-0.166	-1.908	0.059

N = 101
GN = Gender, SS = Socio-Economic Status (Scaled), IE = IELTS exam result, GE = Grade Point Average for English only, AU = Autonomous motives

5.4.1 Scale analysis for study 2

In study 2, instruments to measure perceived competence, intrinsic and extrinsic aspirations, and autonomous and controlled motives were again examined for reliability using Cronbach's alpha at both Time 1 and 2 (see Table 5.8 and 5.9 respectively). Although both study 1 and study 2 made use of the Aspirations Index, study 2, because of an error discovered in the data files after all the analyses had been run, used a slightly shortened version of the instrument.

Table 5.8: Scale reliability results for study 2, Time 1

Variable	Instrument	No. of items	Cronbach's alpha (α)
PC	Perceived Competence scale	4	0.888
AI (Intrinsic)	Aspirations Index	15	0.865
AI (Extrinsic)	Aspirations Index	15	0.917
MA	Aspirations Index	5	0.815
AU	SRQ-A	16	0.906
CO	SRQ-A	16	0.773

Specifically, four questions were not included in the analyses at Time 2 in that study. Two of these questions pertained to intrinsic aspirations and two to extrinsic aspirations. However, the two extrinsic aspirations were not part of the standard materialism measure; hence, the materialism measure at Time 2 lacked only two questions, both of which concerned intrinsic aspirations.

As the Cronbach's alphas are consistently high at both Time 1 and Time 2 and as the results obtained using the slightly shortened materialism measure at Time 2 are consistent with those obtained in study 2 at Time 1, the error was not rectified.

Table 5.9: Scale reliability results for study 2, Time 2

Variable	Instrument	No. of items	Cronbach's alpha (α)
PC	Perceived Competence scale	4	0.888
AI (Intrinsic)	Aspirations Index	13	0.91
AI (Extrinsic)	Aspirations Index	15	0.905
MA	Aspirations Index	5	0.796
AU	SRQ-A	16	0.906
CO	SRQ-A	16	0.773

5.4.2 Descriptive statistics for study 2

Table 5.10 presents a summary of study 2's predictor and criterion variables. This table includes both the non-change psychological variables at Time 1 and Time 2; for instance, AU1 and AU2, and the change psychological variables; for instance, AU (T2-T1).

Table 5.10: Descriptive statistics for study 2

Variable	Number	Minimum	Maximum	Mean	SD
SE	76	27.18	98.57	76.449	18.527
SS	80	1.65	2.78	2.325	0.287
GE	73	50	98	85.63	7.861
CO1	80	2.17	3.89	3.054	0.44
AU1	80	1.71	4	3.25	0.541
PC1	80	3.5	7	5.975	0.927
MA1	80	-3.39	1.11	-0.44	0.894
CO2	80	1.22	3.72	2.905	0.474
AU2	80	1.43	4	3.154	0.543
PC2	80	1.5	7	6.013	1.073
MA2	80	-3.44	1.33	-0.581	0.98
CO (T2-T1)	80	-1.39	0.72	-0.163	0.353
AU (T2-T1)	80	-2.36	0.86	-0.096	0.406
PC (T2-T1)	80	-5	2	0.038	0.946
MA (T2-T1)	80	-2.39	3.61	-0.141	0.831
MID	80	50.75	93.5	76.497	8.977
CW	80	61.25	93.25	78.766	7.288
FE	80	50.75	93	67.7943	9.015
SG	80	54.33	92.58	74.352	7.541

SE = Socio-Economic Status (Standardized and weighted), SS = Socio-Economic Status (Scaled), GE = Grade Point Average for English only, 1 = Time 1, 2 = Time 2, AU = Autonomous motives, CO = Controlled motives, PC = Perceived competence, MA = Materialism, T2-T1 = the value at Time 2 minus the value at Time 1, MID = Mid-term exam, CW = Coursework, FE = Final exam, SG = Semester grade

5.4.3 Correlational results for study 2

The correlation results are separated into five divisions. The first division (see Table 5.11) shows Time 1 predictors and Time 1 criterion variables, where the criterion variable was mid-term exam (with and without Reading results). The second division (see Table 5.12) shows Time 2 predictors with Time 2 criterion variables (again, with and without Reading results). The third division (see Table 5.13) shows Time 1 psychological variables with Time 2 criterions (with and without Reading). The fourth division (see Table 5.14) shows Time 1 and Time 2 psychological variables only. The fifth division (see Table 5.15) shows the change predictor variables and the study's criterion variables. Although only results from the main data are shown in this chapter, results for all eight separate analyses are shown in the Appendix (see Appendix, Section B.1.3). The correlations shown in this section are pairwise and two-tailed.

5.4.4 Details of the regression procedures in study 2

In order to determine the relationship between the current study's non-change predictor variables and academic achievement, a series of Entry-method multiple regression analyses were performed. Three models were constructed: model 1 used all the predictor variables; model 2 used only the psychological predictor variables; and models 3a and 3b were an attempt to create as parsimonious a model as possible with the objective of maximizing R^2_{Adjusted}. Model 3a did not include mid-term exam scores, whereas Model 3b did. Similar to results in study 1, the model 2 results in study 2 revealed that none of the overall models predicted a statistically significant amount of variance for any of the criterion variables and in no model 2 was any psychological variable's individual regression coefficient statistically significant.

For mid-term results, the psychological predictors come from Time 1, whereas for coursework, final exam, and semester grades, the psychological variables are taken from Time 2. For semester grades, a Model 3b was not constructed because semester grades are not independent of mid-term scores. Again, statistical significance for regression was set at $p \leq 0.01$.

Table 5.11: Correlation results for Division 1 (Time 1, non-imputed, with outliers)

	GN	IE	GA	GE	SE	SS	PC1	CO1	AU1	MA1	MID	MID-R
GN	-											
IE	0.15											
GA	-0.09	0.47										
GE	-0.26*	-0.06	0.2									
SE	-0.38**	-0.35	0.05	0.04								
SS	-0.26*	-0.15	-0.05	0.12	0.45**							
PC1	-0.15	0.23	0.15	-0.09	-0.15	0.01						
CO1	-0.30**	-0.02	0.29	0.02	0.12	0.04	0.12					
AU1	-0.18	0.08	0.35*	0.03	-0.04	-0.07	0.18	0.52**				
MA1	-0.02	-0.11	-0.01	0.19	-0.04	-0.08	-0.19	0.12	-0.11			
MID	-0.01	0.1	0.35*	-0.16	0.05	-0.18	0.23*	-0.04	-0.08	0.09		
MID-R	-0.01	0.16	0.37*	-0.15	0.06	-0.23*	0.21	-0.08	-0.12	0.1	0.97**	-

*$p < 0.05$, two-tailed; **$p < 0.01$, two, tailed, pairwise, GN = Gender, IE = IELTS, GA = GPA (All subjects), GE = GPA (English), SE = Socio-Economic Status (Standardized and weighted), SS = Socio-Economic Status (Scaled), 1 = Time 1, PC = Perceived competence, CO = Controlled motives, AU = Autonomous motives, MA = Materialism, MID = Mid-term results, MID-R = Mid-term results minus reading

Table 5.12: Correlation results for Division 2 (Time 2, non-imputed, with outliers)

	GN	IE	GA	GE	SE	SS	PC2	CO2	AU2	MA2	CW	FE	SG	FE-R	SG-R	CF
GN	-															
IE	0.15															
GA	-0.09	0.47														
GE	-0.26*	-0.06	0.2													
SE	-0.38**	-0.35	0.05	0.04												
SS	-0.26*	-0.15	-0.05	0.12	0.45**											
PC2	-0.04	0.2	0.09	-0.02	-0.06	-0.02										
CO2	-0.19	-0.01	0.22	-0.13	0.15	0.03	-0.01									
AU2	-0.13	0.04	0.23	-0.06	-0.06	-0.15	0.22*	0.65**								
MA2	0.04	-0.26	-0.31*	0.02	-0.07	0.04	-0.08	-0.14	-0.36**							
CW	0.01	0.12	0.34*	0.19	-0.01	-0.18	0.16	-0.11	-0.02	-0.03						
FE	-0.12	0.04	0.21	0.12	0.06	-0.12	0.12	-0.22*	-0.27*	0.09	0.68**					
SG	-0.05	0.09	0.34*	0.04	0.04	-0.18	0.17	-0.2	-0.2	0.06	0.86**	0.91**				
FE-R	-0.16	-0.02	0.21	0.18	0.1	-0.05	0.14	-0.29**	-0.32**	0.13	0.67**	0.96**	0.89**			
SG-R	-0.05	0.12	0.32*	0.06	0.05	-0.17	0.16	-0.23*	-0.2	0.05	0.87**	0.89**	0.99**	0.89**		
FC	-0.18	-0.18	0.26	0.2	0.38**	0.57**	0	-0.06	-0.04	-0.04	0.02	-0.01	-0.02	0.02	-0.03	-

*$p < 0.05$, two-tailed; **$p < 0.01$, two, tailed, pairwise, GN = Gender, IE = IELTS, GA = GPA (All subjects), GE = GPA (English), SE = Socio-Economic Status (Standardized and weighted), SS = Socio-Economic Status (Scaled), 2 = Time 2, PC = Perceived competence, CO = Controlled motives, AU = Autonomous motives, MA = Materialism, CW = Coursework, FE = Final exam, SG = Semester grades, -R = Minus reading grades, FC = Continuing and first generation students

Table 5.13: Correlation results for Division 3 (Time 1 predictors, Time 2 criterions, non-imputed, with outliers)

	PC1	CO1	AU1	MA1	CW	FE	SG	FE-R	SG-R
PC1	-								
CO1	0.12								
AU1	0.18	0.52*							
MA1	-0.19	0.12	-0.11						
CW	0.09	0.06	0.12	0.11					
FE	0.25*	-0.1	-0.19	0.08	0.68**				
SG	0.22	-0.04	-0.07	0.1	0.86**	0.91**			
FE-R	0.24*	-0.11	-0.17	0.13	0.67**	0.96**	0.89**		
SG-R	0.2	-0.05	-0.06	0.12	0.87**	0.89**	0.99**	0.89**	-

*$p < 0.05$, two-tailed; **$p < 0.01$, two, tailed, pairwise, PC = Perceived competence, CO = Controlled motives, AU = Autonomous motives, MA = Materialism, 1 = Time 1, CW = Coursework, FE = Final exam, SG = Semester grades, -R = Minus reading grades

As the regression analysis was conducted using a listwise procedure, and because 51 students did not provide an IELTS score and 38 did not provide an HSGPA (All subjects) score (with some overlap because some students provided neither), the inclusion of these variables saw the number of participants in the regression analyses fall from 80 to just 17. In order to avoid this, HSGPA (All subjects) and IELTS scores were excluded.

In addition to exploring the relationship that the non-change psychological resources predictor variables at Time 1 and Time 2 had with the study's criterion variables, a series of analyses were conducted using change variables. For the psychological variables, these change variables were computed using the formula T2 – T1. As a consequence, a higher score at Time 2 relative to Time 1 would see a positive value emerge, indicating a rise in that variable; in contrast, lower scores at Time 2 relative to Time 1 would see a negative value emerge, indicating a fall in that value of that variable.

In the case of materialism (in which a positive index indicates an increasingly materialistic orientation), a higher score at Time 2 relative to Time 1 might see a positive value emerge (or a less negative one), but would be indicative of an undesirable change from an SDT perspective (Kasser & Ryan, 1993, 1996).

Finally, as the study was most interested in results from its model 3a analyses, these are reported in full. Details of the other models can be found in the Appendix

Table 5.14: Correlation results for Division 4 (Time 1 and 2 predictors, Non-imputed, with outliers)

	GN	IE	GA	GE	SE	SS	PC1	PC2	CO1	CO2	AU1	AU2	MA1	MA2	CF
GN	-														
IE	0.15														
GA	-0.09	0.47													
GE	-0.26*	-0.06	0.2												
SE	-0.38**	-0.35	0.05	0.04											
SS	-0.26*	-0.15	-0.05	0.12	0.45**										
PC1	-0.15	0.23	0.15	-0.09	-0.15	0.01									
PC2	-0.04	0.2	0.09	-0.02	-0.06	-0.02	0.56**								
CO1	-0.30**	-0.02	0.29	0.02	0.12	0.04	0.12	0.14							
CO2	-0.19	-0.01	0.22	-0.13	0.15	0.03	-0.02	-0.01	0.73**						
AU1	-0.18	0.08	0.35*	0.03	-0.04	-0.07	0.18	0.24*	0.52**	0.38**					
AU2	-0.13	0.04	0.23	-0.06	-0.06	-0.15	0.06	0.22*	0.50**	0.65**	0.72**				
MA1	-0.02	-0.11	-0.01	0.19	-0.04	-0.08	-0.19	0.15	0.12	-0.18	-0.11	-0.19			
MA2	0.04	-0.26	-0.31*	0.02	-0.07	0.04	-0.11	-0.08	0.05	-0.14	-0.25*	-0.36**	0.61**		
FC	-0.18	-0.18	0.26	0.2	0.38**	0.57**	-0.04	0	-0.05	-0.06	0.03	-0.04	-0.01	-0.04	

*$p < 0.05$, two-tailed; **$p < 0.01$, two, tailed, pairwise, GN = Gender, IE = IELTS, GA = GPA (All subjects), GE = GPA (English), SE = Socio-Economic Status (Standardized and weighted), SS = Socio-Economic Status (Scaled), 2 = Time 2, PC = Perceived competence, CO = Controlled motives, AU = Autonomous motives, MA = Materialism, CW = Coursework, FE = Final exam, SG = Semester grades, -R = Minus reading grades, FC = Continuing and first generation students

Table 5.15: Correlation results for Division 5 (Motivational change predictors, Non-imputed, with outliers)

	GN	SE	SS	GE	AUT2-T1	COT2-T1	PCT2-T1	MAT2-T1	CW	FE	SG
GN	-										
SE	-0.38**										
SS	-0.26*	0.45**									
GE	-0.26*	0.04	0.12								
AUT2-T1	0.06	-0.03	-0.11	-0.11							
COT2-T1	0.14	0.03	-0.01	-0.20	0.49**						
PCT2-T1	0.10	0.09	-0.04	0.06	0.13	-0.00					
MAT2-T1	0.07	-0.04	0.13	-0.19	-0.04	0.11	-0.35**				
CW	0.01	-0.01	-0.18	0.19	-0.18	-0.24*	0.09	-0.15			
FE	-0.12	0.06	-0.12	0.12	-0.12	-0.21	-0.10	0.03	0.68**		
SG	-0.05	0.04	-0.18	0.04	-0.18	-0.25*	-0.02	-0.04	0.86**	0.91**	-

*$p < 0.05$, two-tailed; **$p < 0.01$, two, tailed, pairwise, GN = Gender, IE = IELTS, GA = GPA (All subjects), GE = GPA (English), SE = Socio-Economic Status (Standardized and weighted), SS = Socio-Economic Status (Scaled), T1 = Time 1, T2 = Time 2, AU = Autonomous motives, CO = Controlled motives, PC = Perceived competence, MA = Materialism, CW = Coursework, FE = Final exam, SG = Semester grades

(see Section B.2).

5.4.5 How study 2's regression results are presented

Results from regression analyses at Time 1, where non-change motivational resources and personal characteristics were the predictor variables, and where mid-term exam scores were the criterion variable, are presented first. The study moves on to report the relationships between its non-change predictor variables measured at Time 2 and its criterion variables: coursework, final exam, and semester grades. Finally, the current section reports the relationships between the changes in motivational resources (where changes in motivational resources were calculated as the value at Time 2 minus the value at Time 1) and the criterion variables of coursework, final exam, and semester grades.

As a reminder, in study 2 the mid-term exam criterion variable was a summation of scores from standardized mid-term exams in all the skills (Reading, Writing, Listening/Speaking, and Grammar/Vocabulary). Coursework was a summation of teachers' marks for participation and class work across all skills. The final exam was the summation of results across all skills in standardized final exams. Semester grades was the summation of all these indicators of academic achievement across all skills.

Time 1

The relationship between motivational resource variables measured at Time 1, the students' personal characteristics, and the mid-term exams is now reported. Mid-term exams were standardized and are one element composing semester grades.

Mid-term exam scores The first criterion variable to be predicted was mid-term exam scores. In model 1, (see Appendix, Table B.62), all the predictor variables, except IELTS scores and HSGPA (All), were entered into the regression analysis. The criterion variable was mid-term exam scores. Model 1 did not explain a statistically significant amount of the variance in the grades participants achieved for mid-term scores, $F(9, 59) = 1.751$, $p = 0.098$, $R^2 = 0.211$, $R^2_{\text{Adjusted}} = 0.090$. Examination

of the regression coefficients in the model indicated that none of the psychological variables at Time 1 statistically significantly predicted mid-term scores at the $p \leq 0.01$ level. See Appendix, Table B.63 for model 2 results.

In model 3, the results of which are shown in Table 5.16, a statistically significant amount of variance in mid-term scores was not explained, $F(6, 62) = 2.686$, $p = 0.022$, $R^2 = 0.206$, $R^2_{\text{Adjusted}} = 0.13$. Examination of the regression coefficients revealed that perceived competence statistically significantly predicted mid-term scores at Time 1, ($\beta = 0.3$, $p \leq 0.01$).

Table 5.16: Study 2, T1, model 3. Mid-term exam scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	92.390	15.940	-	5.796	0.000
SS	-10.238	4.181	-0.331	-2.449	0.017
SE	0.118	0.065	0.245	1.833	0.072
GE	-0.136	0.131	-0.122	-1.040	0.302
AU1	-2.204	1.926	-0.134	-1.144	0.257
MA1	1.553	1.127	0.163	1.378	0.173
PC1	3.033	1.184	0.300	2.561	0.013

N = 69
SS = SES (Scaled), SE = SES (Standardized and weighted), GE = GPA (English only), 1 = Time 1, AU = Autonomous motives, MA = Materialism, PC = Perceived competence

Time 2

The relationships between the study's non-change motivational resource variables measured at Time 2, the students' personal characteristics, and the study's other criterion variables are now reported. This begins with coursework.

Coursework scores The second criterion variable to be predicted was coursework scores. In model 1 (see Appendix, Table B.64), all the predictor variables, apart from IELTS scores and HSGPA (All), were entered into the regression analysis. Model 1 did not explain a statistically significant amount of the variance in coursework grades ($F(9, 59) = 1.438$, $p = 0.193$, $R^2 = 0.180$, $R^2_{\text{Adjusted}} = 0.055$). None of the regression coefficents were statistically significant at the $p \leq 0.01$ level. See Appendix, Table B.65 for model 2 results.

In model 3a, the results of which are shown in Table 5.17, a parsimonious regression model was constructed but without entering mid-term scores. Results revealed that the overall model did not predict a statistically significant amount of the variance in coursework scores, $F(4, 67) = 3.175$, $p = 0.019$, $R^2 = 0.159$, $R^2_{\text{Adjusted}} = 0.109$. Examination of the regression coefficients indicated that none of the correlation coefficients were statistically significant predictors at the $p \leq 0.01$ level.

Table 5.17: Study 2, T2, model 3a. Coursework scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	70.087	11.887	-	5.896	0.000
SS	-8.214	3.507	-0.334	-2.342	0.022
GE	0.176	0.102	0.197	1.719	0.090
PC2	1.323	0.754	0.198	1.754	0.084
FC	2.862	2.126	0.194	1.346	0.183

N = 72
SS = SES (Scaled), GE = GPA (English only), 2 = Time 2, PC = Perceived competence, FC = First and continuing students

In model 3b (see Appendix, Table B.66), a parsimonious regression model was constructed. This time, mid-term exam results were also entered. Results revealed that the overall model predicted a statistically significant amount of the variance in coursework scores, $F(4, 68) = 22.054$, $p < 0.001$, $R^2 = 0.565$, $R^2_{\text{Adjusted}} = 0.539$. GPA (English) was a statistically significant predictor, after controlling for mid-term exams, where $\beta = 0.353$, $p < 0.001$.

Final exam scores The third criterion variable to be predicted was final exam scores. In model 1, (see Appendix, Table B.67), all the predictor variables – with the exception of IELTS scores and GPA (All) – were entered into regression analysis. Model 1 did not explain a statistically significant amount of the variance in final exam scores, $F(9, 59) = 2.095$, $p = 0.044$, $R^2 = 0.242$, $R^2_{\text{Adjusted}} = 0.127$. Examination of the regression coefficients revealed that none of the predictor variables statistically significantly predicted final exam scores at the $p \leq 0.01$ level. See Appendix, Table B.68 for model 2 results.

In model 3a (see Table 5.18), a parsimonious regression model was constructed but without entering mid-term scores. Results revealed that the overall model pre-

dicted a statistically significant amount of the variance in final exam scores, F(6, 62) = 3.195, p = 0.008, R^2 = 0.236, R^2 $_{\text{Adjusted}}$ = 0.162. Autonomous motives (at T2), where β = -0.35, p = 0.004 was a statistically significant predictor of final exam scores.

Table 5.18: Study 2, T2, model 3a. Final exam scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	88.665	16.190	-	5.476	0.000
GN	-4.626	2.392	-0.249	-1.934	0.058
SS	-9.908	3.982	-0.330	-2.488	0.016
SE	0.044	0.065	0.093	0.666	0.508
GE	0.076	0.127	0.070	0.599	0.552
AU2	-5.465	1.823	-0.347	-2.999	0.004
PC2	1.833	0.922	0.226	1.989	0.051

N = 63
GN = Gender, SS = SES (Scaled), SE = SES (Standardized and weighted), GE = GPA (English only), 2 = Time 2, AU = Autonomous motives, PC = Perceived competence

In model 3b (see Appendix, Table B.69), a parsimonious regression model was again constructed but with mid-term scores entered. Results revealed that the overall model predicted a statistically significant amount of the variance in final exam scores, F(4, 64) = 21.355, $p < 0.001$, R^2 = 0.572, R^2 $_{\text{Adjusted}}$ = 0.545. Examination of the regression coefficients revealed that none of the predictor variables statistically significantly predicted final exam scores at the $p \leq 0.01$ level.

Semester grades The final criterion variable to be predicted was semester grades. Model 1 (see Appendix, Table B.70) did not explain a statistically significant amount of the variance in semester scores, F(9, 59) = 1.981, p = 0.058, R^2 = 0.232, R^2 $_{\text{Adjusted}}$ = 0.115. Examination of the regression coefficients indicated that only SES (Scaled) was a statistically significant predictor of semester grades. See Appendix, Table B.71 for model 2 results.

In model 3a, the results of which are shown in Table 5.19, a parsimonious regression model was constructed but without mid-term scores. The overall model predicted a statistically significant amount of the variance in semester grades, F(6, 62) = 2.971, p = 0.013, R^2 = 0.223, R^2 $_{\text{Adjusted}}$ = 0.148. Examination of the regres-

sion coefficients revealed that autonomous motives (at Time 2) and SES (Scaled) were statistically significant negative predictors of semester grades, where β = -0.303, $p = 0.012$, and where β = -0.363, $p = 0.009$ respectively.

Table 5.19: Study 2, T2, model 3a. Semester grades

Variable	B	Std. Error	β	t	Sig.
(Constant)	91.642	13.831	-	6.626	0.000
GN	-2.679	2.044	-0.171	-1.311	0.195
SS	-9.234	3.402	-0.363	-2.714	0.009
SE	0.050	0.056	0.126	0.890	0.377
GE	0.030	0.108	0.033	0.280	0.781
AU2	-4.046	1.557	-0.303	-2.598	0.012
PC2	1.875	0.788	0.273	2.380	0.020

N = 69
GN = Gender, SS = SES (Scaled), SE = SES (Standardized and weighted), GE = GPA (English only), 2 = Time 2, AU = Autonomous motives, PC = Perceived competence

No model 3b was produced as semester grades are a composite of mid-term scores. Having examined the relationships that the non-change variables have with the study's criterion variables, the results of the analyses using the change variables are now presented.

The 'change' predictor variables

Results are now presented showing the relationship that the change predictor variables – autonomous motivation (T2-T1), perceived competence (T2-T1), controlled motivation (T2-T1), and materialism (T2-T1) – have with coursework, final exam, and semester grades, beginning with coursework. Once again, three models are made use of.

Coursework scores The first criterion variable to be predicted was coursework scores. In model 1 (see Appendix, Table B.72), all the predictor variables were entered into the regression analysis. Model 1 did not explain a statistically significant amount of the variance in coursework scores, $F(9, 59) = 1.553$, $p = 0.151$, $R^2 = 0.192$, $R^2_{\text{Adjusted}} = 0.068$. Examination of the regression coefficients revealed that none of

the predictor variables statistically significantly predicted final exam scores at the $p \leq 0.01$ level. See Appendix, Table B.73 for model 2 results.

In model 3a, the results of which are shown in Table 5.20, a parsimonious regression model was constructed but without entering mid-term scores. Results revealed that the overall model predicted a statistically significant amount of the variance in coursework scores, $F(4, 67) = 3.386$, $p = 0.014$, $R^2 = 0.168$, $R^2_{\text{Adjusted}} = 0.118$. Examination of the regression coefficients revealed that only SES (Scaled) was a statistically significant predictor of coursework scores, where $\beta = -0.367$, $p \leq 0.01$.

Table 5.20: Study 2, T2-1, model 3a. Coursework scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	82.425	10.559	-	7.806	0.000
SS	-9.039	3.458	-0.367	-2.614	0.011
GE	0.129	0.104	0.144	1.238	0.220
CO2-1	-4.330	2.216	-0.223	-1.954	0.055
FC	3.431	2.108	0.232	1.627	0.108

N = 72

GN = Gender, SS = SES (Scaled), SE = SES (Standardized and weighted), GE = GPA (English only), 2 = Time 2, AU = Autonomous motives, PC = Perceived competence

In model 3b (see Appendix, Table B.74), a parsimonious regression model was again constructed but with mid-term scores added as a predictor. Results revealed that the overall model predicted a statistically significant amount of the variance in coursework scores, $F(3, 69) = 27.085$, $p < 0.001$, $R^2 = 0.541$, $R^2_{\text{Adjusted}} = 0.521$. Examination of the regression coefficients revealed that apart from mid-term results, only GPA (English) was a statistically significant predictor, where $\beta = 0.277$, $p = 0.002$.

Final exam scores The second criterion variable to be predicted was final exam scores. In model 1, (see Appendix, Table B.75), all the predictor variables were entered into the regression analysis. Model 1 did not explain a statistically significant amount of the variance in final exam scores, $F(9, 59) = 1.352$, $p = 0.231$, $R^2 = 0.171$, $R^2_{\text{Adjusted}} = 0.044$. Examination of the regression coefficients revealed that none of the predictor variables statistically significantly predicted final exam scores at the p

≤ 0.01 level. See Appendix, Table B.76 for model 2 results.

In model 3a, the results of which are shown in Table 5.21, a parsimonious regression model was constructed but without entering mid-term scores into the analysis. Results revealed that the overall model did not predict a statistically significant amount of the variance in final exam scores, $F(5, 63) = 2.327$, $p = 0.053$, $R^2 = 0.156$, $R^2_{\text{Adjusted}} = 0.089$. Examination of the regression coefficients revealed that none of the predictor variables statistically significantly predicted final exam scores at the $p \leq 0.01$ level.

Table 5.21: Study 2, T2-1, model 3a. Final exam scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	78.853	14.131	-	5.580	0.000
GN	-2.769	2.476	-0.149	-1.118	0.268
SS	-8.698	4.105	-0.290	-2.119	0.038
SE	0.059	0.068	0.127	0.869	0.388
GE	0.055	0.134	0.051	0.413	0.681
CO2-1	-5.715	2.790	-0.244	-2.049	0.045

N = 69
GN = Gender, SS = SES (Scaled), SE = SES (Standardized and weighted), GE = GPA (English only), 2 = Time 2, AU = Autonomous motives, PC = Perceived competence

In model 3b,(see Appendix, Table B.77), a parsimonious regression model was constructed. This time, mid-term scores were entered into the analysis. Results revealed that the overall model predicted a statistically significant amount of the variance in final exam scores, $F(4, 64) = 21.389$, $p < 0.001$, $R^2 = 0.572$, $R^2_{\text{Adjusted}} = 0.545$. Examination of the regression coefficients revealed that controlling for mid-term exam results, only GPA (English) statistically significantly predicted final exam results, where $\beta = 0.234$, $p = 0.006$.

Semester grades The final criterion variable to be predicted was semester grades. In model 1 (see Appendix, Table B.78), all the predictor variables were entered into the regression analysis. However, model 1 did not explain a statistically significant amount of the variance in semester grades, $F(9, 59) = 1.448$, $p = 0.189$, $R^2 = 0.181$, $R^2_{\text{Adjusted}} = 0.056$. Examination of the regression coefficients revealed that none of

the predictor variables statistically significantly predicted final exam scores at the $p \leq 0.01$ level. See Appendix, Table B.79 for model 2 results.

In model 3a, the results of which are shown in Table 5.22, a parsimonious regression model was constructed in order to predict semester grades, but without entering mid-term scores into the analysis. Results revealed that the overall model did not predict a statistically significant amount of the variance in semester grades, $F(4, 64) = 3.129$, $p = 0.021$, $R^2 = 0.164$, $R^2_{\text{Adjusted}} = 0.111$. Examination of the regression coefficients revealed that none of the predictor variables statistically significantly predicted final exam scores at the $p \leq 0.01$ level.

Table 5.22: Study 2, T2-1, model 3a. Semester grades

Variable	B	Std. Error	β	t	Sig.
(Constant)	85.577	10.777	-	7.940	0.000
SS	-8.494	3.435	-0.334	-2.473	0.016
SE	0.076	0.053	0.193	1.437	0.156
GE	0.021	0.108	0.023	0.192	0.848
CO2-1	-5.725	2.320	-0.289	-2.468	0.016

N = 69
SS = SES (Scaled), SE = SES (Standardized and weighted), GE = GPA (English only), 2 = Time 2, CO = Controlled motives

As for model 3b, this was not constructed because the variable semester grades is not independent of mid-term results.

Chapter 6

Discussion

6.1 Answering the research questions (RQs)

The current section addresses six main research questions. These were: 1. What is the relationship between the study's non-change motivational and personal characteristics variables? 2. What is the relationship between the personal characteristics variables and academic performance? 3. What is the relationship between the current study's non-change motivational resources variables and academic performance? 4. Are changes in motivational resources predictive of grades? 5. What is the relationship between generational status and academic performance? 6. What differences exist between the cohorts in study 1 and 2? An overview of the study's results is now given. This is followed by further discussion of its main findings.

6.1.1 Overview of the sensitivity analysis

As each research question is discussed, results from the sensitivity analysis are included. Generally, the direction of the correlation indicated across the sets of assumptions was consistent with that in the main data set. Where a correlational result was marginal in the main data set, it tended to be marginal across all the other sets of assumptions; conversely, where a correlation was statistically significant in the main data set (at the $p \leq 0.01$ level), it tended to remain so across the majority of sets. This provides some degree of confidence that the correlational results from the main data set were relatively robust and not dependent upon an

arbitrarily chosen set of assumptions.

6.1.2 Overview of key findings discussed in this chapter

As a reminder, the current study's criterion variables were mid-term exams (in study 2 only), coursework, final exam, and semester grades. Five main findings emerged from the correlation and regression analyses conducted.

First, four prominent predictors emerged: 1. SES (Scaled), which appeared as a negative predictor in every model 3 (i.e., all seven possible model 3 analyses). This variable also had the largest beta values in four of the seven regression model 3 analyses; 2. Autonomous motives, which appeared as a negative predictor in six out of seven possible model 3 analyses; 3. Gender, which appeared as a negative predictor in four out of seven model 3 analyses; 4. GPA (English), which appeared as a positive predictor in all seven model 3 analyses.

Second, approximately double the variance in achievement was predicted by the model 3 analyses in study 1 compared to those in study 2. For instance, in study 1 the overall model 3 for coursework scores predicted approximately 32% of variance, where $F(6, 95) = 8.767$, $p < 0.001$, $R^2 = 0.356$, $R^2_{\text{Adjusted}} = 0.316$. In contrast, in study 2, the overall model 3 for coursework predicted only 11% of variance, where $F(4, 67) = 3.175$, $p = 0.019$, $R^2 = 0.159$, $R^2_{\text{Adjusted}} = 0.109$.

Third, the greatest difference in model 3 regression results across study 1 and 2 pertained to the relationship between coursework scores and gender. Specifically, in study 1, gender was a strong predictor of coursework scores, where $\beta = -0.506$, $p < 0.001$, whereas it did not appear as a predictor of coursework in the revelant model in study 2. In fact, the beta value for gender in study 1 was the largest of all in the seven model 3 analyses.

Fourth, correlations between the various motivational resources were generally as expected. However, the exception was the strong correlation found between autonomous and controlled motives in study 2.

Fifth, correlational and regression analysis indicated that perceived competence was not an important predictor in study 1, but prior performance was. In contrast, perceived competence was an important predictor in study 2, but prior performance

was not.

These results are now explored in the following sections, which are organized with reference to the current study's research questions. Explanations for results obtained are then offered in Section 6.2 and implications for practice are examined in Chapter 7.

6.1.3 RQ1: How are the predictor variables inter-related?

First, relationships between the variables that compose the study's motivational (non-change) resources are reported. Next, the relationship the personal characteristics variables (SES, gender, and prior achievement) had with one another and with motivational resources are described.

The correlational relationships between the non-change motivational resources variables

The correlational relationships found in study 1 and study 2 generally matched expectations. Four main results were anticipated: 1. The correlation between autonomous motives and perceived competence would be positive and small, with a value approximating to 0.25 (as suggested in Section 3.2.1). Furthermore, the correlational relationship would be stronger than that between controlled motives and perceived competence; 2. The correlation between autonomous and controlled motives would be positive (as suggested in Section 3.2.2); 3. The correlation between autonomous motives and materialism would be small and negative (as suggested in Section 3.2.3). Furthermore, the correlational relationship between controlled motives and materialism would be small and positive; 4. The correlation between materialism and perceived competence would approximate to -0.24 (as suggested by Kasser *et al.*, 2014 in Section 3.2.4).

Autonomous motives and perceived competence The first of these expectations, that autonomous motives and perceived competence would be positively correlated, was met in both studies and in all of the sets. In study 1, the correlation between autonomous motives and perceived competence was statistically significant,

$r = 0.34$, $p < 0.01$, with a mean correlation across all eight sets equal to 0.323 indicated (see Appendix, Table B.8). This approximated to the size of correlation suggested in Section 3.2.1. In comparison, in study 2 at Time 1, the relationship was not as strong as expected, where $r = 0.18$, *ns*. Similarly, at Time 2, the relationship was less strong too, where $r = 0.22$, *ns*. Sensitivity analysis indicated a mean correlation value of 0.17 at Time 1 (see Appendix, Table B.19), and 0.21 at Time 2 (see Appendix, Table B.29).

In summary, in both study 1 and 2 at Time 1 and Time 2 (and thus in all 24 sets of assumptions), the correlational relationship between autonomous motives and perceived competence was positive and non-marginal (i.e., greater than 0.1). Such a result is consistent with CET (Vansteenkiste, Niemiec, & Soenens (2010) and a key SDT theoretical assumption; namely, that competence will be accompanied by autonomy. Further support for this theoretical position came from the finding that in no set within the current study was controlled motives more strongly correlated with perceived competence than autonomous motives. In summary, the expected positive relationship between autonomous motives and perceived competence was found in study 1 and, to a lesser extent, in study 2.

Autonomous and controlled motives The second expectation, that controlled and autonomous motives would be positively correlated, was also met. In study 1, the correlation was medium-sized, where $r = 0.36$, $p < 0.01$ (see Table 5.4), with the relationship remaining statistically significant across all assumptions, and with a mean correlation value of 0.385 indicated (see Appendix, Table B.8). In comparison, in study 2 at Time 1, the correlation was large, where $r = 0.52$, $p < 0.01$ (see Table 5.11), with the relationship remaining statistically significant across all assumptions, and with a mean correlation value of 0.511 indicated (see Appendix, Table B.20). At Time 2, this correlation was somewhat stronger, where $r = 0.65$, $p < 0.01$ (see Table 5.12), with the relationship statistically significant across all the sets of assumptions and with a mean correlation value of 0.6 indicated (see Appendix, Table B.31). In other words, the correlation between these two variables was stronger in study 2 than study 1.

In summary, although the direction of the correlation in both studies was as expected, the size of the correlation in study 2 was not. This finding is discussed further in Section 6.2.

Autonomous motives and materialism In Section 3.2.3, it was suggested that the relationship between autonomous motives and materialism would be negative and small. For instance, Black and Deci's (2000) results showed that the correlation at Time 1 between RAI and grade orientation was r = -0.25, $p < 0.01$.

In the current study 1, the correlation between these two variables was statistically significantly negative, where r = -0.28, $p < 0.01$ (see Table 5.4). Sensitivity analysis indicated that across all sets of assumptions, the relationship remained statistically significantly negative (see Appendix, Table B.8). The mean correlation value indicated was -0.289. In comparison, controlled motives and materialism were only marginally (i.e., less than 0.1) and non-statistically significantly correlated.

In study 2 at Time 1, although the correlation was negative, it was smaller than expected, where r = -0.11, *ns* (see Table 5.11). In addition, sensitivity analysis indicated that across all sets of assumptions the relationship remained negative but small (and only marginal in three out of eight sets), with a mean correlation value of -0.1 indicated (see Appendix, Table B.21). Sensitivity analysis also indicated that controlled motives were positively correlated with materialism across all sets of assumptions, albeit the relationship was small, with a mean correlation value of 0.144 indicated (see Appendix, Table B.20).

However, the relationship between autonomous motives and materialism in study 2 at Time 2 became statistically significantly negative, where r = -0.36, $p < 0.01$ (see Table 5.11). Sensitivity analysis (see Appendix, Table B.31) indicated that the mean correlation value was -0.341. In six out of eight sets, the relationship remained statistically significantly negative at the $p < 0.01$ level. In comparison, controlled motives and materialism were negatively correlated at Time 2, but not statistically significantly so in any set (see Appendix, Table B.30). In addition, the size of the correlation was marginal, with sensitivity analysis indicating that the mean correlation value was -0.073.

In summary, in both study 1 and study 2 materialism was negatively correlated with autonomous motives, often statistically significantly so. These findings generally accord with SDT theorising, which posits that materialistic goals tend to be pursued for less autonomous reasons (Kasser *et al.*, 2014).

Materialism and perceived competence The fourth expectation, that the correlation between materialism and perceived competence would be small and approximate to -0.24 (see Section 3.2.4) was met in study 1, but not at both times in study 2.

Specifically, in study 1, the correlation was r = -0.24, $p < 0.01$ (see Table 5.4). Sensitivity analysis indicated that across all sets materialism and perceived competence were statistically significantly negatively correlated at the $p < 0.01$ level, with a mean correlation value of -0.27 indicated (see Appendix, Table B.10).

In study 2, the relationship between materialism and perceived competence was again negative. At Time 1, the relationship was similar to that in study 1 (see Table 5.11), where r = -0.19, *ns*, with a mean correlation value of -0.17 indicated (see Appendix, Table B.19). At Time 2, the variables were marginally correlated (i.e., less than 0.1). Hence no table is shown. According to SDT, individuals who are more focused on growth and development (as indicated by a negative score for the materialism variable) would be expected to experience a greater sense of personal competence compared to those who place relatively less importance on need-satisfying aspirations.

In summary, in study 1 the relationship between materialism and perceived competence showed the expected strength and direction. The expected direction was also shown in study 2, but only Time 1 showed (approximately) the expected size.

The inter-relations between the personal characteristics variables and their relationship with the motivational resources variables

The inter-relations between the personal characteristics variables and their relationship with the motivational resources variables were a mix of the expected and unexpected. The following section begins with prior performance before moving on

to consider gender and SES.

Prior performance It was expected that better prior performance would accompany more positive competence perceptions, and lower prior performance would accompany lower competence perceptions (see Sections 2.4.1 and 3.2.5). In study 1, the relationship between GPA (English) and perceived competence was marginal (see Table 5.4 and Appendix, Table B.6). Also in study 1, the relationship between GPA (All) and perceived competence was small and non-statistically significant, with a mean correlation of 0.14 indicated (see Appendix, Table 5.4). Sensitivity analysis also indicated that prior performance, as GPA (All), was negatively correlated with materialism across all eight sets, with a mean correlation size of -0.195. The correlation was statistically significant in two out of eight sets (see Appendix, Table B.7).

In study 2, sensitivity analysis indicated that GPA (English) and perceived competence were not statistically significantly correlated at either Time 1 or 2 in any sets (see Appendix, Tables B.16 and B.26). Indeed, GPA (English) was no more than marginally correlated with all of the study's motivational resources in study 2.

In summary, prior performance, as GPA (English), was weakly and often only marginally correlated with motivational resources in both study 1 and 2. Perhaps most unexpectedly, this included perceived competence.

Gender As discussed in Section 3.2.6, it was expected that females would view their language courses more positively than males. Generally, however, this was not the case. For instance, in study 1, gender was not statistically significantly correlated with autonomous motives, controlled motives, or perceived competence. Indeed, correlations in study 1 between gender and these motivational resources did not rise above 0.1. The exception was materialism. In study 1, there was a statistically significant positive correlation between these two variables, $r = 0.25$, $p < 0.01$, with males appearing to be more materialistic than females. Sensitivity analysis showed that in six out of eight sets, this correlational relationship remained statistically significantly positive, with a mean correlation value of 0.234 indicated (see Appendix, Table B.2). Examination of the mean materialism scores for males

and females in study 1 confirmed that females were less materialistic than males: the mean score for females was -0.96 (SD = 0.857), whereas for males it was -0.46 (SD = 0.784). Mean difference effect size analysis indicated the difference in the average score for materialism for females and males in study 1 was associated with a medium effect size, where Hedges' g = -0.60, 95 % CI [-0.24, -0.95]; that is, one that was found to exceed Cohen's (1988) convention for a medium effect (d = 0.50). Also in study 1, gender and SES (Scaled) were statistically significantly correlated), where r = -0.22, $p < 0.01$ (see Table 5.4). Sensitivity analysis showed the relationship remained statistically significant across six out of eight sets, with a mean correlation value of -0.198 indicated (see Appendix, Table B.2). Finally, gender and GPA (English) were negatively, but only marginally, correlated.

Results in study 2 revealed that there were no statistically significant correlations between gender and perceived competence, materialism, or autonomous motives, which was unexpected (see Section 3.2.6). However, gender and controlled motives were statistically significantly negatively correlated in study 2 at Time 1, r = -0.30, $p < 0.01$ across all the sets (see Appendix, Table B.13). The relationship became smaller and non-statistically significant at Time 2 (see Appendix, Table B.23). Contrary to expectations, therefore, there was some evidence to suggest females held *less* adaptive motivational resources in study 2 at Time 1.

Results in study 2 also revealed that gender and GPA (English) were negatively correlated (see Appendix, Table B.13), with sensitivity analysis indicating that the mean correlation value was -0.225. As discussed in Sections 2.4.3 and 3.3.4, large-scale studies have suggested that there is a gender gap in achievement, with females out-performing males and that the size of this gap may be small, where d = 0.21.

Gender and SES (Standardized and Weighted) were statistically significantly negatively correlated, where r = -0.38, $p < 0.01$. Sensitivity analysis indicated that the relationship remained statistically significantly correlated across all eight sets. The mean correlation value was r = -0.379. In addition, sensitivity analysis indicated the relationship between gender and SES (Scaled) was also negative (but not statistically significantly) in all the sets of assumptions, where the mean correlation value was -0.246 (see Appendix, Table B.13). Why gender was negatively correlated

with SES in study 1 and 2 is puzzling. This question is returned to in Section 6.2.

In summary, results across both study 1 and 2 suggested that females held higher HSGPA scores and were from higher SES groups. Males were found to be more materialistic than females in study 1, but there was little evidence of this in study 2. In study 2 (Time 1), females appeared to endorse controlled motives more strongly than males, but there was little evidence of this in study 1, or in study 2 (Time 2). In other words, there was some evidence to suggest that females held more adaptive motivational resources than males, but there was also some to suggest the opposite.

SES As indicated in Section 3.2.7, Butler's (2015) results suggested a small correlation (of perhaps 0.22) between SES and autonomous motives would be found while others suggested no correlation. Sensitivity analysis indicated that in study 1, SES (both SE and SS) and autonomous motives were marginally correlated. Similarly, in study 2 at Time 1, sensitivity analysis indicated they were also marginally correlated. In study 2 at Time 2, SES (Scaled) and autonomous motives were unexpectedly negatively correlated across all eight sets, with the mean correlation value of -0.133 indicated (see Appendix, Table B.28).

From the perspective that wealth affords potential educational advantages in the shape of greater access to better resources and less exposure to chronic stress (Willingham, 2012), it was expected that the correlations between perceived competence and SES would be statistically significantly positive and might approximate to 0.18 (see Section 3.2.8). This expectation, however, was only partially met. Specifically, only in study 1 was SES (Scaled) statistically significantly positively correlated with perceived competence, where $r = 0.22$, $p < 0.01$. Sensitivity analysis indicated that the relationship remained statistically significant in four out of eight sets, with a mean correlation value of 0.188 indicated (see Appendix, Table B.3). In study 2, the correlational relationship between SES (Standardized and Weighted) and perceived competence (Time 1) was small and non-statistically significant (see Appendix, Table B.17), with a mean correlation value of -0.143 indicated. At Time 2, the relationship was marginal (see Appendix, Table B.26). SES (Scaled) was only marginally correlated with perceived competence at Time 1 and Time 2 (see

Appendix, Tables B.18 and B.28). To investigate further potential differences in motivational patterns held by different SES groups in study 1 and 2, a series of median splits using the SES (Scaled) variable were conducted. This variable was chosen over the other SES variable, which was SES (SE) because regression analyses in both studies had demonstrated its importance in predicting academic outcomes.

Performing a median split in study 1 on the SES (Scaled) variable (M = 2.01, SD = 0.254) to create a Low-SES (Scaled) group and a High-SES (Scaled) group revealed no statistically significant differences in motivational resources (i.e., autonomous motives, controlled motives, perceived competence, or materialism). Performing a median split with the SES (Scaled) variable (M = 2.3245, SD = 0.2868) in study 2 at both Time 1 and at Time 2 revealed no statistically significant difference in the non-change motivational resources variables between these Low and High SES groups. As for the motivational change variables, the SES (Scaled) median split revealed that none of the observed differences were statistically significant.

It was also expected that higher SES would be associated with higher prior performance, given students with higher SES would have access to better resources (see Section 3.3.1). However, in neither study 1 nor study 2 was SES (Scaled) statistically significantly correlated with prior performance (remembering that neither IELTS scores nor GPA (All) were included in study 2). The direction was, however, positive in all sets.

In summary, there was limited evidence to suggest that different SES groups held distinctive patterns of motivational resources. Analysis in study 1 indicated that perceived competence and SES (Scaled) were statistically significantly positively correlated, but the size of the correlation was small and the result was not repeated in study 2. No other motivational variable was statistically significantly correlated with SES in either study. There was also little evidence that those in higher SES groups held more adaptive motives. Unexpectedly, in both studies only a weak relationship was found between SES and GPA (English). The GPA (English) score is examined in more detail later and more fully discussed in Section 6.2.

RQ1: The overall pattern of results

Sensitivity analyses indicated that the correlations obtained using various sets of assumptions in a given study were generally similar in direction and size; hence the results obtained from the main data sets in each study can be considered reasonably robust. Furthermore, correlation results between motivational resources across studies 1 and 2 were generally consistent with SDT-related theorizing.

Nevertheless, some less expected results did emerge. First, it was expected that females would hold more adaptive motivational resources than males. In study 1, this expectation was supported, but only for materialism: there was a statistically significant correlation between materialism and gender $r = 0.25$, $p < 0.01$, and mean difference effect size analysis indicated a statistically significant difference in materialism scores for males and females. There was little evidence that females held more adaptive aspirations in study 2. Furthermore, females in study 2 were found to have *less* adaptive motives at Time 1, albeit this was not apparent at Time 2. Second, it was expected that the relationship between competence perceptions and SES would be small but consistent. In study 1, there was a small, statistically significant correlation between perceived competence and SES, where $r = 0.22$, $p < 0.01$, but the relationship was only marginal in study 2 (at both Time 1 and 2). Third, it was expected that autonomous and controlled motives would be positively correlated, but the size of the correlation in study 2 was unexpectedly large. Fourth, correlational results across study 1 and 2 indicated that the relationships between the various personal characteristics variables were weaker than expected. For instance, GPA (English) and SES (Scaled) were weakly (almost marginally) correlated in both studies. Finally, aside from the relationship between autonomous and controlled motives, the pattern of results across study 1 and 2 indicated weaker correlations between the motivational resources in study 2 compared to study 1. Why this might have been so is returned to in Section 6.2.

6.1.4 RQ2: How are grades and personal characteristics related?

The current section examines the relationships between the personal characteristics variables and academic performance. It begins by examining the relationship gender had with academic performance and moves on to consider the prior performance variables and SES.

SES and grades

As discussed in Section 3.3.1, it was expected that SES and grades would be positively associated. Results from large-scale meta-analysis discussed in Section 3.3.1 indicated the correlational relationship between SES and grades was positive and approximated to 0.22. However, sensitivity analysis across all sets in study 1 indicated that SES (Scaled) was negatively correlated with all the study's academic performance indicators (coursework, final exam, and semester grades). In study 1, (see Table 5.4), the correlation between SES (Scaled) and semester grades was statistically significant, where r = -0.25, $p < 0.01$. Indeed, the correlations were statistically significant in six out of eight sets, with a mean correlation value of -0.253 indicated (see Appendix, Table B.3). A similar pattern emerged in study 2. At Time 1 and 2 and across all sets, SES (Scaled) was negatively (but not always statistically significantly) correlated with all the study's criterion variables (see Appendix, Tables B.18 and B.28), with mean correlation values ranging from -0.128 (for final exams) to -0.176 (for mid-term exam) indicated.

In regression analysis in study 1, SES (Scaled) emerged as a statistically significant negative predictor of coursework and semester grades in models 1 and 3. For instance, in study 1, SES (Scaled) was a negative predictor of semester grades in model 1 after controlling for prior performance and motivational resources, where β = -0.304, p = 0.002 (See Appendix, Table B.56). SES (Scaled) was also a negative (albeit non-statistically significant) predictor of final exam scores in study 1 in models 1 and 3.

In study 2, SES (Scaled) was a statistically significant negative predictor of

semester grades. For example, in study 2 at Time 2, SES (Scaled) was a negative predictor of semester grades in model 1, after controlling for prior performance and motivational resources, where β = -0.434, p = 0.009. SES (Scaled) (see Appendix, Table B.70).

In summary, the correlation and regression results in study 1 and 2 concurred, indicating that SES and academic achievement were negatively associated in the current study, often statistically significantly so, with betas not less than -0.3 in all the model 1 analyses except one (Study 1, Final exams). This negative association was contrary to expectations, where higher SES was expected to be accompanied by more social and capital resources, which in turn was expected to facilitate better academic outcomes (Bourdieu, 1986). These findings are returned to in Section 6.2.

Prior performance and grades

As discussed in Sections 3.3.2 and 3.3.3, it was expected that the relationship between prior performance and grades would be positive and small to medium-sized. In study 1, the correlations IELTS exam, GPA (English), and GPA (All subjects) had with semester grades were small but statistically significant, where $r = 0.22$, $p < 0.01$, $r = 0.27$, $p < 0.01$, and $r = 0.29$, $p < 0.01$ respectively (see Table 5.4). Sensitivity analyses indicated that the mean correlation value for GPA (English) and semester grades was 0.21 (see Table B.6). It should be noted, however, that the correlation was only statistically significant in one set. IELTS score and final exam score, and IELTS score and semester grades were, by contrast, statistically significantly correlated in seven out of eight and six out of eight sets respectively.

Regression analyses in study 1 revealed that in regression model 3, IELTS score was a statistically significant predictor of final exam scores, where $\beta = 0.356$, $p < 0.001$ (see Table 5.6). GPA (English) was also retained in model 3 as a statistically significant predictor of semester grades, where $\beta = 0.23$, $p \leq 0.01$ (see Table 5.7).

In study 2, GPA (All subjects) and IELTS were removed from the analysis because of the large number of missing cases (51 for the former and 38 for the latter), which left GPA (English) as the sole prior performance indicator. Sensitivity analysis indicated that the relationship between GPA (English) and mid-term results

was generally marginal (i.e., below a value of 0.1 in most or all sets) (see Appendix, Table B.16). The relationship between GPA (English) and the study's criterion variables was mostly small at Time 2 (see Appendix, Table B.26). For instance, sensitivity analysis indicated the correlational relationship between GPA (English) and semester grades across sets generated a mean correlation value of 0.104.

In study 2, regression analysis indicated that in models 1, 2, and 3a, at Times 1 and 2, and across all the criterion variables, GPA (English) was not a statistically significant predictor, which was contrary to expectations. Examining the variable further, in study 2 the mean score for this variable was 86% (N = 73), which was similar to that in study 1, 90% (N = 166). In other words, the average grade that students received in study 2 was only 4 per cent less than that in study 1; yet the students in study 2 had, after twelve years of English, only achieved an IELTS band that categorised them as low-intermediate learners, failing to achieve an overall Band 5 (unlike the participants, their peers, in study 1) and proving themselves to be in need of additional semesters in remedial English. This seems to suggest that some of the grades awarded by some of the schools responsible for the GPA (English) scores in study 2 were unreflective of the students' actual English abilities. Thus, in contrast to the students in study 2, those students in study 1 who achieved high scores in their GPA (English) may generally have deserved their scores - if their far better performance on the IELTS exam can be taken as a guide.

In summary, the prior performance indicator GPA (English) was more reflective of actual abilities for more students in study 1 than in study 2 if the variable's success at predicting semester grades in the relevant course can be taken as a guide. The differing relationship that GPA (English) had with the criterion variables in study 1 and 2 is discussed further in Section 6.2. Interestingly, when an additional model (Model 3b) was run in study 2 and mid-term results were included, GPA (English) appeared consistently as a statistically significant predictor of coursework, where $\beta = 0.353$, $p < 0.001$. Thus, although there are doubts (as expressed above) about the quality of the GPA (English) variable in study 2, it cannot be dismissed as an entirely inaccurate reflection of EFL ability (or willingness to work) for all the students in the study with regression analysis results indicating that at least some of

the students may have deserved their higher GPA (English) grade. Unfortunately, it cannot be known which students received more accurate (i.e., deserved) GPA (English) grades and which did not. Nor can it be known which bodies (public and private schools) or specific institutions tended to award more or less accurate GPA (English) grades.

Gender and grades

As discussed in Section 3.3.4, it was expected that males would perform worse than females. As a reminder, males were coded as '1' and females as '0'. In study 1 (see Table 5.4), gender was statistically significantly negatively correlated with coursework score (r = -0.39, $p < 0.01$), which was consistent with this expectation. Splitting the file indicated that the mean coursework score for females in study 1 was 81.3 per cent (SD = 9.36), and for males, it was 71 per cent (SD = 13.78). The difference between the male mean coursework score and the female mean coursework score was associated with a large effect size, where Hedges' g = 0.97, 95% CI [0.60, 1.33]; that is, one that was found to approximate to Cohen's (1988) convention for a large effect. Sensitivity analysis indicated gender was statistically significantly negatively correlated with coursework scores across all eight sets, with a mean correlation value of -0.41 indicated (see Appendix, Table B.2). Why females achieved better coursework scores in study 1 is uncertain, but it appears females were more willing to complete coursework tasks. As might be expected (because semester grade was not independent of coursework), gender and semester grade were also negatively correlated. In contrast, the correlation between final exam and gender was marginal (see Appendix Table B.2).

Regression analysis results in study 1 revealed gender to be a statistically significant predictor of coursework grades both in model 1, where β = -0.484, $p < 0.001$ (see Table B.56), and in model 3, where β = -0.506, $p < 0.001$ (see Table 5.5). Gender was also a statistically significant predictor in model 1 of semester grades in study 1, where β = -0.291, $p = 0.004$ (see Appendix, Table B.60).

In contrast to the results in study 1, in study 2 gender was only marginally and non-statistically significantly correlated with all of the criterion variables across all

sets. Similarly, gender was not a statistically significant predictor for any criterion variable in any regression model in study 2.

In summary, these results suggest that the male participants in study 1 were less willing to complete the many small tasks that composed the coursework grade compared to those in study 2. This may have been related to the structure of the courses, an idea that is explored more fully in Section 6.2.

RQ2: The overall pattern of results

Overall, results indicated that the relationship between SES and academic achievement was negative. This was evident across studies, sets of assumptions, and forms of analysis (i.e., both correlational and regression). In contrast, the relationship GPA (English) had with grades varied across studies. In study 1, the relationship was small, albeit occasionally statistically significant in correlation and regression analyses. In study 2, although the relationship became less marginal at Time 2 than Time 1, only in a few cases was there a statistically significant correlation. In no regression models in study 2 at Time 1 or 2 was GPA (English) a statistically significant predictor. Generally, therefore, prior performance indicators were better predictors in study 1 than study 2. Finally, where results from the two studies did differ greatly was in regard to gender. In contrast to study 1, gender was not statistically significantly correlated with any of the criterion variables in study 2; nor did it appear as a statistically significant predictor in any of study 2's regression models (see Appendix, Tables B.13 and B.23). The relationship between gender and the study's criterion variables is discussed more fully in Section 6.2.

6.1.5 RQ3: How are motivational resources and grades related?

This research question asks whether the satisfaction of basic needs is directly associated with a performance advantage when performance is expressed as grades. If so, do motivational resources remain predictive of grades when other predictors such as SES, prior performance and gender are controlled for? In order to answer

these questions, the following section is divided by type of motivational resource (all of which are measured as non-change variables, for the moment). It begins by examining the relationship that autonomous motives had with the study's criterion variables.

Autonomous motives and grades

As discussed in Section 3.4.1, it was expected that the relationship between autonomous motives and grades would be positive and small, with a correlation approximating to 0.25 expected. However, in study 1, autonomous motives did not statistically significantly positively correlate with any of the study's criterion variables (i.e., coursework, final exam, and semester grade). Indeed, the relationships were marginal and negative. Sensitivity analysis indicated the same marginal relationships (see Appendix, Table B.8). Regression analysis in study 1 (Model 1) revealed that after controlling for all other predictor variables, autonomous motives were negatively (albeit not statistically significantly) associated with coursework (β = -0.174, p = 0.111), final exam (β = -0.165, p = 0.171) and semester grades (β = -0.204, p = 0.073). Furthermore, the autonomous motives variable was retained as a negative predictor in all of the study 1 parsimonious regression models (i.e., Model 3) for semester grades, coursework, and final exams (see Tables 5.5, 5.6, and 5.7).

In study 2 at Time 1, sensitivity analysis indicated autonomous motives and mid-term grades were non-statistically significantly negatively correlated across all sets (see Appendix, Table B.21). At Time 2, the sensitivity analysis results were even more unexpected (see Appendix, Table B.31): across a number of sets the autonomous motives variable was statistically significantly negatively correlated with some of the study's criterion variables. For instance, in study 2 at Time 2 (Set 8), the negative correlation between autonomous motives and final exam was small but statistically significant, where r = -0.31, $p < 0.01$. Furthermore, regression analysis indicated that autonomous motives (at Time 1) were negatively associated with mid-term exam scores across regression models 1, 2, and 3a (see Tables B.62, B.63, and 5.16 respectively). Autonomous motives (at Time 2) were also statistically significantly negatively associated with final exam scores in model 3a (β = -0.347, p =

0.004) (see Table 5.18) and semester grades in model 3a (β = -0.303, $p \leq 0.01$) (see Table 5.19).

In summary, the above results, though puzzling, are at least consistent: autonomous motives were, in the overwhelming majority of regression models across study 1 and 2, negatively associated with the current study's criterion variables. These findings are discussed further in Section 6.2.

Controlled motives and grades

As discussed in Section 3.4.1, it was expected that the relationship between controlled motives and grades would be negative and small, with a correlation approximating to -0.12 expected. In study 1, sensitivity analysis indicated controlled motives were positively correlated with coursework, with a mean correlation value of 0.143 indicated (see Appendix, Table B.9). With all the other criterion variables, the correlational relationship was marginal. Regression analysis indicated that in no model, and for no criterion variable was controlled motives a statistically significant predictor.

In study 2 (Time 1), the correlational relationship between controlled motives and the study's criterion variables was in all cases negative and marginal (see Appendix, Table B.20). At Time 2, controlled motives and coursework, final exam, and semester grades were all (non-statistically significantly) negatively correlated, where the mean correlation values indicated were -0.11, -0.205, and -0.193 respectively (see Appendix, Table B.30). Regression analysis indicated that in no model, at no time, and for no criterion variable was controlled motives a statistically significant predictor.

In summary, in both studies, the correlational relationship between controlled motives and the criterion variables was small to marginal. The direction of the correlational relationship varied. In all of the regression models in study 2 (and the majority in study 1), controlled motives were marginal predictors of academic achievement (i.e., the beta values were less than 0.1). Again, the direction of the relationship varied.

Perceived competence and grades

As discussed in Section 3.4.2, it was expected that the relationship between perceived competence and grades would be positive and small, with a correlation approximating to 0.25 expected. Sensitivity analysis in study 1 indicated that perceived competence was only marginally correlated with the study's criterion variables (no table is presented in the Appendix because of this). Although perceived competence appeared a total of 13 (out of a possible 18) times in the regression models in study 1, it was not a statistically significant predictor of any of the criterion variables. In addition, in all cases the size of the regression coefficient was less than 0.1 (see Appendix, Tables B.56, B.58, and B.60).

In contrast, sensitivity analysis in study 2 at Time 1 showed that the size of the correlation between perceived competence and grades was not less than 0.22 (see Appendix, Table B.19), with a mean correlation value of 0.231 indicated. At time 2, perceived competence was not statistically significantly correlated with any of the criterion variables. Sensitivity analysis indicated the mean correlation values for perceived competence (Time 2) and coursework, perceived competence (Time 2) and final, and perceived competence (Time 2) and semester grades were 0.14, 0.135, and 0.168 respectively (see Appendix, Table B.29). Regression analysis at Time 1 indicated perceived competence was a statistically significant positive predictor of mid-term exam scores in model 3, where $\beta = 0.3$, $p \leq 0.01$). At Time 2, perceived competence was not a statistically significant predictor of academic achievement, albeit in the majority of models, the regression coefficient remained above 0.2.

In summary, despite the expectations generated in Section 3.4.2 and the literature on the relationship between perceptions of competence or self-efficacy and academic achievement suggesting that perceived competence would be an important predictor of grades (Jang, Reeve, Ryan, & Kim, 2009; Lee & Stankov, 2013), this was not the case in study 1. These findings are returned to in Section 6.2.

Materialism and grades

As discussed in Section 3.4.3, it was expected that the relationship between perceived competence and grades would be negative and small, with a correlation approximat-

ing to -0.17 expected. In study 1, sensitivity analysis indicated that the size of the correlations were small, with a mean correlation value of -0.15 indicated. The correlations between materialism and the other criterion variables were (non-statistically significantly) marginal. Regression results in study 1 indicated that materialism was not a statistically significant predictor of grades in any model.

In study 2 (Time 1), sensitivity analysis indicated materialism was marginally correlated with mid-term exams (hence no table is shown in the Appendix). At Time 2, sensitivity analysis indicated materialism was again marginally correlated with grades. Regression analysis indicated materialism was not a statistically significant predictor of any of the study's criterion variables in any of the regression models.

In summary, materialism was, across studies, sets of assumptions, and times, mostly a marginal predictor of the current study's criterion variables. In only one instance (in study 1 where the criterion variable was coursework), did the size of the correlation between materialism and this criterion variable approximate to the expected level.

RQ3: The overall pattern of results

In both study 1 and study 2, autonomous motives were unexpectedly negatively associated with grades, often statistically significantly so. Unexpectedly, perceived competence was only a marginal predictor of academic achievement in study 1, where it appeared in just one model 3a (for coursework) with a beta of just 0.094. This can be compared to study 2, where it appeared in all model 3a regressions. In these models, the smallest beta was 0.198 (for coursework) and the largest was 0.273 (for semester grades). Finally, in both study 1 and 2, materialism was mostly a marginal predictor of academic achievement.

6.1.6 RQ4: How are changes in motivational resources related to grades?

Results from study 2 indicated that unlike Black and Deci's (2000) findings (see Section 3.5), autonomous motives decreased from Time 1 (M = 3.25, SD = 0.54) to

Time 2 (M = 3.15, SD = 0.54). In addition, controlled motives also fell from Time 1 (M = 3.05, SD = 0.44) to Time 2 (M = 2.91, SD = 0.47). Materialism also fell from Time 1 (M = -0.44, SD = 0.89) to Time 2 (M = -0.58, SD = 0.98), whereas perceived competence rose slightly from Time 1 (M = 5.98, SD = 0.93) to Time 2 (M = 6.01, SD = 1.07).

Correlational analysis in study 2 using the main data set indicated that CO (T2-T1) and AU (T2-T1) were statistically significantly correlated (r = 0.49, $p <$ 0.001). Similarly, MA (T2-T1) and PC (T2-T1) were also statistically significantly correlated (r = -0.35, $p < 0.01$).

Regression analyses indicated the controlled motives change variable was the only motivational resources change variable to appear in every model 3a, where it predicted coursework scores (β = -0.223, p = 0.055), final exam scores (β = -0.244, p = 0.045), and semester grades (β = -0.289, p = 0.016). These results appear to suggest that a general diminishment in controlled motives from Time 1 to Time 2 was associated with a rise in academic performance; albeit the relationship was not statistically significant at the $p \leq 0.01$ level. Although a fall in controlled motives and a rise in achievement would be consistent with SDT's view that controlled motivation is detrimental to adaptive functioning (Deci & Ryan, 2000), it must also be remembered that autonomous motives fell from Time 1 to Time 2, which is not seen as beneficial in SDT-related terms.

Unfortunately, no qualitative or quantitative data was collected on the reasons why students reported less strong controlled and autonomous motives at Time 2. The fall in the students' autonomous motivation from Time 1 to 2 may not be all that surprising: activities may have ceased to be perceived as interesting or valuable because they were seen as no longer novel, or interestingly difficult, or useful as Van Nuland, Taris, Boekarts, and Martens (2012) suggest. Whatever the reasons for the fall in autonomous motives, it is not viewed as adaptive in SDT.

As for the fall in controlled motives, according to Organismic Integration Theory (OIT; Deci & Ryan, 1985), such a fall may in fact be a sign that some of the students had begun to feel less pressured by external forces and somewhat more volitional with regards to attending a course on which attendance was compulsory

and carefully monitored. Reporting less strong controlled motives may therefore have been an indication that some students had begun internalizing the requirement to attend the course such that the imposed external value, the course's importance, may have become more integrated into the students' value systems, and that this greater internalization may have afforded them performance benefits.

In order to investigate the possibility that better performing students were those whose controlled motives fell the most, a series of median splits were performed using study 2's criterion variables. Examining coursework grades in the main data set first (M = 78.77, SD = 7.29), two groups were formed: the Low-scoring coursework group, whose performance in coursework was below the median score of 79.13, and the High-scoring coursework group, whose performance was above it. Standardized mean-difference effect size analyses indicated that the only motivational resource variable that was statistically significantly different across both sub-groups was the change in controlled motives variable; that is, CO (T2-T1), with the difference between the Low-scoring group's CO (T2-T1) mean score (M = -0.0748, SD = 0.311) and the High-scoring group's CO (T2-T1) mean score (M = -0.2521, SD = 0.3736) associated with a medium effect size, where Hedges' g = 0.52, 95% CI [0.07, 0.96]; that is, one that was found to approximate to Cohen's (1988) convention for a medium effect (d = 0.50). When final exam was the criterion variable, the difference between the change in the High-scoring and Low-scoring groups' controlled motives was not statistically significant for this criterion variable, where Hedges' g = 0.34, 95% CI [-0.09, 0.79]. Finally, semester grades (M = 74.35, SD = 7.54) were examined. Changes in the controlled motives variable were found to be statistically significantly different across groups. Specifically, the difference between the Low-scoring semester grade group's CO(T2-T1) mean score (M = -0.0692, SD = 0.30334) and the High-scoring semester grade group's CO(T2-T1) mean score (M = -0.2576, SD = 0.37711) was associated with a medium effect size where Hedges' g = 0.55, 95% CI [0.10, 1.00]; that is, one that was found to approximate to Cohen's (1988) convention for a medium effect (d = 0.50).

In summary, there was some evidence to suggest that a fall in the controlled motives change variable was associated with better performance. Although the relation-

ship between this predictor and study 2's criterion variables failed to reach statistical significance at the $p \leq 0.01$ level, the variable appeared in every model 3a (unlike the other motivational change variables). In the case of semester grades (see Table 5.22), the relationship between changes in controlled motives and grades approached statistical significance, where β = -0.289, p = 0.016). In addition, mean-difference effect size analyses indicated that greater falls in this variable were associated with better academic achievement.

RQ4: The overall pattern of results

Generally, results indicated that with the possible exception of changes in controlled motives, the motivational change variables were not strong predictors of academic achievement in the current study. The implications of the relationship between the change in the controlled motives variable and grades are discussed further in Section 6.2.

6.1.7 RQ5: Was a generational status gap in achievement discernible?

As discussed in Section 3.6, it was expected that generational status would be a negative predictor of academic achievement. Specifically, it was expected that the relationship between those whose mother or father had not attended a institute of higher education before, termed first-generation students, and the study's criterion variables would approximate to -0.17.

However, correlational results across studies, sets, and times indicated that the first and continuing generation variable was only marginally and non-statistically significantly correlated with the study's motivational resources variables. For instance, in study 1 regression coefficients did not rise above 0.1 for any of the criterion variables in all of the model 1 analyses. Neither was the variable a statistically significant predictor in any of study 1's other regression models (2 or 3). In study 2, the first and continuing variable was only marginally correlated with motivational resources and the study's criterion variables. In no regression model in study 2

was it a statistically significant predictor. In sum, although Harackiewicz *et al.*,'s (2014) research suggested that the performance of first generation students would be weaker than second generation students, there was little evidence of this.

RQ5: The overall pattern of results

There was limited evidence to suggest that generational status was an important predictor of academic achievement. In study 1, the variable was a marginal predictor of academic achievement. In study 2, the relationship between the variable and grades was somewhat stronger but lacked statistical significance.

6.1.8 RQ6: How did students in study 1 and 2 differ?

Using standardized mean-difference effect size analysis, differences between the students' motivational resources in study 1 and 2 (at Time 1 and 2) were investigated. Standardized mean-difference effect size results indicated the difference in the students' materialism scores in study 1 (M = -0.83, SD = 0.87) and in study 2 at Time 1 (M = -0.44, SD = 0.89) was statistically significant, where Hedges' g = 0.44, 95% CI [0.17, 0.71]. In addition, there was a statistically significant difference in the materialism scores for students in study 1 compared to students in study 2 at Time 2 (M = -0.58, SD = 0.98), where Hedges' g = 0.27, 95% CI [0.01, 0.54]. These findings raise the possibility that the students in study 1 achieved better results in the IELTS exam that preceded their entry into the university's English language preparatory course because they were more typically focused on growth and development in their high school careers than the students in study 2, as indicated by the greater importance students in study 1 placed on these goals relative to goals related to the acquisition of wealth and expensive possessions.

Using standardized mean-difference effect sizes analyses, differences between the students' personal characteristics in study 1 and 2 were investigated. Results indicated that the standardized mean-difference effect size between study 1's HSGPA (English) score (M = 89.88, SD = 6.05) and study 2's HSGPA (English) score (M = 85.63, SD = 7.86) was statistically significant, where Hedges' g = 0.62, 95% CI [0.31, 0.93]. It should be noted, however, that the absolute difference was only 4 per

cent.

Unfortunately, using all three prior performance indicators across both studies was not possible because of the low number of students who provided an IELTS score and a GPA (All subjects) score in study 2. Hence examination of prior performance indicator differences between those in study 1 and 2 was restricted to comparisons between GPA (English) scores only. Results also indicated that that the standardized mean-difference effect size difference between study 1's SES (Scaled) score (M = 2.01, SD = 0.25) and study 2's SES (Scaled) score (M = 2.32, SD = 0.29) was statistically significant, where Hedges' g = 1.18, 95% CI [0.89, 1.46]; that is, one that was found to exceed Cohen's (1988) convention for a large effect (d = 0.80). In other words, participants in study 1 were found to be, on average, of lower SES than those in study 2. This is interesting given the academic performance in the IELTS exam of the participants in study 1 was far superior to that of those in study 2 and that throughout study 1 and 2, SES (Scaled) was negatively associated with academic performance.

Differences between the students in study 1 and 2 regarding the study's other predictor variables - perceived competence, autonomous motives, controlled motives, and SES (SW) - were investigated too; however, no statistically significant mean-difference effect sizes were found. In other words, the current study found that the participants in study 1 and 2 statistically significantly differed in three regards: the extent to which materialism was endorsed, SES (Scaled), and GPA (English) results, with the between-groups analysis suggesting that participants in study 2 were statistically significantly wealthier, had statistically significantly lower GPA (English) scores (albeit the actual difference was 4 per cent), and were statistically significantly more materialistic than those in study 1.

RQ6: The overall pattern of results

Statistically significant differences, as evidenced by standardized mean-difference effect size differences indicated the cohort in study 1 achieved a better level of performance in the IELTS exam despite holding, on average, a lower socio-economic status. The cohort in study 1 was also statistically significantly less materialistic

than the cohort in study 2 and had statistically significantly higher GPA (English) scores.

6.2 A discussion of results

The study's main findings are now discussed with the intention of explaining, with the help of the relevant literature, more fully what has been found. Implications for practice are addressed in Chapter 7. The discussion begins with the theory-consistent correlational relationships found between the study's motivational resources variables.

6.2.1 A consistent network of inter-relations

In the current study, the directions of the correlational relationships between motivational resources were consistent with SDT-related theory. For instance, perceived competence was positively correlated with autonomous motives, autonomous motives and materialism were negatively correlated, and materialism and perceived competence were negatively correlated. These relationships were mostly small (but stronger than marginal and often statistically significant). In contrast, controlled motives were mostly marginally (and non-statistically significantly) correlated with the other motivational resources variables, with the exception of autonomous motives, a relationship which is discussed next. This consistency between expected and actual inter-relations across study 1 and 2, along with scale analysis from both studies (see Tables 5.2, 5.8, and 5.9), and test-retest results from study 2 (see Table 5.14) help diminish concerns that one of the current study's seemingly anomalous findings, that autonomous motives and grades were negatively associated, arose solely as a result of the use of instruments that were lacking in concurrent validity and/or reliability.

6.2.2 An environment like high school

Results also indicated that autonomous and controlled motives were statistically significantly positively correlated across both studies, across all sets, and across

Times 1 and 2. In study 1, the mean correlation was 0.39. However, in study 2 at Time 1, the mean correlation value was 0.51 and at Time 2, it was 0.6, which was unexpectedly large. What accounts for these strong correlations?

In Areepattamannil, Freeman, and Klinger (2011), the correlation between intrinsic and extrinsic motives for a group of Indian adolescents (with mean age 16.88) living in India was compared to a group of Indian immigrants living in Canada (mean age 16.04). For the former group, the size of the correlation was large, where $r = 0.57$; for the latter group, it was medium, where $r = 0.34$. Areepattamannil, Freeman, and Klinger (2011) suggested that differences in the autonomy-support that teachers offered the students and the classroom goals that were emphasized in the two contexts may help account for this difference. A similarly strong correlation was found in Al-Dhamit and Kreishan (2016), whose participants were 122 Jordanian high school students. The reported correlation between intrinsic and extrinsic motivation was 0.61. In both these studies, however, participants were adolescents.

In contrast to these medium-sized correlations, in Vansteenkiste, Zhou, Lens, and Soenens's (2005) study 2, whose participants were Chinese students with an average age of 22.6 (and who were presumably university students), the correlation between autonomous and controlled motives was small, where $r = 0.32$, $p < 0.01$. Together, these three studies suggest that rather than ethnicity (i.e., non-Western) as a reason for why autonomous and controlled motives were strongly correlated in the current study, it is the educational context that matters, with Ratelle, Guay, Vallerand, Larose, and Senécal (2007) suggesting that high school adolescents generally face greater constraints and less choice than university students. In other words, it can be expected that for adolescents at high school, the correlation between autonomous and controlled motives will be stronger. Other results from studies whose participants were Western (Alivernini & Lucidi, 2011; Garon-Carrier *et al.*, 2016) also indicate that high school students' autonomous and controlled motives were more highly correlated compared to those of university students (Black & Deci, 2000).

Following on from this, it is hypothesized that although the current study's participants attended university, the strong correlation between autonomous and controlled motives reported in Section 6.1 suggests that the current study's partic-

ipants perceived their educational experiences to be closer to those of high school than university, with the mandatory nature of the course, the strict monitoring of attendance, and the punishment of excessive absences by exclusion from the course perhaps contributing to this perception.

The idea that students found the course controlling in some way(s) seems to be further supported by the finding that autonomous and controlled motives were more strongly correlated in study 2 than 1, where $r = 0.52$, $p < 0.01$ and $r = 0.65$, $p < 0.01$ in study 2 at Time 1 and 2 respectively and $r = 0.36$, $p < 0.01$ in study 1. Although all the students in the current study had no choice but to pass the university's preparatory EFL course if they wished to enter their chosen major, the students in study 1 were on average only required to take three hours of English a week for one semester, whereas the students in study 2 were required to take twenty-five hours of English a week for up to an additional one or two (or even three) semesters. The difference in circumstances may have led the students in study 2 to feel more ambivalent towards their course such that a self-determined desire to pursue a chosen major could have existed alongside stronger feelings of coercion.

In summary, the strong correlation between autonomous and controlled motives found in the current study is, it is offered, indicative of an educational experience that was perceived to be more constrained, less choiceful, and more like high school for the current study's participants. The implications of this are discussed in Chapter 7.

6.2.3 IELTS as a predictor of grades

Although the relevant literature presents mixed evidence for the usefulness of IELTS scores as a predictor of academic achievement (see Section 3.3.3), the current study's results suggest that IELTS scores was a useful and important predictor. However, because of missing data the variable was only retained in study 1, whose participants were generally more capable EFL learners compared to those in study 2. Therefore, the usefulness of IELTS scores as a predictor of grades is unsupported in study 2. This may be important: if IELTS scores are less discriminating at lower ability levels

than higher ones, scores for the less able students (such as those in study 2) would be expected to predict less variance in grades.

6.2.4 Gender, coursework, and SES

Across both studies, there was evidence of a gender gap in academic performance (see Section 6.1.4). However, this general pattern hides some potentially important variation. In study 1, students were faced with a somewhat different course structure to those in study 2. Specifically, although individual, specified grades were know to the teachers in study 1 (as they were in study 2), in study 1 alone, students were publicly awarded a 'pass' or a 'fail', with the pass mark set at 60 per cent. Across both studies, it was shown that a gender gap in performance was present to some extent for at least one of the criterion variables in each study, but in study 1 one of the largest beta values in any model 3 (or 3a) emerged when gender was a predictor of coursework scores, with the difference between average male and female coursework scores showing an effect size of 0.97 (see Section 6.1.4 for details). In contrast, gender did not appear in the regression model 3 for final exam in that study. In addition, gender was not even retained as a predictor in study 2 when coursework was the criterion variable. How can the relationship between gender and coursework in study 1 be explained?

One possible explanation is that females in study 1 were more willing than males to complete all the small tasks that composed the coursework grade, and that conversely males were more likely to act strategically (i.e., acting to obtain maximal output for minimal input), reasoning that many or most of the small tasks that composed the coursework grade were inessential, and investing most of their effort on the final exams instead, where no gender effect was found because males and females were equally concerned by this high-stakes test. In other words, it appears that females in study 1 generally did what they were asked to do by their teachers, spreading their efforts more uniformly across the various tasks, assignments, and exams that composed the course's assessment tools. On the other hand, males appear to have taken a more risky strategy, relying more heavily on a good result in the final exam instead (which composed 40 per cent of available marks) to get the

pass they required. If so, this begs the question why females acted less strategically, were less willing to rely heavily on a high-stakes test than males. Duckworth and Seligman (2005, 2006) have suggested that females tend to be more self-disciplined than males. This suggests that females not just in study 1 but also in study 2 would be more likely to complete all the coursework tasks; however, as Tables 5.15 and 5.17 indicate, there is little evidence from correlation or regression analysis to indicate that males acted strategically in study 2. Therefore, an explanation for why females rather than males were more likely to complete coursework tasks in one course but not in another is still required. One possibility is that the 'culture' surrounding each course played a part, with the value that students and teachers believed each course had, the purposes each course was believed to serve, and the influence that assessment environments had (with differential emphases on pass/fail as a criterion for success) all factors in explaining why this particular gender effect emerged so strongly in this particular study. This issue is returned to in Chapter 7.

Another unexpected result was the relationship between SES and gender (see Section 6.1), with analysis indicating these variables were often statistically significantly negatively correlated. One possible reason is that the institution at which the study was conducted was selected as a first-choice by more of the parents whose SES was higher because it offered, perhaps uniquely for a UAE-based higher education institute, gender-separated dormitories and (mostly) gender-separated classes, whereas the institution could have been chosen by the male students for different reasons, ones in which living and classroom arrangements were less important than the offer of a scholarship or just the offer of a place when other, more preferred (and possibly more expensive) institutions were unavailable.

Finally, results in 6.1.3 indicated that males held stronger materialistic aspirations than females in study 1 (only). As discussed in Section 3.2.6, Dittmar, Bond, Hurst, and Kasser (2014) found that gender was a statistically significant moderator of the relationship between materialism and well-being. They suggested that males, because of their traditional role as 'breadwinners', may be more likely to be focused on wealth than females. One possibility, therefore, is that the stronger (more traditional) gender roles in the society from which the participants came and

the less time the students in study 1 relative to those in study 1 had to wait until entering the workplace (which may have contributed to making the 'breadwinner' role more salient) may account for why materialism and not any other psychological variable showed gender-related differences and why correlational results differed across studies.

6.2.5 SES, labour market conditions, and grades

SES (Scaled) was perhaps the most consistent and significant predictor of academic performance in the current study. Unexpectedly, it was, however, statistically significantly negatively associated with academic performance indicators across studies, sets, forms of analysis, time periods (in study 2), and with change and non-change variables entered into regression models.

All of the results concerning the relationship between SES (Scaled) and the study's criterion variables consistently point towards this variable being negatively associated with academic performance. In addition, the current study found a large and statistically significant difference in the mean SES (Scaled) scores for participants in study 1 and 2, with the participants in study 1 achieving better results on the IELTS exam than those in study 2 despite a lower SES mean score overall (see Section 6.1.8).

Such findings are, however, at odds with much of the literature, which suggests, for instance, that wealthier families are better able (Willingham, 2012) and increasingly determined (Reardon, 2013) to use their resources to ensure their children have the best possible chance of obtaining educational success. Given this implies that SES and grades should be positively and not negatively associated, the question of how to account for the current study's findings arises. One possibility is that SES was confounded with another, unmeasured variable; namely, ethnicity (or nationality).

According to Saegert *et al.* (2007), ethnicity and race are often conflated with SES. Given the university in the current study offers opportunities for Muslim students from poorer countries to come and study there, one possibility is that this lower SES group was more motivated to achieve better academic results than those

in higher SES groups because these lower SES students believed that competition for jobs was intense, that education was a means of gaining advantage, and that the same well-paid (but relatively low-skilled and relatively easily-obtained) opportunities available to their Emirati peers (Ridge & Farah, 2012) would be unavailable to them (See Section 1.9). In other words, the prospect of more difficult labour market conditions for some of the non-Emirati and/or lower SES participants may have been a distal, but important, factor in encouraging greater engagement and better performance from some of the (less affluent) students. However, without collecting data on the nationality of participants, the relationship between nationality, labour market conditions, SES, and performance remains speculative.

Another unmeasured variable that may be connected to nationality is scholarship award. At the university in question, female Emirati students from the Emirate of Sharjah do not have to pay fees for the first year of their university studies. However, students from other Emirates and other countries have to pay unless they are able to obtain a private scholarship or unless their family circumstances warrant the award of a scholarship. If some of the individuals who obtained scholarships came from lower SES groups (which may or may not have entirely overlapped with nationality) and if the continuance of a scholarship award given in these circumstances were contingent upon the attainment of a level of performance specified by the sponsor (which appears to be the case), then this also provides a (speculative) reason for why SES and grades were negatively associated.

6.2.6 Reconfigured competence, inflated GPAs, and grades

According to SDT-related theory (Jang, Reeve, Ryan, & Kim, 2009), Achievement Goal Theory (Elliot & Dweck, 2005), and the literature surrounding academic achievement (Jiang, Song, Lee, & Bong, 2014; Stankov & Lee, 2014), competence is an important predictor of academic performance. In study 1, however, perceived competence appeared in just one model 3 regression model (as a non-statistically significant predictor with a regression co-efficient less than 0.1). In contrast, regression analysis in study 2 indicated perceived competence was a statistically significant predictor of mid-term results in model 3 (see Section 6.1.5). It was also present in

every model 3 in study 2, where its regression co-efficients did not fall below 0.23.

It *appears* that the students in study 2 were more accurate in their competence perceptions than those in study 1, given perceived competence was a stronger predictor of the relevant criterion variables. However, it will be argued that the competence perceptions of those in study 1 may have been more accurate than they first seem and that the prior performance indicators in study 2 were less accurate than they appear.

First, GPA (English) was statistically significantly positively correlated with semester grades in study 1 (see Table 5.4) but not in study 2 (see Tables 5.11 and 5.12). Similarly, in regression this prior performance variable was a statistically significant predictor of semester grades in study 1 (see Table 5.6), but not study 2 (see Table 5.19). Given this prior performance indicator was an important predictor of grades in study 1, it is puzzling that perceived competence, which draws upon prior performance as a source of feedback that contributes towards perceptions of competence, was not also a significant predictor in study 1.

One possible explanation for why perceived competence proved to be a marginal predictor of academic achievement in study 1 (but not in study 2) is the type of course that the students were embarked on. Specifically, because the course in study 1 was emphasized as being a pass/fail one and because (anecdotally) it was seen by many students as not optimally-challenging, the possibility is that participants in study 1 reconceptualized their competence perceptions, equating 'doing well in the course', which is the phrase used in the perceived competence measure, with 'passing the course'. In other words, instead of the students in study 1 possessing inaccurate beliefs about their abilities (which seems unlikely given the prior performance indictors were important predictors in regression in study 1), the weak association between perceived competence and academic achievement was, instead, the outcome of this reconceptualization.

A different pattern of results in study 2 requires a different interpretation of the relationship between GPA (English), competence perceptions, and grades. In study 2, perceived competence was a stronger predictor of academic achievement, statistically significantly predicting mid-term exams ($\beta = 0.3$, $p \leq 0.02$) (see Table 5.16),

and appearing in every model 3a for the study's other criterion variables. At the same time, however, GPA (English) was not a statistically significant predictor in any model 1, 2 or 3a for any of the criterion variables in study 2. In other words, in study 2, perceived competence predicted course grades, but the prior performance indicator GPA (English), which is assumed to inform competence perceptions, did not. Furthermore, GPA (English) was *negatively* (albeit marginally) correlated with perceived competence. How can these relationships be explained? One possible explanation is that GPA (English) scores for the students in study 2 were generally less accurate than those in study 1. This, however, raises a further problem. If prior performance is an important source of information for competence perceptions (Bandura, 1993, Pajares, 1996), and if the GPA (English) prior performance indicator was inaccurate, what helped some students form their reasonably accurate competence perceptions?

First, if some of the GPA (English) scores in study 2 were misaligned with actual, IELTS-passing abilities in EFL, this would help account for the lack of a statistically significant relationship between GPA (English) and grades in study 2. The finding that only 4 per cent separated the mean GPA (English) score of participants in study 1 from that of participants in study 2 (see Section 6.1.8) appears to suggest that for some of the students in study 2, their GPA (English) scores were inflated, given the level of achievement of those in study 1 in the IELTS exam far exceeded the achievement of those in study 2. However, this is not to suggest that *every* GPA (English) score in study 2 was inaccurate. Second, it is possible that some of the students retained a naive view of their GPA (English) scores, while others did not. Results in their IELTS exams (if they took one, and not all the students in study 2 did) would have told some of the students that a GPA (English) score in excess of 80 or 90% meant little when a minimum requirement of an overall Band 5 in the internationally-validated IELTS exam could not be reached. Such a (disappointing) result could have encouraged some of these students to re-examine their competence levels (as opposed to, for instance, blaming bad luck and factors outside their control) and more accurately assess their EFL ability.

The current study does not allow for the identification of individual schools (or

types of schools) that contributed towards the posited inflation of GPA (English) scores. Furthermore, it must be remembered that results from model 3b analyses in study 2 indicated that after controlling for mid-term results, GPA (English) was a statistically significant predictor of coursework and final exams, so it cannot be said that all GPA (English) in study 2 scores were inflated.

Finally, the above results concerning perceived competence are all the more puzzling if differing degrees of task specificity are considered. According to Lee and Stankov (2013, p. 127) when students are asked to indicate their competency to perform a task, greater specificity of the task tends to mean competence is more accurately assessed. As participants in study 2 were asked to assess their competence across four separately assessed skills (Writing, Reading, Listening/Speaking, and Grammar/Vocabulary), it could be argued that, compared to students in study 1 who assessed their competence in relation to just one skill (Reading), the students in study 2 had *less* task specificity to work on than the single skill students in study 1; yet competence perceptions were important predictors in study 2 only.

In summary, it is posited that in study 1 the emphasis on pass/fail in that study's course contributed towards a reconceptualization of competence perceptions, one in which 'ability to do well in the course' was redefined as 'the ability to pass the course'. In study 2, prior performance was posited to have been a problematic variable due to the presence of grade inflation in GPA (English) scores, though it is possible that not every student naively accepted the high level of EFL proficiency implied by a high GPA (English) score. In Chapter 7, the implications of these findings are discussed further.

6.2.7 The problem with autonomous motives

One of the current study's most puzzling findings was the discovery that autonomous motives were often negatively associated with academic performance. In both study 1 and study 2, across correlational and regression analysis as well as in the majority of sets, evidence of this negative (and often statistically significant) relationship was consistently found. At times (for instance, in study 2 at Time 2), the negative correlation coefficient approached medium-size and regression analysis showed the

variable to be a statistically significant negative predictor of academic performance in a number of the regression models, even when prior performance and SES were controlled. How is it that those who indicated most strongly that they enjoyed their studies and felt autonomous in class did not necessarily perform well in their quizzes and exams?

The general model of achievement

As a step towards explaining why autonomous motives were negatively associated with grades, an examination of the predictor variables in the current study that were not included may be required. In Chapter 2, it was suggested that for achievement goals, aims can be separated from reasons, or motives. The current empirical study examined only motives, not aims. However, these aims may help to explain the unexpected negative relationship found between autonomous motives and grades.

Achievement goals, competence, and culture

In attempting to explain this unexpected relationship, Lee, Sheldon, and Turban (2003) is important for two reasons. First, it showed that an autonomous orientation (assessed as an individual difference personality variable) predicted mastery goals, which supports the belief that SDT and AGT can and should be linked (see Chapter 2). Second, their study showed that mastery goals predicted mental absorption and enjoyment but not academic performance (assessed as class grades) or goal level (i.e., goal difficulty).

Interestingly, in their introduction Lee, Sheldon, and Turban (2003) stated they did not expect there to be a relationship between the mastery goal construct and grades because "the normative goals measured in this context (i.e., grades in the course) do not reflect personal standards of success" (p. 259). In other words, Lee, Sheldon, and Turban (2003) suggested that those who commit to mastery goals and self-referential standards, and whose behavioural regulation is more self-determined, do not necessarily commit to achieving high grades.

But why should self-referential standards, self-determined regulation, and grades be unrelated? After all, many achievement goal theorists agree that mastery goals

are adaptive and promote positive outcomes such as interest, mental focus, and deep learning (Midgely, Kaplan, & Middleton, 2001), and SDT is no different with regard to the positive outcomes that self-determined motivation has been associated with (Deci & Ryan, 2000). If students in the current study who endorsed autonomous motives also adopted mastery goals (and not performance-approach or performance-avoidance goals) as Lee, Sheldon, and Turban's (2003) results suggest, then according to goal theorists who believe that holding multiple goals (i.e., both performance and mastery) is best for academic performance (Barron & Harackiewicz, 2001; Harackiewicz, Barron, Pintrich, Elliot, & Thrass, 2002), the lack of concern for normative performance standards that pursuit of mastery goals *alone* entails is a potential reason why goals and grades are often not related. If in the current study mastery goals (but not performance ones too) were pursued by those who endorsed autonomous motives, the study by Lee, Sheldon, and Turban (2003) and the multiple goals perspective offer an explanation, which draws on the self-referential standards that characterize mastery goals, for why motives, goals, and grades were disconnected.

However, motives and grades in the current study were in fact *negatively* associated, and few studies that have made use of achievement goals to investigate academic performance have found that mastery goals were negatively associated with grades. One exception is a study by Bouffard, Boileau, and Vezeau (2001) whose participants were 336 French-Canadian secondary students. It may be significant that both competence beliefs (as self-efficacy) and prior performance were controlled in this study's regression analyses, as they were in the current study. Bouffard, Boileau, and Vezeau (2001), who also found their results 'difficult to explain', speculated that less competent students, who believed they could not attain high grades but who wanted to learn nonetheless, may have selected mastery goals in preference to performance-related goals because the latter were synonymous with good grades, a desirable outcome which was, nevertheless, felt to be unattainable. Hence, although mastery goals may have been chosen by some for the love of learning they imply, it is also possible they were chosen to avoid an admission of relative *in*competence. While such an explanation seems somewhat unlikely in the current

study, where the mean perceived competence score was 6.1 and 6 in study 1 and 2 respectively (from a possible 7), the analyses performed and the measures used cannot discount the possibility that competence perceptions moderated the relationship between aims, reasons, and grades.

An alternative explanation for why autonomous motives were negatively associated with grades relates to culture and arises from the fact that Lee, Sheldon, and Turban (2003) did not differentiate between mastery approach and mastery avoidance goals. Other studies have found that mastery avoidance goals, and more specifically, those with intra-personal standard of competence, also predicted interest (Madjar, Kaplan, & Weinstock, 2011), which is not inconsistent with Lee, Sheldon, and Turban's (2003) results. If it is the case that those from collectivist cultures are, as Elliot, Chirkov, Kim, and Sheldon (2001) suggest, more likely to adopt avoidance goals, this raises the possibily that the mastery goals that the students in the current study pursued were predominately avoidance ones. If so, this may help to account for the negative relationship between autonomous motives and grades, given mastery avoidance goals tend to be negatively associated with academic performance (Elliot & Thrash 2001). Assuming that the current study's participants are from a collectivist culture, there is, however, no evidence in Elliot, Chirkov, Kim, and Sheldon's (2001) study, or the present one, to suggest that autonomous motives were associated with mastery avoidance goals. Thus, while an appeal to culture, collectivism, and mastery avoidance goals to explain the current study's results cannot be ruled out, it cannot be considered particularly convincing either.

Social utility and social desirability

A different approach, one which locates achievement goals within a social value context and investigates the role that social judgements play in moderating the relationship between mastery goals and academic achievement, seems to offer more hope of arriving at an adequate explanation. This social value approach provides insights into the reasons why students publicly endorse particular achievement goals. According to social value theorists, the field of higher education has an institu-

tional discourse that explicitly promotes learning and self-improvement (Dompnier, Darnon, & Butera, 2009; Darnon, Dompnier, Delmas, Pulfrey, & Butera, 2009). Not only do students in higher education understand and attend to prevailing social values (Dompnier, Darnon, & Butera, 2009), they also make judgements based on them. When the reasons for endorsing mastery goals is investigated, it transpires that some students value them because they believe such goals will help them achieve fulfilling university careers. The social judgement privileged in such an endorsement is termed social utility (Dompnier Darnon, & Butera, 2013, p. 589). However, some students also endorse mastery goals because they believe that this will be appreciated by their teachers. The social judgement privileged in such an endorsement is termed social desirability and indicates a desire to be accepted and liked by the social group to which the individual belongs (Dompnier Darnon, & Butera, 2013, p. 589).

A number of studies which have taken a social value approach and examined the relationship between goals and academic achievement have shown students' social value judgements moderate the relationship between mastery goals and academic performance. For instance, Dompnier, Darnon, and Butera (2009), found a negative association between mastery goals and grades when social desirability concerns were included in their analysis, prompting them to describe the adoption of these goals as 'faking it'.

It is highly speculative, but perhaps the reasons (i.e., autonomous and controlled motives) focused on in the current study were not the only or most important ones for the study's participants; perhaps some of the students who strongly endorsed autonomous motives did so for reasons of social desirability. The route to this possible explanation is not direct because there is little to connect autonomous motives with social desirability concerns in the relevant literature at present time. Instead, the indirect route moves from the association that autonomous motives have with mastery goals (Betina, Roth, & Deci, 2014; Michou, Vansteenkiste, Mouratidis, & Lens, 2014), to the finding that the strong endorsement of social desirability has been shown to negatively moderate the relationship between mastery goals and academic achievement (Dompnier, Darnon, & Butera, 2009). In this way, it can be

speculated that autonomous motives were endorsed for social desirability reasons, with a number of students endorsing autonomous motives because they wished to appear 'nice', and not because they wanted to learn and improve. Why might appearing 'nice' be a concern for the students?

One reason might be that the current study raised the suspicion in some of the students that the performance of their teachers was being scrutinized in some unknown, unexplained way. Consequently, some of the weaker (but loyal) students may have felt compelled to express their interest and enjoyment in the course; that is, they may have been more likely to endorse a social desirability value, rather than a social utility one. That the weaker ones might have been more likely to do this may have been the result of a (forlorn) hope that by approving of their teacher in this manner they would be able to reap, in a *quid pro quo* fashion, grade-related rewards.

Finally, returning to AGT and the separation of aims from reasons (see Chapter 2), Benita, Roth, and Deci (2014) speculated that Dompnier, Darnon, and Butera's (2009) social desirability and social utility reasons were comparable to autonomous and controlled reasons for pursuing aims: where social desirability was a less self-determined reason and social utility was a more self-determined one. This raises a question over the extent to which Dompnier, Darnon, and Butera's (2009) social desirability and utility reasons can and should be theoretically and empirically separated from SDT's autonomous and controlled reasons when investigating the relationship between aims, reasons, and valued educational outcomes. As a consequence of Benita, Roth, and Deci (2014) theorizing, some considerable doubt is cast on the possibility that autonomous motives could be associated with social desirability concerns. However, from an empirical standpoint, the issue remains unresolved at the present time.

The problem with interest

Another possible reason for why autonomous motives and grades were negatively associated is suggested when interest and enjoyment are problematized. Seeking to understand the puzzling finding that mastery goals were often unrelated to academic

performance, Senko and Miles's (2008) interest-based studying construct measured the extent to which students studied what they found personally interesting and neglected to study the parts of the course they found uninteresting. Senko and Miles (2008) showed that students who took an 'interest-based studying' approach earned lower course grades (β = -0.15), with path analysis indicating that the association between mastery goal orientation and 'interest-based studying' was strongly positive (β = 0.50). It is speculative but perhaps not unwarranted to suggest that the negative relationship between autonomous motives and grades in the current study may have been the product of an approach in which some students reported higher levels of interest, pursued mastery goals strongly, and adopted a selective program of study, and that this program of study was not wholly congruent with their teachers' teaching agenda. This possibility rests on the assumption that autonomous motives can be linked to mastery goals, for which there is some evidence (Cerasoli & Ford, 2014; Ciani, Sheldon, Hilpert, & Easter, 2011; Gaudreau, 2012) and that autonomous motives can be linked to 'interest-based studying' approaches, for which little evidence exists at present.

However, if the theorized disconnect between teachers' and students' agendas is accepted, students' grades in the current study may have suffered to the extent that the students' interests led them away from revising some elements of the course and towards pursuing other, more personally interesting elements. Following this line of argument suggests that some of the students who strongly endorsed autonomous motives were more likely to have held strong views about what they liked (and disliked) and that their interest-based studying approach led them to focus on what was of interest to them, to the exclusion of less interesting (but important) elements. Again, it is speculative, but such an interest-based studying approach may have been exacerbated by the nature of the course: its syllabus was aligned with the perceived demands of the IELTS exam, meaning that in striving to meet these perceived demands, it was resistant to adaptation by teachers for the purposes of exploiting and encouraging student interest. This is discussed further in Chapter 7.

The test-driven nature of the course may have been partly responsible for exacerbating the theorized disconnect between teaching agendas and learning agendas,

but there may also be a cultural dimension. Specifically, the Gulf Arab countries (Saudi Arabia, the UAE, Qatar, Kuwait, Oman, Bahrain) are often portrayed as having an oral-based culture (Heard-Bey, 2004), one in which leisure-time reading is a relatively neglected habit (Kamhieh, 2012; Rajab & Al-Sadi, 2015). Following on from this, one possibility is that the parts of the course that the students found uninteresting and outside their interest-based studying agenda encompassed an entire skill: Reading. It is possible that some of the students who endorsed autonomous motives had the oral/aural skills of Speaking and Listening at the forefront of their minds, and were neglectful of, or dismissive about, the fact that they were also required to study what they considered to be an uninteresting skill. The finding (in Section 4.11) that mid-term Reading scores were, unlike the other skills, not significantly correlated with final exam Reading scores, may be evidence that students retreated from engagement in this particular skill more than in others, and that this retreat was related to their interest-based studying approach.

Autonomous motivation, the testing environment, and study strategies

Thus far, the assumption has been that the negative relationship found in the current study between autonomous motives and grades was anomalous in relation to the theoretical predictions of SDT (Deci & Ryan, 2000) and one of the theory's most frequently-referenced studies (Black & Deci, 2000). However, another possibility is that the current findings are in fact consistent with two (of the few) SDT-related studies that have used a longitudinal design to examine the relationship between self-determined motivation and academic achievement.

Specifically, results from both Alivernini and Lucidi (2011) and Garon-Carrier *et al.*, (2016) raise questions about whether greater intrinsic motivation is unfailingly associated with better grades, with Garon-Carrier *et al.*, (2016) in fact arguing that intrinsic motivation is driven by achievement (i.e., 'I like it because I get good grades in it'). However, Garon-Carrier *et al.*, (2016) did speculate that intrinsic motivation might have predicted performance if exams had consisted of more complex tasks that tested deeper, conceptual learning. This posited relationship between intrinsic motivation, the quality of information processing it encourages, and a testing en-

vironment that rewards deeper learning is consistent with results in Vansteenkiste, Simons, Lens, Soenens, and Matos (2005), where autonomous motives were associated with the deep processing of information and grades, but only when graded tasks that required deep processing were separated from those that did not.

In the current study, it is hard to see why, given the relationship between autonomous motives and grades was most often negative, autonomous motives (and the posited deeper learning that accompanies these motives) should be *penalized* by the testing environment. One possibility, already discussed above, is that the teachers' and students' agendas diverged (Senko & Miles, 2008), with students only studying the parts of the syllabus or curriculum that interested them. A related possibility is that the students' interest-based studying agenda also meant that the learning strategies students employed were restricted. It has been suggested that learners of EFL can benefit from the rote-memorization of new vocabulary items, as part of a broadly-based collection of learning strategies (Shen, 2003). If the students' interest-based learning agendas encouraged them to pursue a narrow range of strategies (for instance, it led them to ignore or under-use 'surface ones'), then this may have impacted on their grades. Although the General Model of Achievement (see Chapter 2) encourages researchers to examine the cognitive and meta-cognitive strategies that learners use, the possibility that some of the students who endorsed autonomous motives undermined their grades by narrowing their range of learning strategies remains unresolved in the current study.

Bias

If, as the current study suggests, autonomous motives were negatively associated with academic performance, the question of why more SDT-related studies have not reported similar results arises. One possibility is that researchers have found, as I have, the building of a nomological network around such unexpected results difficult. As a consequence, they may have decided not to publish their results (i.e., Bottom-drawer bias), or found that journals were disinclined to accept their work because it challenged more established views (i.e., Publication bias).

6.2.8 Internalization and integration, and grades

Students reported less strong controlled and autonomous motives in study 2 from Time 1 to Time 2. The fall in the students' autonomous motivation from Time 1 to 2 may not be all that surprising: activities may have ceased to be perceived as interesting or valuable because they were seen as no longer novel, or interestingly difficult, or useful: as Van Nuland, Taris, Boekarts, and Martens (2012) suggest. Whatever the reasons for the fall in autonomous motives, it is not viewed as adaptive in SDT.

In contrast, according to Organismic Integration Theory (OIT; Deci & Ryan, 1985), humans are viewed as innately orientated towards internalizing and integrating extrinsic values when the social context is need-supportive. Hence, a fall in controlled motives may be a sign that some of the students had begun to feel less pressured by external forces and somewhat more volitional with regards to attending a course on which attendance was compulsory and carefully monitored. The current study's findings suggest that falls in controlled motives were associated with performance-related benefits.

Support in the relevant literature for a fall in participants' controlled motives being associated with better grades arguably comes from Black and Deci (2000). This study used the RAI, which is a composite measure combining controlled and autonomous motives into a single index of self-determined motivation. With such a measure, a rise in self-determined motivation can come from a fall in controlled motives or a rise in autonomous motives. The use of the RAI in Black and Deci (2000) makes it difficult to know the precise nature of the change in their participants' overall motives (see Section 3.4.1), opening the possibility that it was a fall in controlled motives that contributed (perhaps in concert with a rise in autonomous motives) to the students feeling more self-determined, a change that was positively associated with semester grades and which was theorized to be a consequence of teacher autonomy support.

However, as the current study did not collect data on the autonomy support students believed their teachers provided them, it cannot be known if this was an important factor in students feeling less controlled at Time 2. Nonetheless, support

for the belief that diminishing levels of controlled motives may be adaptive when academic performance is the criterion variable also comes from other SDT research that has taken a person-centred (as opposed to variable-centred). For example, in Boiché and Stephan (2013), five clusters of students were identified. Those in the 'most self-determined motivation' cluster were the highest performing students. This cluster had the second lowest levels of controlled regulations of all five groups (if amotivation is included, it had the lowest) while its levels of autonomous forms of regulations were the second highest. Similarly, in Vansteenkiste, Sierens, Soenens, Luyckx, and Lens (2009), their cluster analysis in study 1 identified four groups. The group with the lowest level of controlled motives (and the second highest autonomous motives) was again the group with the highest grades. A similar pattern of results was also reported in Vansteenkiste, Sierens, Soenens, Luyckx, and Lens's (2009) study 2. Although academic performance was not the criterion variable, of the four clusters that emerged, the one with the most cognitive processing, meta-cognitive regulation, and effort regulation was also the group with the lowest controlled motivation score (p. 681).

6.2.9 Time for growth

In Ku, Dittmar, and Banerjee (2012) it was suggested that a more materialistic orientation was associated with poorer academic performance. This poorer performance by individuals who pursue extrinsic (i.e., materialistic) goals can be understood as a function of students' engagement in learning tasks, where more materialistic individuals tend to be "less deeply involved in the learning tasks because engagement in such tasks is only valued to the extent that they are instrumental for reaching extrinsic goals" Vansteenkiste, Timmermans, Lens, Soenens, & Van den Broeck, 2008, p. 388). In other words, an extrinsic goal or aspiration tends to be associated with less conceptual learning because the individual's cognitive resources are not being directed towards mastery of the task in hand. However, this model of academic achievement relies on the assumption that testing practices 'recompense' students pursuing intrinsic goals or aspirations for their tendency to engage in conceptual learning for, as Vansteenkiste, Simons, Lens, Sheldon, and Deci (2004) point out,

differences in performance between those who take a shallow versus deep approach to learning become insignificant when rote learning (only) is encouraged and forms the basis for assessment. In other words, only when testing is directed towards ascertaining differences in the conceptual learning that individuals have acquired, do advantages accrue to those pursuing intrinsic goals or aspirations. Whether or not the lack of an important relationship between materialism and grades in the current study was connected to the lack of recompense for deeper learning cannot be known as the current study did not examine the extent to which testing rewarded 'deep' versus 'shallow' learning. Nevertheless, such a possibility remains.

Finally, although there was little evidence of an achievement advantage accruing to those who were less materialistic at the within-group level, the between-groups results showed some evidence that being less materialistic was associated with higher academic achievement (see Section 6.1.8). Specifically, materialism scores for the highest performing students (i.e., those in study 1) indicated this cohort was statistically significantly less materialistic than the lower-performing cohort of students (i.e., those in study 2). This result opens the possibility that at the level of life aspirations, the posited advantages to being growth-orientated and less materialistic become more apparent over a longer assessment period. In Ku, Dittmar, and Banerjee (2014, 2014), those who were less materialistic were found to hold a grade-related performance advantage. In these studies, the 'school term' was the period of assessment. How long exactly this was is not clear. If it is assumed it was approximately ten months long, this would make it more than double the duration of the semesters in study 1 and 2. In the current study, it can be hypothesized that over the period of their studies in high school, the less materialistic orientation held by those in study 1 contributed towards participants in that study being focused on learning, less focused on gaining extrinsic rewards, and ultimately better equipped to perform well in the IELTS exam.

6.2.10 The levels of predicted variance

Examining overall model 3 regression models in study 1, results revealed that the amount of variance predicted for coursework, final exams, and semester grades was

approximately 32%, 20%, and 29% respectively (see Chapter 5). In contrast, in study 2, the amount of variance predicted in the model 3 regression models in which mid-term exams, coursework, final exam, and semester grades were the criterion variables was 13%, 11%, 16%, 15% respectively (again, see Chapter 5). In other words, a relatively modest amount of achievement variance was explained in either study, and study 1 accounted for more variance than study 2.

Predictors, rewards, and samples

The amount of explained variance in both studies was modest and may have been affected by issues surrounding the study's predictor variables, the rewards for certain types of learning, and the samples used. As regards the predictors, the ability of the materialism variable to predict variance in achievement may have been affected by the relatively short duration over which performance was assessed (as discussed in Section 3.4.3). For a different reason, the ability of perceived competence to predict achievement variance in study 1 may have been affected by the course's testing environment such that the course's pass/fail reporting of performance led students to reconceptualize their competence perceptions in pass/fail terms (see Section 6.2.6). Similarly, it was suggested in Section 6.2.6 that inflated HSGPAs (English) may have distorted the normally strong relationship between prior and current performance in study 2.

As regards the rewards on offer for learning, the satisfaction of basic needs, it has been argued (see Section 2.9), encourages the deep processing of information (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004) as well as greater creativity (Amabile, 1996). If this is so, one issue is the extent to which these potential cognitive processing advantages were exploitable in terms of grades. If a given exam tests just the shallow processing of information (i.e., more rote learning than conceptual understanding) and if it requires less creativity, it is unlikely that students whose basic needs are satisfied will have their greater interest and deeper involvement in the subject rewarded with better grades. While it is true that it cannot be assumed that the assessments that provide the current study's criterion variables privileged a surface approach to learning, it cannot be dismissed either. Meece, Anderman,

and Anderman (2006) may contend that students' deep-learning is not often tested by common assessment practices (Meece, Anderman, & Anderman, 2006, p. 499), but the extent to which assessments in the current study conform to this characterization and the impact this may have had on how well the study's psychological variables predicted grades is unknown.

As for the sample used, it is possible that a restricted range affected the amount of predicted variance. More specifically, the participants in study 1 and 2 were a sample population grouped on the basis of their similar levels of English language ability.

Reliability of the exams

In order to account for the difference in the amount of explained variance in study 1 compared to 2, it is offered one reason is individual overall achievement in study 2 was assessed across four skills (i.e., four mid-term exams, four coursework scores, four final exams, and four semester grades); hence, a relatively large amount of error (compared to study 1) was potentially introduced into the assessment process. This issue is returned to in Chapter 7.

6.3 Limitations

The current study had a number of limitations. These were methodological, theoretical, and statistical.

First, as indicated above (Section 4.5), small, convenience samples were used. In addition, participants were drawn from just one institution in the UAE. Consequently, there may be limited scope for generalizing beyond the program in the current study (see Section 7.2 for more details).

Second, although data was treated as if it were from one level (i.e., from the EFL program as a whole), it was in fact nested within different classrooms with different teachers. Such potentially important contextual variables (Field, 2009) were not considered.

Third, numerous comparisons were made, which raises the likelihood of Type 1

errors occurring. No Bonferroni correction was made. Given the number of comparisons and the lack of a Bonferroni correction, the level of statistical significance, which was set at $p < 0.01$ may be insufficiently stringent.

Fourth, neither the design of study 1 nor 2 allowed for causality to be established. For instance, bi-directionality between autonomous motives and grades could have encouraged those with lower grades (perhaps informed by their HSGPA or their mid-term exams, in the case of study 2) to choose motives that were least likely to imply *in*competence.

Fifth, the current study used only questionnaires (with the order of questions the same in all cases) to collect data for its criterion variables; hence, the effects of common method bias cannot be ruled out. In addition, the current study is unable to more fully probe why students endorsed a high level of autonomous motives (yet tended to score relatively poorly in exams). Did such students respond poorly to challenge? Was their interest in EFL being driven by grades, as Garon-Carrier *et al.*, (2016) suggest? Was their interest in the course more reactive, more likely to lessen or disappear when the course became more difficult (and their grades were threatened), mirroring what Pulfrey, Darnon, and Butera (2013) term 'task interest'? Could students who strongly endorsed autonomous motives be differentiated according to the intensity and form of engagement they had with EFL outside the classroom? What role did students see EFL playing in their life during and after college? Semi-structured interviews would probably be the most effective data-collection method to answer these kinds of questions. Without such data, the current study is left to speculate why autonomous motives were negatively associated with grades, which is certainly a limitation. In addition, semi-structured interviews might also have more fully illuminated why SES was negatively associated with grades. Specifically, such interviews could have helped establish whether attitudes towards the labour market (and the importance of academic excellence in obtaining a satisfactory position in that market) were connected to differences in nationality or ethnicity within the samples.

Sixth, the questionnaires used in the current study were conceived and developed in cultural and educational contexts very different to those in the UAE. How mean-

ingful such questionnaires are when contexts differ greatly is open to debate. On the one hand, numerous SDT-related studies have shown that SDT questionnaires measuring the importance of autonomy have provided results that meet theoretical expectations in a number of diverse cultural contexts such as China (Zhou, Ma, & Deci, 2011), Korea (Jang, Reeve, Ryan, & Kim, 2009), Germany (Schmuck, Kasser, & Ryan, 2000), and Russia (Ryan *et al.*, 1999). On the other hand, questions concerning the cross-cultural meaningfulness of such measures have been raised by a number of researchers such as Hufton, Elliott, and Illushin (2002), Elliott, Hufton, Hildreth, and Illushin (1999), Pintrich (2003), and Markus and Kitayama (1991). For instance, Elliott, Hufton, Hildreth, and Illushin (1999) found that although students in Sunderland (UK) and Kentucky (USA) often claimed to work hard and achieve high levels of academic performance, their actual work rate and actual level of achievement was less than that in Saint Petersburg (Russia), where students were, paradoxically, less satisfied with their effort and achievement. In addition to these concerns, the PISA data itself also casts some doubt on whether the current study's questionnaires necessarily share cross-cultural meaning. As already discussed in Section 3.4.1 (p. 53), interest at the between-country level is only marginally correlated with Reading scores (where $r = 0.1$). Examining the country-by-country relationship between, for example, interest in Maths and academic performance in PISA (OECD, 2012), the UAE's collective index for student interest approximates to 0.7 yet its achievement scores are amongst the lowest in the OECD. By comparison, the index of student interest in England is 0.21, and in Scotland it is 0.07, yet their achievement scores are above average. What students (and teachers) in the UAE consider to be desirable difficulties (Bjork & Bjork, 2011), how students respond to challenge, how their reference groups (Duckworth & Yeager, 2015) influence their perceptions of suitable levels of work rate, and how they judge (and adapt) their academic performance may all differ according to the context and the current study does not investigate this possibility.

Chapter 7

Conclusions

Section 7.1 is organized by main findings. The implications of these findings for teaching practice are explored and a research agenda for each is suggested. In Section 7.2, the study's weaknesses and the generalizability of its results are outlined.

7.1 Findings, implications, and agendas

In this section, the main findings in the current study; that is, the difference in explained variance between studies, the importance of perceived competence and gender as predictors of grades, the unexpectedly strong relationship between autonomous and controlled motives, autonomous motives as a negative predictor of grades, the relationship between falls in controlled motives and grades, and the negative relationship between SES and grades, are reassessed with regards to their implications for practice. The research agendas they suggest are then outlined.

7.1.1 Scrutinizing exams

Even though study 1 was framed in pass or fail terms, and even though it was arguably seen as a hoop that had to be jumped through, approximately 32 per cent of variance in semester grades was explained by model 3, which compares with the 28 per cent of achievement variance explained in Fortier, Vallerand, and Guay's (1995) SDT-related study. Despite the posited problems associated with the course in study 1, the explained variance was approximately double the amount explained

in study 2. In Section 6.2.10, it was suggested that issues with the criterion variables in study 2 may have been a factor in the relatively low levels of explained variance.

Implications for practice

If the low level of explained variance in study 2 was partly a function of the use of criterion variables that contained elevated levels of error variance, several courses of action are suggested. First, individual test items in the standardized mid-term and final exams could be included (or removed) on the basis of their empirical contribution to the reliability of the respective exams (rather than solely in response to teachers' intuitions about the fairness or appropriateness of an item). Second, efforts should be made to establish agreement concerning what constitutes an appropriate coursework task. Parameters (broad or narrow) need to be delineated if some degree of (presumably desired) consistency across the coursework tasks assigned by different teachers is to be achieved. At present, no such guidelines exist. It should be noted that in the course in study 1, there was greater reliance placed on test statistics to ensure test items were reliable and more coursework tasks were common to all the teachers who taught the course.

The current study could have disaggregated the scores students obtained in each of the four skills. Combining what may have been very different levels of performance in four different skills may have exacerbated issues with the criterion variables.

A research agenda

A future study could retain separate scores for each of the four skills and examine the amount of variance that was predicted with such disaggregated criterion variables. In addition, further examination of coursework scores, the tasks typically set, the grades typically awarded by individual teachers, and the criteria used would be a useful prelude to greater standardization.

7.1.2 Encouraging a learning experience

In study 1, perceived competence was only marginally correlated with grades and was a weak predictor in regression. In study 2, perceived competence was more

strongly correlated and emerged as an important, statistically significant predictor in regression. Differences in the relationship between perceived competence and grades in study 1 and 2, and the strong gender effect in relation to coursework scores in study 1, are taken as indications that the course was not thought of as a valuable learning experience by some of the students. It has been argued that competence perceptions were reframed in pass/fail terms and that this was reflective of how many of the students approached the course: with the intention of obtaining just a pass. In support of this belief, the gender gap in achievement was widest for coursework scores in study 1. If Duckworth and Seligman (2005) are correct and males tend to be less self-disciplined than females, it seems to follow that when the course only demands that a *minimum* score be achieved, students lacking in self-discipline will only engage minimally with the course. In other words, the finding that males tended to complete far fewer coursework tasks than females in study 1 suggests the pass/fail structure of the course had its greatest impact on some of the male students because of their unwillingness, as a function of their lack of self-discipline, to complete these coursework tasks. How can the course be promoted as a worthwhile learning experience? Several possibilities are suggested.

Implications for practice

First, the means of reporting performance in the study 1 course could easily be changed. Instead of a pass or fail award being posted, specific grades (which are readily available) could be given, bringing it into line with the reporting of grades in the Foundation course examined in study 2. By reporting specific grades, inputs and outputs (i.e., the students' efforts and their grades for those efforts) would be better aligned, bolstering the informational quality of the grades and nudging, it is hoped, students towards viewing the course as a less anomalous, more established part of their university experience. Whether this by itself would be sufficient to encourage students to treat it as a valuable learning experience is uncertain. However, there would appear to be few disadvantages to accurately reporting grades.

Second, credits towards the students' college GPA could be awarded (at present, it is a non-credit course) commensurate with performance on the course. However,

this seems to replace one hoop (obtaining a pass) with an even larger one (obtaining a pass and gaining college GPA credits). In terms of SDT, reinforcing an extrinsic reward for learning does not make that reward any more need-satisfying; nor does it encourage deep engagement with the learning material (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004).

Third, if the course lacks *prima facie* validity, its value might be raised by the introduction of authentic material from the students' majors (i.e., some of the actual reading/writing/listening tasks that they will meet in their forthcoming courses). However, the fact that there are students from a large number of disparate majors (such as Engineering, Medicine, Business, Fine Arts) makes finding suitable material problematic given the current composition of the classes.

Lastly, greater emphasis could be placed on coursework and less on mid-term and final exams. At present, final exam accounts for 40 per cent of the semester grade. If the percentage of marks available were less heavily weighted towards such a high-stakes test and more heavily weighted towards smaller, less-high stakes coursework tasks, this might encourage students to engage more with the day-to-day work done in class. Arguably, however, apportioning grades differently would simply replace one or two large 'hoops' (i.e., the mid-term and final exams) with many smaller ones. If many of the students still view the course as one that has to be endured and passed (with the minimum of engagement), then this change in how exams are weighted is unlikely to make a great deal of difference.

Instead, it is how students view the course that perhaps matters most. If the course is to be seen as a learning opportunity, it must also be perceived as having value. Here the literature of interventions that encourage students to connect their course and their learning to a broader purpose in life may offer a way forward. Specifically, results from Yeager *et al.*, (2014) have suggested that intervening to encourage students to find a transcendental purpose for learning, one defined as a motive that brings benefits beyond the self, was associated with better high school GPAs, which were obtained, it was argued, through the transcendental purpose strengthening both the quality of the students' personal goals and the degree of self-discipline that was exercised.

A research agenda

An intervention to develop or strengthen values that extended beyond the self would, it is suggested, be consistent with the value SDT places upon intrinsic goals, and might be expected to have, if Yeager *et al.*'s, (2014) results are a guide, an effect on grades. However, whether this potential grade-related performance benefit would arise from students coming to believe the course was a valuable learning experience or whether it would be a function of greater self-control (or a combination of both) is uncertain. As an instrument to measure the extent to which students valued grades over learning, Black and Deci's (2000) grade orientation questionnaire (discussed in Section 3.2.3) could be usefully employed.

Finally, a gender gap in academic performance was found in both study 1 and 2. However, it was most apparent in study 1 coursework grades. Given one of the posited reasons was the greater self-discipline females showed compared to males in completing all the small tasks that compose the coursework grade, and given the relatively small amount of variance predicted in study 2, a measure of self-discipline as a predictor of grades in a future study might help illuminate more clearly some of the pathways to academic achievement.

7.1.3 A high school environment

Was the course too like high school? The correlations between autonomous and controlled motives were stronger than expected, especially in study 2, resembling those found in other studies where participants were high school (as opposed to university) students and suggesting that the students in the current study experienced the course as controlling. In addition, correlational results indicated that females in study 2 initially reported feeling more controlled than males, with controlled motives (as a non-change variable) at Time 1 higher than at Time 2. One way of explaining this is that the program's attendance policy was resented by the students, especially by the females in study 2. Why should these female students have felt more controlled than the males? One possibility is that the attendance policy was differentially applied on the male and female campuses (for the EFL

course, males and females are taught on separate campuses). This is suggested by the pattern of the absences in study 2. Specifically, the number of recorded absences for females exceeded those for males, with 87.5% of the males recording absences of 10 per cent or less while only 30% of the female students did so. Either the males in study 2 attended their classes more conscientiously than the females or attendance procedures, though nominally identical, differed in practice. The latter is suggested if it is accepted that female attendance in the UAE is generally better than male attendance (Ridge, 2009).

Implications for practice

One obvious course of action to address the potentially controlling aspects of attendance taking would be to abolish it, making attendance the responsibility of the students, rather than the teachers. This offers potential benefits such as engendering in the students a sense of personal responsibility and reducing the time spent by administration on attendance-related issues. However, examining the effects of the abolition of attendance-taking would require institutional-level support, which is unlikely to happen in the near future.

A research agenda

A more feasible line of enquiry would be to establish which factors (apart from attendance-taking) led students to feel controlled. A mixed methods study, combining interviews, classroom observations, and questionnaires, may be best placed to address this question. The next section raises similar issues when a fall in the change variable, for controlled motives, is the topic.

7.1.4 Rationales, acknowledgements, and choices

Study 2 found a negative association between the change variable controlled motives and semester grades, where β = -0.289, p = 0.016 in model 3. In addition, when a group with low coursework scores was compared to a group with high coursework scores, the only motivational variable that was statistically significantly different across the groups was the changes in controlled motives variable. A similar result

was obtained when semester grades were the criterion. In both cases, the effect size approximated to Cohen's (1988) convention for a medium-effect (where d = 0.50).

Implications for practice

The fall in the controlled motives change variable is taken as an indication that some students were able, perhaps through teachers providing rationales, acknowledging feelings, and supplying meaningful choices where possible (Deci, Eghrari, Patrick, & Leone, 1994), to better internalize and integrate external values and so diminish the strength of their controlled motives. These autonomy-supportive teacher actions may have encouraged greater energy and vitality in the students (Nix, Ryan, Manly, & Deci, 1999), which in turn may have allowed the students to exert greater effort (Sheldon & Elliot, 1999; Sheldon & Houser-Marko, 2001) and reap grade-related advantages. SDT also posits that structure, defined as establishing clear expectations, giving direction where required, providing appropriate learning activities, ensuring students remain on task, and regulating behaviour (Jang, Reeve, & Deci, 2010), is important in helping students internalize external values. Was the structure that these teachers were potentially providing associated with falls in controlled motives? If students did feel less controlled by the end of the course in study 2, it is easier to imagine teachers providing adequate structure in their lessons, offering rationales for their decisions, and acknowledging their students feelings than it is to imagine teachers being able to provide many choices (in terms of material to be studied), given the course which they taught featured a pre-determined syllabus. However, this is not to say that choices cannot and were not given.

A research agenda

Consistent with Section 6.2.8, research directed towards establishing and describing whether and how teachers used rationales, acknowledged feelings, and supplied choices where possible to help students internalize and better integrate the external values of the course is suggested. Again, a mixed-method approach may be best suited to this purpose.

7.1.5 Autonomous motives, faking it, and fear appeals

Prima facie, the evidence from the current study suggests that because autonomous motives were negatively associated with academic performance, teachers would be advised to lessen their students' autonomous motives. However, there is little in the extant literature to suggest that this would be advisable. Instead, it seems more likely that in the current study the autonomous motives measure captured other aspects of the students' beliefs, values, or behaviours which impacted grades and explained the negative relationship.

In Section 6.2.7, it was suggested that mastery goals are often pursued for autonomous reasons. It was also suggested that social desirability concerns, found to be associated with to mastery goals (and, it is argued, possibly autonomous motives too), may have encouraged some of the students to report the kinds of motives their teachers were believed to value. Dompnier, Darnon, and Butera (2009) have termed this as 'faking it'. The question is: were some of the students who strongly endorsed autonomous motives also faking it? Were they reporting these motives because they believed their teachers valued them? If so, the focus of these students on external contingencies such as the good opinion of their teachers would seem to have been (paradoxically) detrimental to their performance. Connecting concern with external contingencies with impoverished academic performance has support in the relevant literature. In Black and Deci (2000) grade orientation, which measured the extent to which students focused on grades rather than learning, was negatively associated with grades. Similarly, a focus on extrinsic aspirations, and materialistic ones in particular, was another external contingency that was found to be a negative predictor of academic performance (Ku, Dittmar, & Banerjee, 2012, 2014).

An alternative, but perhaps overlapping, explanation to why autonomous motives and grades were negatively associated is the possibility that weaker ability students consistently endorsed autonomous motives because endorsing such motives avoided having to make normative, performance-related comparisons, ones which were likely to emphasise their relative *in*competence relative to their peers. In other words, the choice of autonomous motives may have been a function of standards of competence and self-worth concerns (Covington, 2000).

A third possibility is that students were punished when they pursued the kind of learning associated with autonomous motives. Specifically, the testing environment did not reward the deep learning posited to be associated with autonomous motives (see Section 1.8).

The final possibility is that autonomous motives were endorsed by students who were more likely to study the course material that they found interesting and little else. As Senko and Miles (2008) suggested, such a divergence of students' and teachers' learning agendas can impact academic achievement. Their results also indicated that those pursuing this divergent learning agenda tended to pursue mastery goals. If mastery goals (in comparison to performance goals) tend to be more strongly associated with a sense of choice and feelings of interest (Benita, Roth, & Deci, 2013), it is possible that those who strongly endorsed autonomous motives also pursued mastery goals and their own learning agendas, to the detriment of their grades.

The implications for teaching

As indicated above, the relevant literature suggests teachers should try, as far as possible, to provide autonomy support for their students. If autonomous motives were associated with a learning agenda that diverged from the teacher's and negatively impacted grades, this raises the question of what can be done to encourage students to follow their interests *and* perform well. As Putwain and Remedios (2014) demonstrated, fear appeals; that is, appeals that reference the negative consequences of not doing what the teacher believes to be necessary for an up-coming, high-stakes exam tend to lower self-determined motivation and diminish performance if students appraise the teacher's comments as a threat, which those with lower perceived competence tend to do. Conversely, if the teacher's comments are appraised as a challenge, which those with higher perceived competence tend to do, then achievement may be encouraged. Putwain, Remedios, and Symes (2015) caution that teachers need to be aware of the impact that their well-intended encouragements have on students.

A research agenda

A major assumption in the current study is that autonomous motives are generally adaptive and would normally be expected to offer students a grade-related performance advantage. Investigating further the reasons why the expected relationship between these motives and grades did not emerge is, consequently, of particular interest. Reassessing students motivational resources, but with the inclusion of instruments to measure mastery and performance goals (i.e., aims) and social desirability and utility concerns, would be an obvious research project.

If interest-based learning agendas were a factor in the negative relationship between autonomous motives and grades, the extent to which such an approach to studying is prevalent or not and its relationship with autonomous motives and grades at the institution in the current study would need to be established as well as the means by which teachers acted (or not) to address the problem. If teachers use fear appeals to encourage students to study the subjects or parts of a course that the students are least interested in, these fear appeals could, in principle, be examined through an SDT-related lens. Specifically, teachers' choice of examples of potential losses, which could be framed in either extrinsic ('you'll lose marks') or intrinsic ('you won't achieve what you are capable of') goal contents terms (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004) or communicated in either controlling or autonomy-supportive language, could be used to classify fear appeals as either need-supportive or need-thwarting, acting to support or undermine students' basic needs and academic performance.

7.1.6 Future orientations and valuing the course

Another of the more unexpected results was the negative relationship found between SES (Scaled) and grades. As Saegert *et al.*, (2007) pointed out, social class often "intersects with race, ethnicity, age, sexual orientation, and (dis)ability" (Saegert et al., 2007, p. 5). In the current study, limited demographic information was obtained from participants. For instance, no information was gathered on the participants' nationality. Given the participants were not just Emiratis but were also from other,

often poorer, nations such as Palestine and Sudan, there is a possibility that SES and nationality may be have been conflated. Some support for this possibility comes from Russell (2012). According to Russell (2012), Emirati males, due to their gender and nationality, hold a privileged position in the UAE relative to Emirati females and non-Emiratis. Although occupying a position of privilege is often associated with access to better resources and greater knowledge about and expectations for achieving academic success (Bourdieu, 1986), Russell's (2012) results indicated that these relatively privileged males were less likely to consider themselves good students or report themselves as working as hard as their non-Emirati peers. In Section 6.2.5, it was speculated that differential access to well-paid and secure government sector jobs and the need for non-Emiratis to compete in a highly-competitive private sector labour market was a potential factor in the results that were obtained.

Implications for practice

If nationality (and hence differential labour-market conditions) were a factor in the negative relationship found between SES and academic achievement, talks from suitable role models who have entered the labour market and who have prospered thanks to their valuing of academic success could be an effective means of encouraging more positive views of learning by helping to extend the students' future time perspective (FTP; Lens, 1986) beyond the immediate present or short-term, and by increasing the perceived value of the students' current actions. In such talks, SDT-related research suggests that the content of the goals that students might be encouraged to pursue should be intrinsic ones (such as personal growth and fulfilment) as opposed to extrinsic (such as earning more money) and that these goals should be as specific as possible (Vansteenkiste, Simons, Soenens, & Lens, 2004). Results from de Bilde, Vansteenkiste, and Lens (2011) indicated that holding strong plans for the future was associated with a host of positive educational outcomes including persistence, concentration, and time management.

It would be a matter of great interest whether interventions in the form of talks on the subject of the importance and benefits of academic striving by who have succeeded in the private sector could encourage a stronger future-time perspective

and bolster academic outcomes for students who face potentially less competitive labour market conditions and who may be most at risk of not valuing their courses as a result. In connection with the problem of dropping out of school, Ridge, Farah, and Shami (2013) have also suggested that role models could play an important role in shaping the perceptions and behaviour of students in the UAE.

A research agenda

The potential link between students' future-time perspectives and labour-market conditions would need to be explored further, as would the relationships between SES, scholarship status, and nationality. If a link between future-time perspective and the different labour-market conditions students believed they faced were established, examining the effects of the intervention suggested above could potentially be a first step towards improving academic performance for some of the groups in the current study.

7.2 Generalizability of findings

There are several issues that arise in attempting to generalize the current study's findings:

1. The comparison of groups in Section 4.12 indicated there were some significant differences between those who did and did not take part. Consequently, there is a need to be cautious in attempting to generalize to other cohorts at the same university attending the same course.

2. The sample was a convenience one. Some students did not take part at all because they were absent at the point of data collection. Their non-inclusion means that obtained results contain, to some degree, a systematic bias. Consequently, there is a need to be cautious in attempting to generalize to other cohorts at the same university attending the same course.

3. The university at which the study was conducted has its own admission policies and requirements, which differ from those of other universities and colleges in the UAE. The non-inclusion of participants from other higher education institu-

tions in the region means that generalizing the current study's results beyond the institution from which participants were drawn is problematic.

4. The UAE is a Middle-Eastern country with a culture, educational system, and labour market that differs considerably, it is suggested, not only from its near neighbours such as Saudi Arabia, but also from the countries that have traditionally featured in much of the educational psychology literature in English; namely, the United Kingdom and the United States. There is reason, therefore, to be cautious about extending the findings of the current study beyond the UAE.

Appendix A

Methodology

A.1 Creating the SES variables

In the PISA 2012 Technical Report (OECD, 2014), three broad elements of SES (occupation, education, and material possessions) were measured. Following this approach, the current study measured occupational status, educational level, and household possessions as indicators of SES.

A.1.1 HISEI

HISEI measured the higher occupational status of either parent (PISA, 2012, p. 307). The HISEI measure consisted of the following questions: Mother's occupation and Father's occupation. Occupations (elicited in the questionnaires at the level of sub-major job category) were mapped onto Ganzeboom's International Socio-Economic Index of Occupational Status index (ISEI) (Ganzeboom & Treiman, 1996) and a score obtained. For instance, a teaching job (recorded as 23) would equate to an ISEI index score of 63.

A.1.2 PARED

PARED measured the higher educational level of either parent (PISA, 2012, p. 307). The PARED measure consisted of the following questions: Mother's educational level (schooling) and father's educational level (schooling), mother's educa-

tional level (post school) and father's educational level (post school). The highest educational level of either parent was expressed as number of years schooling in accordance with the mapping of educational levels and attainment to years schooling in the PISA 2012 Technical Report (OECD, 2014, p. 444). The PISA 2012 Technical Report makes use of ISCED's 1997 coding practice to categorize the various educational programmes and the years of study associated with each. This procedure is followed in study 1. However, in study 2 the most recent coding practice suggested in ISCED (2011) was used instead.

A.1.3 HOMEPOS

HOMEPOS was a measure of household possessions, a proxy of household wealth. The household possessions measure asked participants to indicate whether or not their households possessed 17 common items in total. In addition, participants also indicated the number of phones, televisions, computers, cars and rooms with baths or showers they had in their homes. Lastly, a single item asked participants to quantify the number of books in their homes.

A.1.4 Standardization procedure

To calculate the SES (SW) construct, PISA's (2012) methodology was adopted. This meant that the means and standard deviations of the components of the SES (SW) construct in the current study had first to be standardized in line with means and standard deviations of the ESCS components reported in the PISA (2015) technical report.

A linear transformation was applied to both the means and standard deviations of the current study's HISEI and PARED scores in order to obtain the required standardized means and standard deviations (correct to one decimal place). The HOMEPOS measure, in line with PISA (2012), was not standardized. Below, an example is given in which the HISEI raw score for Study 1 is converted to a standardized score.

The two unknowns in the equation below are 'a' and 'b', which represent the

additive and multiplicative components required to transform the current sample's raw HISEI and PARED means and standard deviations (only).

$$b = \frac{s_{X'}}{s_X}$$
$$a = \bar{X}' - b\,\bar{X}$$

Figure A.1: Linear transformation equation

According to PISA 2015 Test for Schools Technical Report (OECD, 2015, p. 58), the mean for the HISEI variable must equal 50.6655 and the standard deviation must equal 21.6083. In Study 1, the mean for HISEI (raw) was 60.9938, considerably higher than the required mean, and the standard deviation was 11.9213.

Substituting these values into the equations above, b = 21.6083/11.9213 = 1.8126. Consequently, a = 50.6655 - (1.8126*60.9938), which equals -59.8919.

Having computed the values of 'b' and 'a' (in that order), a general linear transformation equation (x' = a + bx) was used to obtain a standardized value (where x' is a standardized value and x is any unstandardized value). Thus the transformation to be applied is: x' = -59.8919 + (1.8126*x), where x = any value of HISEI (raw). Using this procedure, a similar transformation was applied to the raw PARED variable in study 1 and the raw HISEI and PARED variables in study 2 to produce the required standardized versions.

The next step was to examine how the ESCS measure in PISA 2012 Technical Report (OECD, 2014, p. 352) was constructed. In fact, three different factor loadings were applied to each of three broad elements:

ESCS = β1HISEI' + β2PARED' + β3HOMEPOS

The UAE factor loadings – obtained from PISA 2012 technical report (OECD, 2014, p. 352) – were then applied to the new standardized HISEI and PARED measures in order to obtain an appropriately weighted measure. The factor loadings for HISEI, PARED and HOMEPOS were: β1 = 0.80, β2 = 0.82, and β3 = 0.50 respectively. Applying the appropriate factor loadings was the final step in creating the SES (SE) variable in study 1 and 2.

A.1.5 The SES(Average) variable in study 1 and 2

In order to ensure greater parity in the number of items used to construct each of the PARED, HISEI, and HOMEPOS elements, average scores on the 29 items in the HOMEPOS variable were used to rank participants. Rank scores (1-5) on the HOMEPOS element were used to construct a single variable, HOMEPOS (Rank). The SES (Average Score) variable, composed of the PARED, HISEI, and HOMEPOS (Rank) scores, was then computed. It was expected that the SES (Average Score) and SE variables would be highly correlated. Results indicated that the correlation was very strong in study 1, where $r = .997$, $p < .01$ and in study 2, where $r = .995$, $p < .01$ (see Tables A.1 and A.2).

A.1.6 SES Correlation results

Correlation results for the exploratory SES investigation in study 1 and 2 are given in Tables A.1 and A.2. Due to multicollinearity issues such as the strong correlation between SES (Average) and SES (SE), not all the variables presented in these tables were used in the main study.

Table A.1: Study 1 (Group 1) correlations between SES constructs

	SE	SES (Average)	SS	HOMEPOS (raw)	HISEI (raw)	PARED (raw)
SE		[1, 1] a	[0.19, 0.47] a	[0.23, 0.50] a	[0.97, 0.99] a	[0.23, 0.50] a
		]1, 1] b	[0.19, 0.47] b	[0.23, 0.50] b	[0.97, 0.99] b	[0.23, 0.50] b
SES (Average)	.997**a		[-0.02, 0.28] a	[0.02, 0.32] a	[0.97, 0.98] a	[0.30, 0.55] a
	.997**b		[0.14, 0.42] b	[0.18, 0.46] b	[0.97, 0.98] b	[0.29, 0.54] b
SS	.335**a	.136a		[0.95, 0.97] a	[0.05, 0.35] a	None
	.335**b	.289**b		[0.95, 0.97] b	[0.05, 0.35] b	None
HOMEPOS (raw)	.372**a	.171*a	.961**a		[0.08, 0.37] a	None
	.372**b	.325**b	.960**b		[0.08, 0.37] b	None
HISEI (raw)	.981**a	.977**a	.206**a	.234**a		[0.10, 0.39] a
	.981**b	.977**b	.206**b	.234**b		[0.10, 0.39] b
PARED (raw)	.371**a	.435**a	.025a	.062a	.247**a	
	.371**b	.424**b	.055b	.095b	.247**b	

*$p < 0.05$, two-tailed; **$p < 0.01$, two, tailed a = pairwise b = listwise None = correlation below 0.10.

Table A.2: Study 2 (Group 1) correlations between SES constructs

	SE	SES (Average)	SS	HOMEPOS (raw)	HISEI (raw)	PARED (raw)
SE		[0.99, 1] a	[0.25, 0.61] a	[0.06, 0.47] a	[0.97, 0.99] a	[0.34, 0.67] a
		[0.99, 1] a	[0.25, 0.61] b	[0.06, 0.47] b	[0.97, 0.99] b	[0.34, 0.67] b
SES (Average)	.995**a		[0.20, 0.57] a	[-0.05, 0.38] a	[0.98, 0.99] a	[0.32, 0.65] a
	.995**b		[0.19, 0.57] b	[-0.04, 0.40] b	[0.98, 0.99] b	[0.33, 0.67] b
SS	.449**a	.399**a		[0.59, 0.81] a	[0.08, 0.49] a	[0.39, 0.70] a
	.449**b	.395**b		[0.58, 0.81] b	[0.07, 0.49] b	[0.39, 0.70] b
HOMEPOS (raw)	.277*a	.170a	.717**a		[-0.11, 0.33] b	[-0.05, 0.38] a
	.277*b	.187b	.715**b			[-0.06, 0.38] b
HISEI (raw)	.978**a	.989**a	.295**a	.097a		[0.19, 0.57] a
	.978**b	.989**b	.292*b	.114b		[0.19, 0.57] b
PARED (raw)	.526**a	.507**a	.562**a	.173a	.401**a	
	.526**b	.520**b	.563**b	.170b	.401**b	

*$p < 0.05$, two-tailed; **$p < 0.01$, two, tailed a = pairwise b = listwise None = correlation below 0.10.

A.2 Correlational results for Study 2 criterion variables

Due to some concerns over the reliability of the criterion variables in study 2 (the mid-term and final Reading exams), the correlations between the study 2's criterion variables were examined. The results are presented in Table A.3. As this table shows, however, extracting the Reading exam from the criterion variables made little difference to the strength of the correlations between the those exams containing and not containing the Reading exam and the other criterion variables.

Table A.3: Correlations between Study 2's criterion variables

	MID-R	FE-R	SG-R	CW	MID	FE	SG
MID-R		(0.58, 0.8)	(0.85, 0.93)	(0.57, 0.8)	(0.95, 0.98)	(0.62, 0.83)	(0.85, 0.93)
FE-R	0.71**		(0.83, 0.93)	(0.53, 0.78)	(0.61, 0.82)	(0.94, 0.97)	(0.83, 0.93)
SG-R	0.90**	0.89**		(0.8, 0.91)	(0.83, 0.93)	(0.83, 0.93)	(0.98, 0.99)
CW	0.70**	0.67**	0.87**		(0.54, 0.78)	(0.54, 0.78)	(0.79, 0.91)
MID	0.97**	0.73**	0.89**	0.68**		(0.61, 0.82)	(0.86, 0.94)
FE	0.74**	0.96**	0.89**	0.68**	0.73**		(0.86, 0.94)
SG	0.90**	0.89**	0.99**	0.86**	0.91**	0.91**	

*$p < 0.05$, two-tailed; **$p < 0.01$, two, tailed, Mid-R = Midterm exam scores minus Reading, FE-R = Final exam scores minus Reading, SG-R = Semester grade scores minus Reading, CW = Coursework 5 MID = Midterm (with Reading), FE = Final exam (with Reading), SG = Semester grades (with Reading)

A.3 Group differences

A comparison of groups Because a number of students did not complete the questionnaires in study 1 and study 2 or did not provide full academic performance data, a number of mean-difference effect size analyses were conducted to investigate whether the non-inclusion of these students represented a threat to the conclusions that could be drawn from the students who did take part. Below, these comparisons begin with Study 1.

A.3.1 Study 1

A series of comparisons of groups mean scores were run to investigate whether the four groups of students identified above in Study 1 differed significantly from one

another with regard to the relevant variables.

The analysis began with an examination of Group 1 and Group 2 mean differences. Group 1 comprised those students with complete data (N = 166) and Group 2 comprised those with complete data apart from a final exam score (N = 6). A series of standardized mean-difference effect size analyses were conducted with these groups to examine the means of the current study's SES variables and then the means of the psychological variables. A total of 36 students composed Group 3 in the current study. These were students who generated scores for the final exam, semester grade, and teacher coursework but who were absent on the day that the questionnaires were distributed. In other words, from a total of 202 students who provided the required academic performance data, only 166 completed the questionnaires and provided all the requisite academic performance data. Thus the students in Group 3 represented 17.8% of the total number of students with complete academic performance data.

Groups 1 and 2: SES differences

No statistically significant differences were found between Group 1 and Group 2 in their mean difference scores for the PARED (raw) and HOMEPOS (raw) variables. However, analysis indicated the difference between Group 1's HISEI (raw) mean score (M = 60.99, SD = 11.9) and Group 2's HISEI (raw) score (M = 45.83, SD = 13.6) was associated with a large effect size, where Hedges' g = 1.26, 95% CI [0.44, 2.09]; that is, an effect size that was found to exceed Cohen's (1988) convention for a large effect (d = .80). This result indicated that the parental job status of those students who completed the questionnaire but who did not sit the final exam was significantly lower than the parental job status of those students who completed the questionnaire and sat the final exam. Four of the six students in Group 2 did not complete the final because they had reached the 20% non-attendance limit. This could be taken as an indication that a low HISEI (raw) score is a useful predictor of dropout. However, no further data is available for the Group 3 students (N = 9) who also dropped out, so the number of dropouts contained in Group 2 provides a very small sample from which to draw any conclusions. Thus the possibility

that a low HISEI (raw) score may be one important factor associated with dropout in the current study remains uncertain. As for the importance of the difference between Group 1 and Group 2's HISEI (raw) scores, the HISEI (raw) variable was only included in later regression analysis as one of three standardized variables that composed the SES (SE) measure. In other words, a statistically significant difference existed in only one of the three variables that together composed this SES measure.

Groups 1 and 2: psychological variable differences

Results indicated that Group 1's mean scores were greater for each of the four variables (autonomous motives, controlled motives, perceived competence, and materialism – where Group 1 had a larger negative mean score than Group 2, indicating a less materialistic orientation). However, none of the effect sizes were statistically significant.

Group 1 and Group 3: Academic performance differences

In order to ascertain whether or not the academic performance for Group 1 students differed significantly from Group 3 students, a series of standardized mean-difference effect size analyses were conducted. Analysis of the difference in means between Group 1 and Group 3's semester and coursework grade scores indicated the differences were substantive and statistically significant, but this was not the case for final exam grades. The difference between Group 1's semester grade mean score (M = 66.34, SD = 10.41) and Group 3's semester grade mean score (M = 60.42, SD = 8.58) was associated with a statistically significant medium effect size, where Hedges' g = 0.58, 95% CI [0.22, 0.95]; that is, one that was found to approximate to Cohen's (1988) convention for a medium effect (d = .50). The difference between Group 1's coursework grades mean score (M = 78.64, SD = 11.56) and Group 3's coursework grades mean score (M = 65.44, SD = 16.08) was associated with a statistically significant large effect size, where Hedges' g = 1.05, 95% CI [0.68, 1.43]; that is, one that was found to exceed Cohen's (1988) convention for a large effect (d = .80).

Summary

In study 1, the mean-difference effect size analyses indicated that the parental job status of students in Group 1 were significantly higher that those of Group 2. In addition, the academic performance of students in Group 1 (as measured by semester grades and coursework) was significantly higher than that of Group 3 (N = 36). The possibility thus arises that had Group 3 students been present when the survey was administered, their academic performance might have altered the relationship between academic performance and the study's predictor variables. This result has implications for the generalizability of the current study's results.

A.3.2 Study 2

In order to investigate whether the seven groups of students identified in Table 4.2 differed significantly from one another with regard to Study 2's academic performance, SES, and psychological measures, a series of standardized mean-difference effect size analyses were conducted. These began with an examination of academic performance differences.

Semester grades: Groups 1, 3, and 5

Only these groups were considered for semester grades analysis because only these groups provided complete academic performance data. Results indicated that the standardized mean-difference effect size between Group 1's semester grades (M = 74.35, SD = 7.54) and Group 3's semester grades (M = 70.52, SD = 8.14) was not statistically significant. Results also indicated that the standardized mean-difference effect size between Group 1 and Group 5's Overall score (M = 76.02, SD = 8.73) was not statistically significant.

Final exam performance: Groups 1, 3, and 5

Results indicated that the standardized mean-difference effect size between Group 1's final exam scores (M = 67.79, SD = 9.01) and Group 3's final exam scores (M = 63.72, SD = 8.64) was not statistically significant. Results also indicated that Group

1 and Group 5's final exam scores (M = 70.49, SD = 10.67) were not statistically significantly different.

Mid-term exam performance: Groups 1, 2, 3, 4, 5, and 6

Results indicated that the standardized mean-difference effect size between Group 1's mid-term exam scores (M = 76.50 SD = 8.98) and Group 2's mid-term exam scores (M = 74.94, SD = 11.76) was not statistically different. Results also indicated that Group 1 and Group 3's (M = 73.47, SD = 10.71) mean-difference effect size did not statistically significantly differ. In addition, Group 1 and Group 4's mid-term exam results (M = 80.20, SD = 9.55); Group 1 and Group 5's mid-term exam results (M = 77.43, SD = 9.86); and Group 1 and Group 6's (M = 83.00, SD = 14.14) mid-term exam results did not statistically significantly differ.

Coursework scores: Groups 1, 3 and 5

Results indicated that the standardized mean-difference effect size between Group 1's coursework score (M = 78.77, SD = 7.29) and Group 3's coursework score (M = 74.37, SD = 8.06) was statistically significant, where Hedges' g = 0.59, 95% CI [0.05, 1.14]; that is, one that was found to approximate to Cohen's (1988) convention for a medium effect (d = 0.50). However, results also indicated that the standardized mean-difference effect size between Group 1's coursework score (M = 74.35, SD = 7.54) and Group 5's coursework score (M = 80.14, SD = 7.56) was not statistically significant.

Psychological variables at T1: Groups 1 to 4

A series of standardized mean-difference effect size analyses (twelve in total) were conducted using the study's psychological variables in order to compare differences in Group 1 means and the means of the three other groups at T1. Results indicated that standardized mean-difference effect sizes across all the psychological variables were not statistically significantly different.

Psychological variables at T2: Groups 1 and 2

A series of standardized mean-difference effect size analyses (four in total) were conducted with these groups to examine potential differences in the means of the current study's psychological variables at T2. No statistically significant effect size differences were found.

SES differences: Groups 1, 2, 3, and 4

A series of standardized mean-difference effect size analyses were conducted. Results indicated that standardized mean-difference effect sizes across all the SES variables were not statistically significantly different.

Summary

In summary, in study 2, few statistically significant differences between groups were found. Indeed, standardized mean effect size analysis indicated that only Group 1's coursework scores were statistically significantly higher than Group 3's. Had students from Group 3 (N = 16) provided completed the questionnaires at Time 2, the current results suggest that the relationship between coursework scores and other variables may have been altered somewhat. This result has implications for the generalizability of study 2's results.

A.4 Missingness results

In order to investigate the values that were missing in the questionnaires, an investigation of 'missingness' was conducted. This was performed for Group 1 in study 1 and study 2 only. When the 'missingess' variable is significantly predicted in regression, this is an indication that there is systematic bias in the data, which potentially impacts the reliability of the results that were obtained. As a means of addressing the problem of missingness, additional data sets were created using imputation procedures. The current study used a total of eight (imputed and non-imputed) data sets to examine results.

A.4.1 Study 1 and missingness

First, a propensity score for missingness was calculated by examining the data sets for completeness. A dichotomous missingness variable consisting of two dimensions – complete and incomplete data provision – was then created. Several variables for which there was complete data were then examined as potential predictors of missingness. These potential predictor variables were gender, student ages, and attendance. Correlational analysis (two-tailed, listwise) revealed that only gender was statistically significantly correlated with missingness, $r(166) = 0.182$, $p < 0.05$. Missingness was investigated further using logistic regression analysis.

With gender, age, and attendance as forced entry predictors, results from logistic regression analysis indicated that a test of the full model against a constant only model was statistically significant, meaning that the predictors as a set distinguished between 'missing' and 'not missing' data (chi square = 8.361, $p < 0.05$, with df = 3). Cox and Snell's R-squared of 0.049 indicated a small relationship between prediction and grouping. Prediction success overall was 66.1 per cent (78 per cent for 'missing' and 51 per cent for 'non-missing'). The Wald criterion demonstrated that only gender made a significant contribution to the prediction of missingness (p < 0.05). The $Exp(B)$ value of 0.416 indicated that when gender was raised by one unit (from female to male), the odds of missingness occurring was reduced, with age and attendance held constant. Therefore, males were less likely to provide a questionnaire that had missing data than females when age and attendance were controlled. The reasons for this are not clear. HSGPA was the variable from which data was most frequently missing with 64 missing cases (39 per cent) in HSGPA (English) and 20 missing cases (12 per cent) in HSGPA (All subjects). Females may have been less willing to guestimate an ill-remembered HSGPA score than males, may not have remembered their actual grade as well as males, or may have felt less compelled by image management concerns to report a grade that may not have been accurate.

A.4.2 Study 2 and missingness

In study 2, the propensity to provide missing data was again considered. Two definitions of missingness were used.

Missing data at Time 2

First, missingness was defined as 'being present at both T1 and T2 but proving only a partially completed questionnaire at either or both of these times'. The analysis was conducted using Group 1 participants only. The potential predictor variables of missingness were gender, student ages, and attendance. Correlational analysis (two-tailed, listwise) revealed that gender, ages, and attendance were not statistically significantly correlated with missingness. Missingness was further investigated using logistic regression analysis.

With gender, age, and attendance as forced entry predictors, results from logistic regression analysis indicated that a test of the full model against a constant only model was not statistically significant, meaning that the predictors as a set did not distinguish between 'missing' and 'not missing' data (chi square = 4.432, $p = 0.218$, with df = 3). Cox and Snell's R-squared of 0.054 indicated a small relationship between prediction and grouping. Prediction success overall was not raised beyond the initial level of 81.3 per cent. The Wald criterion demonstrated that none of the predictors made a statistically significant contribution to prediction.

Non-completion of the questionnaires at Time 2

Second, missingness was also defined as 'non-completion of the questionnaires at T2'. The predictor variables were once again age, gender, and attendance. Participants in all the study's groups were included (N = 108). Missingness was statistically significantly correlated with coded absences, $r(108) = 0.533$, $p < 0.01$), but not gender or age. Missingness was investigated further using logistic regression analysis.

Using logistic regression analysis to predict missingness with gender, age, and attendance as forced entry predictors, results indicated that a test of the full model against a constant only model was statistically significant, meaning that the predictors as a set distinguished between 'missing' and 'not missing' data (chi square

= 46.566, $p < 0.001$, with df = 3). Cox and Snell's R-squared of 0.350 indicated a moderate relationship between prediction and grouping. Prediction success overall was 85.2 per cent (95.1 per cent for 'not missing' and 53.8 per cent for 'missing'). The Wald criterion demonstrated that gender ($p < 0.01$) and coded absence (textitp < 0.01) made a significant contribution to prediction. Furthermore, the $Exp(B)$ value indicated that when gender was raised by one unit (from female to male), the odds ratio of missingness occurring was raised by a factor of 18.52, with age and attendance held constant. In addition, the $Exp(B)$ value indicated that when coded absence was raised by one unit, the odds of missingness occurring were raised 10.13 times, with age and gender held constant.

That males were 18.52 times more likely not to provide T2 data (i.e., complete the questionnaires at Time 2 having completed them at Time 1) than females when age and attendance were held constant is in accord with the data collection circumstances at T2. Unlike the female students, many of the male students had chosen to not to attend any of their classes towards the end of the term when the second wave of data was collected. Their stated motive was to study for the final exam.

A.5 Questionnaires

The questionnaires in English are presented first, followed by their Arabic translations.

Basic demographics

A. Please indicate your gender

(1) Female

(2) Male

B. Please indicate your age

(1) Less than 18

(2) 18 through 22

(3) More than 22

C. Please indicate your marital status

(1) Single

(2) Married

(3) Other

D. Please write your most recent TOEFL or IELTS score

TOFEL _____

IELTS _____

E. Please write your High School GPA

ENGLISH _____

ALL SUBJECTS _____

Figure A.2: Basic demographic information: gender, age, HSGPA, and IELTS or TOEFL score

Job list

Please write the code number in English on the *PISA student background questionnaire*

*(For example, if you mother is/was a teacher, you would write '**23**' as the code. If your father is/was a salesman, you would write '**52**')*

Armed Forces occupations
- 01 Commissioned Armed Forces Officers
- 02 Non-commissioned Armed Forces Officers
- 03 Armed Forces Occupations, Other ranks

Managers
- 11 Chief executives
- 12 Administrative and Commercial Managers
- 13 Production and Specialized Services Managers
- 14 Hospitality, Retail and Other Services Managers

Professionals
- 21 Science and Engineering Professionals
- 22 Health Professionals
- 23 Teaching Professionals
- 24 Business and Administration Professionals
- 25 Information and Communications Technology Professionals
- 26 Legal, Social and Cultural professionals

Technicians and Associate Professionals
- 31 Science and Engineering Associate Professionals
- 32 Health Associate Professionals
- 33 Business and Administration Associate Professionals
- 34 Legal, Social, Cultural and Related Associate Professionals
- 35 Information and Communications Technicians

Clerical Support Workers
- 41 General and Keyboard Clerks
- 42 Customer Services Clerks
- 43 Numerical and Material Recording Clerks
- 44 Other Clerical Support Workers

Services and Sales Workers
- 51 Personal Services Workers
- 52 Sales Workers
- 53 Personal Care Workers
- 54 Protective Services Workers

Skilled Agricultural, Forestry and Fishery Workers
- 61 Market-oriented Skilled Agricultural Workers
- 62 Market-oriented Skilled Forestry, Fishery and Hunting Workers
- 63 Subsistence Farmers, Fishers, Hunters and Gatherers

Craft and Related Trades Workers
- 71 Building and Related Trades Workers (excluding Electricians)
- 72 Metal, Machinery and Related Trades Workers
- 73 Handicraft and Printing Workers
- 74 Electrical and Electronic Trades Workers
- 75 Food Processing, Woodworking, Garment and Other Craft and Related Trades Workers

Plant and Machinery Operators and Assemblers
- 81 Stationary Plant and Machine Operators
- 82 Assemblers
- 83 Drivers and Mobile Plant Operators

Elementary Occupations
- 91 Cleaners and Helpers
- 92 Agricultural, Forestry and Fishery Laborers
- 93 Laborers in Mining, Construction, Manufacturing and Transport
- 94 Food Preparation Assistants
- 95 Street and Related Sales and Services Workers
- 96 Refuse Workers and Other Elementary Workers

Figure A.3: List of occupations (1)

PISA Student background questionnaire

In this section, you will be asked some questions about your family and your home. Some of the following questions are about your mother and father or those persons who are like a mother or father to you – for example, guardians, step-parents, foster parents, etc. If you share your time with more than one set of parents or guardians please answer the following questions for those parents/guardians you spend the most time with.

Q1 Who usually lives at home with you?
(Please circle one choice in each row.)

a) Mother (including stepmother or foster mother)	Yes	No
b) Father (including stepfather or foster father)	Yes	No
c) Brother(s) (including stepbrothers)	Yes	No
d) Sister(s) (including stepsisters)	Yes	No
e) Grandparent(s)	Yes	No
f) Others (e.g. cousins)	Yes	No

Q2 What is your mother's main job?
(If she is not working now, please tell us her last main job.)

Please refer to the job sheet and write the code number for her job in English here. _____

Q3 What is the highest level of schooling completed by your mother?
(Please circle only one.)

a) Secondary education (upper - providing access to university)
b) Secondary education (technical)
c) Secondary education (lower)
d) Primary education
e) She did not complete primary school

Q4 Does your mother have any of the following qualifications?
(Please circle only one.)

a) Post-graduate (e.g., Masters, doctorate)
b) University level (e.g., Bachelors)
c) Non-university tertiary level (e.g., Diploma)
d) Non-tertiary post-secondary
e) None

Q5 What is your mother currently doing?
(Please circle only one.)

a) Working full-time
b) Working part-time
c) Not working but looking for work
d) Other (e.g., home duties, retired)

Q6. What is your father's main job?
(If he is not working now, please tell us his last main job.)

Please refer to the job sheet and write the code number for his job in English here. _____

Figure A.4: PISA (p. 1)

Q7 What is the highest level of schooling completed by your father?
(Please circle only one.)

a) Secondary education (upper - providing access to university)
b) Secondary education (technical)
c) Secondary education (lower)
d) Primary education
e) He did not complete primary school

Q8 Does your father have any of the following qualifications?
(Please circle only one.)

a) Post-graduate (e.g., Masters, doctorate)
b) University level (e.g., Bachelors)
c) Non-university tertiary level (e.g., Diploma)
d) Non-tertiary post-secondary
e) None

Q9 What is your father currently doing?
(Please circle only one.)

a) Working full-time
b) Working part-time
c) Not working but looking for work
d) Other (e.g., home duties, retired)

Q10 Which of the following are in your home?
(Please circle one in each row.)

a) A desk to study at	*Yes*	*No*
b) A room of your own	*Yes*	*No*
c) A quite place to study	*Yes*	*No*
d) A computer you can use for school work	*Yes*	*No*
e) Educational software	*Yes*	*No*
f) A link to the Internet	*Yes*	*No*
g) Classic literature	*Yes*	*No*
h) Books of poetry	*Yes*	*No*
i) Works of art (e.g., paintings)	*Yes*	*No*
j) Books to help with your school work	*Yes*	*No*
k) Technical reference books	*Yes*	*No*
l) A dictionary	*Yes*	*No*
m) A dishwasher	*Yes*	*No*

Figure A.5: PISA (p. 2)

n) A DVD player	*Yes*	*No*
o) A laptop of your own	*Yes*	*No*
p) Electronic games (e.g., Wii, Xbox)	*Yes*	*No*
q) iPad	*Yes*	*No*

Q11 How many of these are there in your home?
(Please circle only one in each row)

a) Cellular phone	*None*	*One*	*Two*	*Three or more*
b) Televisions	*None*	*One*	*Two*	*Three or more*
c) Computers	*None*	*One*	*Two*	*Three or more*
d) Cars	*None*	*One*	*Two*	*Three or more*
e) Rooms with a bath or shower	*None*	*One*	*Two*	*Three or more*

Q12 How many books are there in your home?
(There are usually about 40 books per metre of shelving. Do not include magazines, newspapers, or your schoolbooks)

(Please circle only one.)

a) 1-10 books
b) 11-25 books
c) 26-100 books
d) 101 – 200 books
e) 201-500 books
f) More than 500 books

Figure A.6: PISA (p. 3)

Aspirations

Everyone has long-term Goals or Aspirations. These are the things that individuals hope to accomplish over the course of their lives. In this section, you will find a number of life goals, presented one at a time, and we ask you a question about each goal. The question is: How important is this goal to you? Please use the following scale in answering each of the questions about each life goal. PLEASE CIRCLE YOUR CHOICES.

1	2	3	4	5	6	7
not at all true			somewhat true			very true

1. Life-goal: To be a very wealthy person.

How important is this to you?

1 2 3 4 5 6 7

2. Life-goal: To grow and learn new things.

How important is this to you?

1 2 3 4 5 6 7

3. Life-goal: To have my name known by many people.

How important is this to you?

1 2 3 4 5 6 7

4. Life-goal: To have good friends that I can count on.

How important is this to you?

1 2 3 4 5 6 7

5. Life-goal: To successfully hide the signs of aging.

How important is this to you?

1 2 3 4 5 6 7

6. Life-goal: To work for the betterment of society.

How important is this to you?

1 2 3 4 5 6 7

7. Life-goal: To have many expensive possessions.

How important is this to you?

1 2 3 4 5 6 7

8. Life-goal: To be able to look back on my life as meaningful and complete.

How important is this to you?

1 2 3 4 5 6 7

9. Life-goal: To be admired by many people.

How important is this to you?

1 2 3 4 5 6 7

10. Life-goal: To share my life with someone I love.

How important is this to you?

1 2 3 4 5 6 7

Figure A.7: Aspirations Index (p. 1)

11. Life-goal: To have people comment often about how attractive I look.

How important is this to you?

1 2 3 4 5 6 7

12. Life-goal: To assist people who need help, asking nothing in return.

How important is this to you?

1 2 3 4 5 6 7

13. Life-goal: To be financially successful.

How important is this to you?

1 2 3 4 5 6 7

14. Life-goal: To choose what I do, instead of being pushed along by life.

How important is this to you?

1 2 3 4 5 6 7

15. Life-goal: To be famous.

How important is this to you?

1 2 3 4 5 6 7

16. Life-goal: To have committed, intimate relationships.

How important is this to you?

1 2 3 4 5 6 7

17. Life-goal: To keep up with fashions in hair and clothing.

How important is this to you?

1 2 3 4 5 6 7

18. Life-goal: To work to make the world a better place.

How important is this to you?

1 2 3 4 5 6 7

19. Life-goal: To be rich.

How important is this to you?

1 2 3 4 5 6 7

20. Life-goal: To know and accept who I really am.

How important is this to you?

1 2 3 4 5 6 7

21. Life-goal: To have my name appear frequently in the media.

How important is this to you?

1 2 3 4 5 6 7

22. Life-goal: To feel that there are people who really love me, and whom I love.

How important is this to you?

1 2 3 4 5 6 7

23. Life-goal: To achieve the "look" I've been after.

How important is this to you?

1 2 3 4 5 6 7

Figure A.8: Aspirations Index (p. 2)

24. Life-goal: To help others improve their lives.

How important is this to you?

1 2 3 4 5 6 7

25. Life-goal: To have enough money to buy everything I want.

How important is this to you?

1 2 3 4 5 6 7

26. Life-goal: To gain increasing insight into why I do the things I do.

How important is this to you?

1 2 3 4 5 6 7

27. Life-goal: To be admired by lots of different people.

How important is this to you?

1 2 3 4 5 6 7

28. Life-goal: To have deep enduring relationships.

How important is this to you?

1 2 3 4 5 6 7

29. Life-goal: To have an image that others find appealing.

How important is this to you?

1 2 3 4 5 6 7

30. Life-goal: To help people in need.

How important is this to you?

1 2 3 4 5 6 7

Figure A.9: Aspirations Index (p. 3)

Perceived Competence for Learning

Please respond to each of the following items in terms of how true it is for you with respect to your learning in this course. Use the scale below. PLEASE CIRCLE YOUR CHOICES.

1	2	3	4	5	6	7
not at all true			somewhat true			very true

1. I feel confident in my ability to learn this material.
   1 2 3 4 5 6 7
2. I am capable of learning the material in this course.
   1 2 3 4 5 6 7
3. I am able to achieve my goals in this course.
   1 2 3 4 5 6 7
4. I feel able to meet the challenge of performing well in this course.
   1 2 3 4 5 6 7

Figure A.10: Perceived Competence Scale

SRQ-A: Why I do things

Please think carefully and circle your choice.

A. Why do I do my homework?

1. Because I want the teacher to think I'm a good student.

Very true Sort of true Not very true Not true at all

2. Because I'll get in trouble if I don't.

Very true Sort of true Not very true Not true at all

3. Because it's fun.

Very true Sort of true Not very true Not true at all

4. Because I will feel bad about myself if I don't do it.

Very true Sort of true Not very true Not true at all

5. Because I want to understand the subject.

Very true Sort of true Not very true Not true at all

6. Because that's what I'm supposed to do.

Very true Sort of true Not very true Not true at all

7. Because I enjoy doing my homework.

Very true Sort of true Not very true Not true at all

8. Because it's important to me to do my homework.

Very true Sort of true Not very true Not true at all

B. Why do I work on my classwork?

9. So that the teacher won't yell at me.

Very true Sort of true Not very true Not true at all

10. Because I want the teacher to think I'm a good student.

Very true Sort of true Not very true Not true at all

11. Because I want to learn new things.

Very true Sort of true Not very true Not true at all

12. Because I'll be ashamed of myself if it didn't get done.

Very true Sort of true Not very true Not true at all

13. Because it's fun.

Figure A.11: Self-Regulation Questionnaire - Academic (p. 1)

Very true *Sort of true* *Not very true* *Not true at all*

14. Because that's the rule.

Very true *Sort of true* *Not very true* *Not true at all*

15. Because I enjoy doing my classwork.

Very true *Sort of true* *Not very true* *Not true at all*

16. Because it's important to me to work on my classwork.

Very true *Sort of true* *Not very true* *Not true at all*

C. Why do I try to answer hard questions in class?

17. Because I want the other students to think I'm smart.

Very true *Sort of true* *Not very true* *Not true at all*

18. Because I feel ashamed of myself when I don't try.

Very true *Sort of true* *Not very true* *Not true at all*

19. Because I enjoy answering hard questions.

Very true *Sort of true* *Not very true* *Not true at all*

20. Because that's what I'm supposed to do.

Very true *Sort of true* *Not very true* *Not true at all*

21. To find out if I'm right or wrong.

Very true *Sort of true* *Not very true* *Not true at all*

22. Because it's fun to answer hard questions.

Very true *Sort of true* *Not very true* *Not true at all*

23. Because it's important to me to try to answer hard questions in class.

Very true *Sort of true* *Not very true* *Not true at all*

24. Because I want the teacher to say nice things about me.

Very true *Sort of true* *Not very true* *Not true at all*

D. Why do I try to do well in class?

25. Because that's what I'm supposed to do.

Very true *Sort of true* *Not very true* *Not true at all*

26. So my teachers will think I'm a good student

Very true *Sort of true* *Not very true* *Not true at all*

27. Because I enjoy doing my school work well.

Figure A.12: Self-Regulation Questionnaire - Academic (p. 2)

Very true *Sort of true* *Not very true* *Not true at all*

28. Because I will get in trouble if I don't do well.

Very true *Sort of true* *Not very true* *Not true at all*

29. Because I'll feel really bad about myself if I don't do well.

Very true *Sort of true* *Not very true* *Not true at all*

30. Because it's important to me to try to do well in class.

Very true *Sort of true* *Not very true* *Not true at all*

31. Because I will feel really proud of myself if I do well.

Very true *Sort of true* *Not very true* *Not true at all*

32. Because I might get a reward if I do well.

Very true *Sort of true* *Not very true* *Not true at all*

Figure A.13: Self-Regulation Questionnaire - Academic (p. 3)

البيانات العامة

يرجى اختيار الجنس
(1) انثى
(2) ذكر

يرجى أختيار العمر

(1) أقل من 18

(2) 18 إلى 22

(3) أكثر من 22

يرجى أختيار الحالة الاجتماعية

(1) أعزب \عزباء

(2) متزوج \ متزوجة

(3) أخرى

يرجى كتابة أحدث نتيجة سواءا للتوفل (**TOEFL**)أوللايلتس (**IELTS**)

)**1**(توفل)**TOEFL**(_____

)2(ايلتس (**IELTS**)_____

يرجى كتابة معدل الثانوية العامة

(1) اللغة الانجليزية_____

(2) جميع المواد _____

Figure A.14: Basic demographic information: gender, age, HSGPA, and IELTS or TOEFL score

قائمة الوظائف

يرجى كتابة رقم الرمز باللغة الإنجليزية على استبيان خلفية الطالب

(على سبيل المثال، إذاكانت وظيفة الوالدة معلمة،ستكتب '23' كرمز. إذا كان والدك يعمل أو كان يعمل بائعا، ستكتب '52')

مدراء
11 رؤساء تنفيذيون
12 مدراء إداريين وتجاريين
13 مدراء الإنتاج والخدمات المتخصصة
14 مدراء الضيافة والتجزئة وخدمات أخرى

المهنيين/الاختصاصيين
21 اختصاصيين العلوم والهندسة
22 اختصاصيين المهن الصحية
23 مختصين في مجال التدريس
24 مختصين في الأعمال والادارة
25 اختصاصيون في تكنولوجيا المعلومات والاتصالات
26 اختصاصيون في المهن القانونية والاجتماعية والثقافية

الفنيون والاختصاصيين المساعدين (المشاركين)
31 مختص مشارك في العلوم والهندسة
32 مختص مشارك في المهن الصحية
33 مختص مشارك في الأعمال والإدارة
34 مختص مشارك في المهن القانونية والاجتماعية والثقافية وما يتصل بها
35 فنيي المعلومات والاتصالات

مساعدين إداريين
41 موظفي ادارةعامة وإدخال بيانات
42 موظفي خدمة العملاء
43 موظفي تسجيل البيانات العددية(الرقمية)والمواد
44 موظفي دعم مهام إدارية أخرى

موظفي الخدمات والمبيعات
51 موظفي الخدمات الشخصية
52 موظفي المبيعات
53 موظفي العناية الشخصية
54 موظفي خدمات الحمايةوالأمن

العمال المهرة في الزراعة والغابات ومصايد الأسماك
61 عمال مهرةفي الزراعةالموجهةللسوق
62 عمال مهرةفي أعمال الغابات و الصيد و مصائد الأسماك الموجهة للسوق
63 مزارعين ,صيادين سمك ,صيادين حيوانات وجامعي الثمار للاكتفاء الذاتي

عمال الحرف والمهن ذات الصلة
71 عمال البناء والمهن ذات العلاقةبالإعمار (باستثناء الكهربائيين)
72 عمال المعادن والماكينات والمهن ذات الصلة
73 عمال الحرف اليدوية والزخرفة
74 عما الكهرباء والالكترونيات
75 عمال تجهيز الأغذية،النجارةو الملابس وغيرها من الحرف وما اليها من المهن

Figure A.15: List of occupations (1)

مشغلي المصانع والآلات ومجمعوها
81 مشغلوالمنشآت الثابتةوالآلات
82 مجمعو الآلات
83 سائقون ومشغلون للمنشآت المتنقلة

المهن الأولية (البسيطة)
91 عمال النظافة والمساعدون
92 عمال الزراعة والغابات ومصائد الأسماك
93 عمال المناجم والبناء والتصنيع والنقل
94 مساعدين إعداد الطعام
95 عمال شوارع والمبيعات ذات صلة والخدمات العمالية
96 عمال النفايات/ القمامةو مهن أولية أخرى

مهن القوات المسلحة
01 ضباط القوات المسلحة المكلفة
02 ضباط القوات المسلحة الغير مكلفة
03 مهن في القوات المسلحة ورتب عسكرية أخرى

Figure A.16: List of occupations (2)

استبيان عن خلفية الطالب/ الطالبة

في هذا الجزء، سوف يطلب منك الإجابة عن بعض الأسئلة التي تخص عائلتك ومنزلك. بعض من الأسئلة التالية تتعلق بوالدك ووالدتك أو الأشخاص الذين هم بمثابة الأم أو الأب لك على سبيل المثال الأوصياء،زوج الأم, زوجة الأب أو الأمهات والآباء بالتبني. في حال كنت تقضي معظم وقتك مع فئة من الفئات السابق ذكرها من الآباء والأمهات أو الأوصياء يرجى الإجابة على الأسئلة التالية لهؤلاء الآباء / الأمهات/أو الأوصياء.

س 1 . من الذي يعيش عادة معك في المنزل؟

(يرجى وضع دائرة حول كل خيار في كل صف)

أ) الأم (بما في ذلك زوجة الأب أو الحاضنة)	نعم	لا
ب) الأب (بما في ذلك زوج الأم أوالوالد بالوصاية)	نعم	لا
ج) الأخوة (بما في ذلك أبناء زوج الأم أو زوجة الأب)	نعم	لا
د) الأخوات (بما في ذلك بنات زوج الأم أو زوجة الأب)	نعم	لا
ه) الجد والجدة	نعم	لا
و) آخرون (مثل أبناء العم/العمة/الخال/الخالة)	نعم	لا

س 2 . ما هي وظيفة والدتك الرئيسية؟

(إذا كانت لا تعمل الآن, الرجاء ذكر آخر وظيفة رئيسية لها)

يرجى الرجوع إلى لائحة الوظائف، وكتابة رقم رمز لوظيفتها باللغة الإنجليزية هنا _____

س 3. ما هو أعلى مستوى تعليم دراسي حصلت عليه والدتك؟

(يرجى وضع دائرة واحدة فقط)

(أ) تعليم ثانوي (ثانوية عامة تؤهل للدخول إلى الجامعة)

(ب) تعليم ثانوي (مهني)

(ج) تعليم ثانوي (أدنى)

د) تعليم إبتدائي

ه) لم تكمل الدراسة الابتدائية

Figure A.17: PISA (p. 1)

س 4. هل لدى والدتك أي من المؤهلات التالية؟

(يرجى وضع دائرة واحدة فقط)

(أ) دراسات عليا (على سبيل المثال، الماجستير، الدكتوراه)

(ب) مؤهل جامعي (على سبيل المثال، البكالوريوس)

(ج) دراسات غير جامعية ذات المستوى العالي (على سبيل المثال، دبلوم)

(د) تعليم غير عالي بعد الثانوية

ه) لا مؤهلات

س 5. ماذا تعمل والدتك حاليا؟

(يرجى وضع دائرة واحدة فقط)

(أ) تعمل بدوام كامل

(ب) تعمل بدوام جزئي

(ج) لا تعمل ولكن تبحث عن عمل

(د) أخرى (على سبيل المثال متقاعدة أو ربة منزل)

س 6. ما هي وظيفة والدك الرئيسية ؟

(إذا كان لا يعمل الآن، الرجاء ذكر آخر وظيفة رئيسية له)

يرجى الرجوع إلى لائحة الوظائف، وكتابة رقم رمز لوظيفته باللغة الإنجليزية هنا_____

س 7. ما هو أعلى مستوى من التعليم المدرسي أنهاه والدك؟

(يرجى وضع دائرة واحدة فقط)

(أ) تعليم ثانوي (ثانوية عامة تؤهل للدخول إلى الجامعة)

(ب) تعليم ثانوي (مهني)

(ج) تعليم ثانوي (أدنى)

د) تعليم إبتدائي

ه) لم يكمل الدراسة الابتدائية

Figure A.18: PISA (p. 2)

س 8. هل لدى والدك أي من المؤهلات التالية؟

(يرجى وضع دائرة واحدة فقط)

(أ) دراسات عليا (على سبيل المثال، الماجستير، الدكتوراه)

(ب) مؤهل جامعي (على سبيل المثال، البكالوريوس)

(ج) دراسات غير جامعية ذات المستوى العالي (على سبيل المثال، دبلوم)

(د) تعليم غير عالي بعد الثانوية

ه) لا مؤهلات

س 9. ماذا يعمل والدك حاليا؟

(يرجى وضع دائرة واحدة فقط)

أ) يعمل بدوام كامل

ب) يعمل بدوام جزئي

ج) لا يعمل ولكن يبحث عن عمل

(د) أخرى (على سبيل المثال، مهام منزلية، متقاعد)

س 10. أي من التالي موجود في منزلك؟

(يرجى وضع دائرة واحدة في كل صف)

أ) مكتب للدراسة	نعم	لا
ب) غرفة خاصة بك	نعم	لا
ج) مكان هادئ للدراسة	نعم	لا
د) جهاز كمبيوتر يمكنك استخدامه للاعمال المدرسة	نعم	لا
ه) برامج كمبيوتر تعليمية	نعم	لا
و) اشتراك في الإنترنت	نعم	لا
ز) كتب أدب كلاسيكي	نعم	لا
ح) كتب شعر	نعم	لا
ط) أعمال فنية (على سبيل المثال، لوحات)	نعم	لا
ي) كتب للمساعدة في المهام الدراسية	نعم	لا
ك) كتب ومراجع تقنية	نعم	لا

Figure A.19: PISA (p. 3)

ل) قاموس	نعم	لا
م) غسالة صحون	نعم	لا
ن) جهاز عرض دي في دي	نعم	لا
س) كمبيوتر محمول خاص بك	نعم	لا
ع) ألعاب إلكترونية (على سبيل المثال، وبي، اكس بوكس)	نعم	لا
ف) آي باد	نعم	لا

س 11. كم من الأشياء التالية يوجد في منزلك؟

(يرجى دائرة واحدة فقط في كل صف)

أ) هاتف خلوي	لا يوجد	واحد	اثنان	ثلاثة	أو أكثر
ب) تلفزيونات	لا يوجد	واحد	اثنان	ثلاثة	أو أكثر
ج) أجهزة كمبيوتر	لا يوجد	واحد	اثنان	ثلاثة	أو أكثر
د) سيارات	لا يوجد	واحد	اثنان	ثلاثة	أو أكثر
ه) غرف مع حمام أو دش	لا يوجد	واحد	اثنان	ثلاثة	أو أكثر

س 12. كم عدد الكتب في منزلك؟

(هناك عادة حوالي 40 كتابا لكل متر من رفوف المكتبة. لا تشمل المجلات والصحف، أو الكتب المدرسية الخاصة بك)

(يرجى وضع دائرة واحدة فقط)

أ) 1 10 كتب

ب) 11 25 كتاب

ج) 26 100 كتاب

د) 101 200 كتاب

ه) 201 500 كتاب

و) أكثر من 500 كتاب

Figure A.20: PISA (p. 4)

تطلعات

لكل شخص أهداف أو طموحات على المدى الطويل. هذه هي الأمور التي يأمل الأفراد تحقيقها. في هذا القسم سوف تجد عددا من أهداف الحياة واحدة تلو الأخرى، ونحن نطرح عليكم سؤال حول كل هدف. والسؤال هو : ما مدى أهمية هذا الهدف بالنسبة لك؟ الرجاء استخدام المقياس التالي في الإجابة على هذا السؤال حول كل هدف حياة. يرجى وضع دائرة حول اختياراتك.

1	2	3	4	5	6	7
Not at All true			Somewhat true			Very true

(7 6 5 صحيح جدا) (4 نوعا ما صحيح) (3 2 1 غير صحيح ابدا)

1. الهدف الاول: أن تكون شخص ثري جدا.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

2. الهدف الثاني: أن أنضج وأتعلم أشياء جديدة.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

3. الهدف الثالث : أن يكون اسمي معروفا من قبل كثير من الناس.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

4. الهدف الرابع: أن يكون لدي أصدقاء جيدين أستطيع الاعتماد عليهم.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

5. الهدف الخامس: اخفاء علامات الشيخوخة بنجاح.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

Figure A.21: Aspirations Index (p. 1)

6. الهدف السادس : العمل من أجل تحسين المجتمع.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

7. الهدف السابع : أن يكون لدي العديد من الممتلكات باهظة الثمن.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

8. الهدف الثامن : أن أكون قادرا أن أنظر إلى حياتي وأجدها ذات معنى وكاملة.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

9. الهدف التاسع : أن أكون محط إعجاب كثير من الناس.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

10. الهدف العاشر : مشاركة حياتي مع شخص أحب.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

11. الهدف الحادي عشر : أن يعلق الناس علي مدى جاذبية مظهري بكثير من الأحيان.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

12. الهدف الثاني عشر: مساعدة الأشخاص الذين يحتاجون إلى مساعدة دون طلب أي شيء في المقابل.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

13. الهدف الثالث عشر: أن أكون ناجح\ناجحة ماديا.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

14. الهدف الرابع عشر: اختيار ما أقوم به، بدلا من أن تدفعني الحياةدفعا.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

Figure A.22: Aspirations Index (p. 2)

15. الهدف الخامس عشر : أن أكون مشهورا\مشهورة .

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

16. الهدف السادس عشر : أن أكون لدي علاقات وطيدة ومتينة.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

17. الهدف السابع عشر : مواكبة الموضة في الشعر والملابس.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

18. الهدف الثامن عشر : العمل على جعل العالم مكانا أفضل.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

19. الهدف التاسع عشر: أن أكون غني\ غنية .

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

20. الهدف العشرون : فهم و تقبل من أنا حقا .

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

21. الهدف الواحد و العشرون: أن يظهر اسمي كثيرا في وسائل الإعلام.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

22. الهدف الثاني و العشرون : أن أشعر بأن هناك أشخاص يحبوني حقا و أحبهم.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

23. الهدف الثالث و العشرون : تحقيق "المظهر" الذي أصبو اليه.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

Figure A.23: Aspirations Index (p. 3)

24. الهدف الرابع و العشرون : مساعدة الآخرين على تحسين حياتهم.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

25. الهدف الخامس و العشرون: ان يكون لدي ما يكفي من المال لشراء كل ما أريد.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

26. الهدف السادس و العشرون: اكتساب قدرة متزايدة على فهم الأسباب التي من أجلها أفعل ما أفعله.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

27. الهدف السابع و العشرون: أن أكون محط إعجاب الكثير من الناس المختلفة.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

28. الهدف الثامن و العشرون: ان أكون لدي علاقات دائمة عميقة.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

29. الهدف التاسع و العشرون: إن تكون صورتي امام الناس جذابة و تروق للآخرين.

ما مدى أهمية هذا بالنسبة لك؟

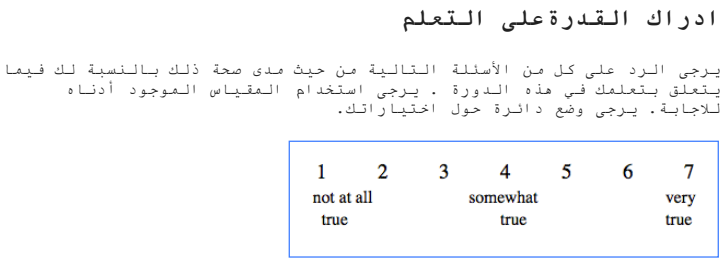
1 2 3 4 5 6 7

30. الهدف الثلاثون : مساعدة الناس المحتاجة.

ما مدى أهمية هذا بالنسبة لك؟

1 2 3 4 5 6 7

Figure A.24: Aspirations Index (p. 4)



ادراك القدرةعلى التعلم

يرجى الرد على كل من الأسئلة التالية من حيث مدى صحة ذلك بالنسبة لك فيما يتعلق بتعلمك في هذه الدورة . يرجى استخدام المقياس الموجود أدناه للاجابة. يرجى وضع دائرة حول اختياراتك.

1	2	3	4	5	6	7
not at all true			somewhat true			very true

(7 6 5 صحيح جدا) (4 نوعا ما صحيح) (3 2 1 غير صحيح ابدا)

1. أنا على ثقة في قدرتي على تعلم هذه المواد.

1 2 3 4 5 6 7

2. أنا قادر/قادرة على تعلم المواد في هذه الدورة .

1 2 3 4 5 6 7

3. أنا قادر/قادرة على تحقيق أهدافي في هذه الدورة .

1 2 3 4 5 6 7

4. أشعر أني قادر/قادرة على مجابهة التحدي المتمثل في تقديم أداء جيد في هذه الدورة .

1 2 3 4 5 6 7

Figure A.25: Perceived Competence Scale

لماذا أفعل ما أفعل

يرجى التفكير مليا ووضع دائرة حول اختيارك

A. لماذا أنجز واجباتي الدراسية؟

1.لأنني أريد المعلم أن يعتقد أنني طالب/طالبة جيد/ة

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

2. لأنني سأكون في ورطة إذا لم أنجز واجباتي

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

3. لأنه ممتع

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

4. لأنني لن أشعر بالرضى عن نفسي إذا لم أؤدي واجباتي الدراسية.

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

5. لأنني أريد أن أفهم المادة.

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

6. لأن هذا ما هو المفترض القيام به

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

7. لأنني أستمتع بأداء واجباتي الدراسية.

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

8. لأنه من المهم بالنسبة لي أن أقوم بواجباتي.

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

B . لماذا أؤدي الأنشطة الصفية؟

9. حتى لا يوبخني المعلم

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

10. لأنني أريد المعلم أن يعتقد أنني طالب\طالبة جيد\جيدة

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

Figure A.26: Self-Regulation Questionnaire - Academic (1)

11.لأنني أريد أن أتعلم أشياء جديدة

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

12. لأنني سوف أخجل من نفسي إذا لم أنهي العمل الصفي

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

13. لأنه ممتع

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

14. لأن هذه هي القاعدة

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

15. لأنني أستمتع بالقيام بالأنشطة الصفية

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

16 .لأنه من المهم بالنسبة لي أن أنجز أعمالي الصفية

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

C. لماذا أحاول الإجابة على الأسئلة الصعبة في الصف؟

17.لأنني أريد أن يعتقد الطلاب الآخرين أنني ذكي

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

18.لأنني أشعر بالخجل من نفسي عندما لا أحاول

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

19.لأنني أستمتع بالإجابة على الأسئلة الصعبة

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

20. لأن هذا ما هو المفترض القيام به

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

21. لمعرفة إذا ما كنت على صواب أو على خطأ

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

22.لأن الإجابة على الأسئلة الصعبة ممتعة بالنسبة لي

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

Figure A.27: Self-Regulation Questionnaire - Academic (2)

23.لأنه من المهم بالنسبة لي محاولة الإجابة على الأسئلة الصعبة في الصف

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

24.لأنني أريد أن يقول المعلم أشياء لطيفة عني

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

D. لماذا أحاول أن أكون جيدا في الصف؟

25.لأن هذا ما هو المفترض القيام به

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

26. حتى يعتقد أساتذتي أنني طالب\طالبة جيد\جيدة

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

27. لأنني أستمتع بأداء أعمالي المدرسية

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

28.لأنني سأكون في ورطة اذا لم يكن أدائي جيدا

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

29.لأنني سأشعر بالضيق من نفسي إذا لم يكن أدائي جيدا

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

30.لأنه من المهم بالنسبة لي محاولة أن يكون أدائي جيدا في الصف

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

31.لأنني سوف أكون فخور\ فخورة بنفسي إذا كان أدائي جيدا

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

32.لأنني قد أحصل على مكافأة إذا قمت بعمل جيد

صحيح جدا نوعا ما صحيح ليس صحيحا جدا ليس صحيحا على الإطلاق

Figure A.28: Self-Regulation Questionnaire - Academic (3)

A.6 Regression assumptions

Before regression analysis was conducted in study 1 and 2, assumptions for this procedure were examined. These assumptions were:

1. Variable type. The criterion variables in both study 1 and study 2 are academic grades scored between 0-100 and as such are continuous.

2. Non-zero variance. All of the predictors in the current study demonstrated non-zero variance.

3. Multi-collinearity. In study 1, analyses to examine the presence of multi-collinearity showed the variance inflation factor (VIF) value was high for three variables, HOMEPOS, PARED and HISEI. Specifically, the VIF for PARED was in excess of 16, the VIF for HISEI was in excess of 577, and the VIF for HOMEPOS was in excess of 13 when the criterion variable was final exam. Similar figures were obtained when the criterion variables were semester grade and coursework. These VIF values are in excess of the ten (or even five) that is recommended as an acceptable upper limit for collinearity. Removal of the HISEI, PARED, and HOMEPOS variables saw the VIF values for all the current study's predictors fall to levels below two for the remaining predictors. In study 2, HOMEPOS, PARED, and HISEI were again removed.

4. Homoscedasticity. Visual inspection of the relevant zpred vs. zresid graphs indicated that no discernable patterns were present. It was therefore assumed that there was no evidence of homoscedasticity.

5. Independence of criterion variables. The current study's criterion variables are not independent. In recognition of this, the current study makes use of separate regression analyses to predict final exam score, semester grade, and coursework score separately.

6. Normally distributed errors. Calculation of the means of the errors in the models indicated that the differences between the observed data and residual values in the model are generally zero or close to zero (Field, 2009, p. 221), which was taken as evidence that the errors in the model were normally distributed.

7. Independent errors Durbin-Watson test results indicated that all values were approximately equal to two. This was taken as evidence that the errors in the models

were independent.

8. Linearity. Visual inspection of the relevant zpred vs. zresid graphs indicated that the assumption of a linear relationship between the study's predictor and criterion variables could be upheld.

9. Skewness and kurtosis According to Brown (1996), a test statistic for skewness or kurtosis of less than -1 or greater than +1 may be an indication that the sample is not normally distributed.

In addition, if the kurtosis or skewness statistic is a value greater than two-times the standard error for kurtosis or skewness, this is an indication that the population distribution is non-normal.

Table A.4: Study 1: skew and kurtosis for criterion variables

	Coursework	Final exam	Semester grade
N	166	166	166
Missing	0	0	0
Mean	78.6446	55.2711	66.3373
Std. Deviation	11.56013	13.33276	10.40720
Skewness	-1.164	-0.312	-0.618
Std. Error of Skewness	0.188	0.188	0.188
Kurtosis	2.828	-0.118	0.910
Std. Error of Kurtosis	0.375	0.375	0.375

Table A.5: Study 1: skew and kurtosis for psychological and SES variables

1	AU	CO	MA	PC	SE	SS
N	166	166	166	166	162	166
Missing	0	0	0	0	4	0
Mean	3.2190	3.1097	-0.8282	6.0683	74.7312	2.0099
Std. Deviation	0.46593	0.38483	0.86509	0.87098	18.90743	0.25400
Skewness	-0.511	-0.222	-0.305	-0.762	-1.532	-0.652
Std. Error of Skewness	0.188	0.188	0.188	0.188	0.191	0.188
Kurtosis	-0.437	-0.296	0.190	-0.262	0.983	0.157
Std. Error of Kurtosis	0.375	0.375	0.375	0.375	0.379	0.375

Table A.6: Study 2: skew and kurtosis for criterion variables

	Coursework	Mid-term exams	Final exams	Semester grades
N	80	80	80	80
Missing	0	0	0	0
Mean	78.7656	76.4967	67.7943	74.3522
Std. Deviation	7.28753	8.97712	9.01491	7.54066
Skewness	-0.323	-0.315	0.458	-0.071
Std. Error of Skewness	0.269	0.269	0.269	0.269
Kurtosis	-0.185	-0.153	-0.067	-0.171
Std. Error of Kurtosis	0.532	0.532	0.532	0.532

Table A.7: Study 2: skew and kurtosis for Time 1 psychological and SES variables

1	AU(T1)	CO(T1)	PC(T1)	MA(T1)	SS	SE
N	80	80	80	80	80	76
Missing	0	0	0	0	0	4
Mean	3.2501	3.0543	5.9750	-0.4396	2.3245	76.4488
Std. Deviation	0.54104	0.43970	0.92743	0.89394	0.28684	18.52696
Skewness	-0.720	-0.166	-0.616	-0.920	-0.379	-0.809
Std. Error of Skewness	0.269	0.269	0.269	0.269	0.269	0.276
Kurtosis	-0.195	-0.891	-0.531	0.677	-0.902	-0.201
Std. Error of Kurtosis	0.532	0.532	0.532	0.532	0.532	0.545

Table A.8: Study 2: skew and kurtosis for Time 2 psychological variables

	AU(T2)	CO(T2)	PC(T2)	MA(T2)
N	80	80	80	80
Missing	0	0	0	0
Mean	3.1542	2.9047	6.0125	-0.5812
Std. Deviation	0.54317	0.47386	1.07319	0.97975
Skewness	-0.531	-0.993	-1.436	-0.643
Std. Error of Skewness	0.269	0.269	0.269	0.269
Kurtosis	0.121	1.994	2.875	0.037
Std. Error of Kurtosis	0.532	0.532	0.532	0.532

Table A.9: Study 2: skew and kurtosis for T2-T1 psychological variables

	AU (T2-T1)	CO (T2-T1)	PC (T2-T1)	MA (T2-T1)
N	80	80	80	80
Missing	0	0	0	0
Mean	-0.0960	-0.1634	0.0375	-0.1417
Std. Deviation	0.40612	0.35302	0.94643	0.83063
Skewness	-2.084	-0.883	-1.829	0.879
Std. Error of Skewness	0.269	0.269	0.269	0.269
Kurtosis	11.379	2.117	9.329	4.760
Std. Error of Kurtosis	0.532	0.532	0.532	0.532

10. Outliers. Following Field (2009), a z-score value in excess of +3.29/-3.29 was used as a criterion for identifying the presence of univariate outliers. The outliers identified in the studies are now described below, beginning with study 1.

A.6.1 Normalizing the distribution of the coursework scores in study 1

Following Templeton (2011), the *rank* feature in SPSS was used to rank the coursework scores according to fractional rank. Using the *compute variable* feature, the fuction group *Inverse DF* and special function group *Idf.Normal* were used to generate the new, normally-distributed coursework variable.

As can be seen from Table A.4 and Figure A.29, prior to the transformation, the distribution of coursework in study 1 showed skew and kurtosis.

After the procedure outlined above, the distribution of coursework scores in study 1 was normalized, as shown in Figure A.30 and Table A.10.

Results from regression analyses using the transformed coursework variable in study 1 are now given below, beginning with Model 1.

As can be seen from Table A.10, the statistically significant predictors in the regression model remained gender and SES (Scaled) in model 1, which is consistent with results shown in Table 5.4.

Similarly, in model 2 (see Table A.11), controlled motivation and materialism

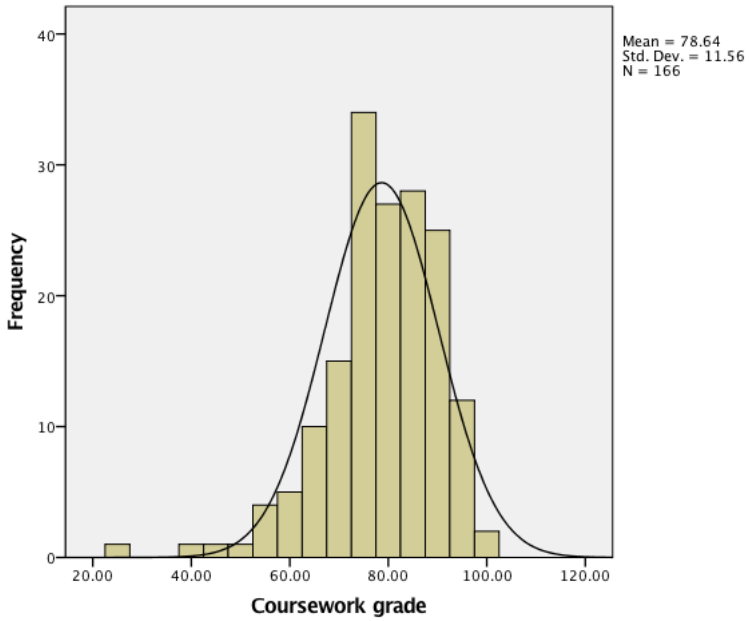


Figure A.29: Non-transformed coursework scores distribution in study 1

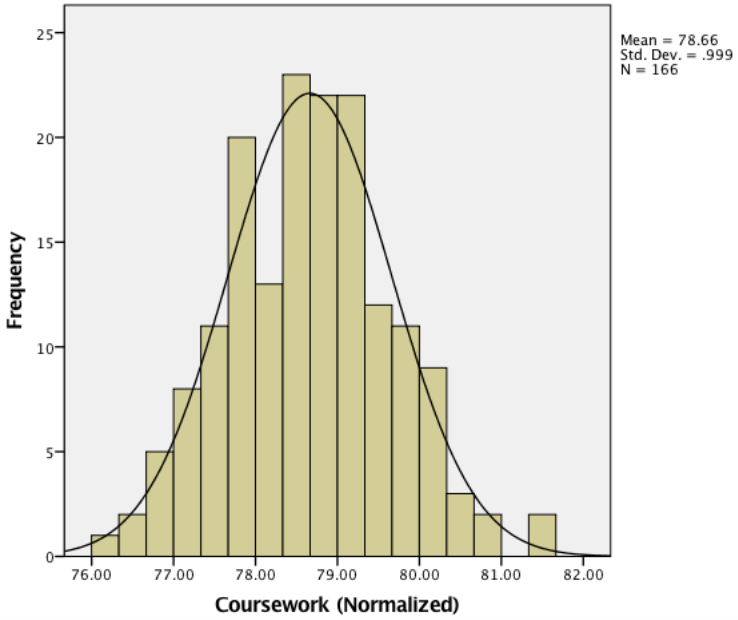


Figure A.30: Transformed coursework scores distribution in study 1

Table A.10: Study 1: Model 1 using normalized coursework scores

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	77.016	2.473		31.138	0.000
GN	-1.047	0.207	-0.477	-5.051	0.000
SS	-1.256	0.397	-0.304	-3.159	0.002
SE	-0.002	0.006	-0.038	-0.360	0.720
IE	0.057	0.328	0.017	0.175	0.862
GE	0.030	0.019	0.169	1.587	0.117
GA	0.009	0.020	0.047	0.469	0.640
AU	-0.402	0.244	-0.176	-1.647	0.103
CO	0.457	0.286	0.162	1.598	0.114
MA	-0.135	0.143	-0.095	-0.940	0.350
PC	0.073	0.130	0.056	0.557	0.579
FC	0.078	0.321	0.024	0.243	0.809

were the only statistically significant predictors, which is consistent with results shown in Table 5.5.

Table A.11: Study 1: Model 2 using normalized coursework scores

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	77.801	0.792		98.265	0.000
AU	-0.267	0.190	-0.125	-1.407	0.161
CO	0.486	0.215	0.187	2.265	0.025
MA	-0.254	0.094	-0.220	-2.696	0.008
PC	0.000	0.094	0.000	-0.002	0.999

Finally, Table A.9 shows the results from Model 3. Once again only gender and SES (SS) were statistically significant predictors, which is consistent with results shown in Table 5.6.

A.6.2 Study 1 outliers

In study 1, Case 148 and Case 152's data for semester grades and coursework was removed, as was Case 69's for coursework alone, Case 25 and Case 113's data for IELTS, and Case 11 for GPA (English). In each case, the z-scores exceeded +/- 3.29. Investigation of cases 148, 152, and 69 indicated that the participants had missed a number of important quizzes for coursework, which directly impacted the

Table A.12: Study 1: Model 2 using normalized coursework scores

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	77.620	1.961		39.588	0.000
AU	-0.396	0.227	-0.178	-1.746	0.084
CO	0.483	0.267	0.175	1.809	0.074
MA	-0.148	0.127	-0.110	-1.172	0.244
GN	-1.034	0.191	-0.474	-5.413	0.000
GE	0.028	0.017	0.161	1.690	0.095
GA	0.012	0.019	0.059	0.618	0.538
SS	-1.288	0.356	-0.320	-3.619	0.000

coursework score (and, indirectly, semester grade). With the deletion of these cases, the number of participants included in any given listwise correlational analysis fell to a minimum of 88. In order to run the imputation procedure, the data for from all six cases (11, 25, 69, 113, 148, and 152) across all variables was extracted.

A.6.3 Study 2 outliers

In study 2, Case 32's data for GPA (English) was removed, as was Case 17's data for GPA (All), Case 45's for perceived competence (at T2), Case 22 and 38's for controlled motives (at T2), and Case 60's for materialism at T1. In each case, the z-scores exceeded +/- 3.29. Change variables that were impacted were also extracted.

With the deletion of these cases, the number of participants in any given listwise correlational analysis fell to a minimum of 15. This was considered insufficient. Rather than forgoing listwise comparisons, a semi-listwise comparison was used instead. This meant the variables with the most missing data were removed. These variables were (in the case of Group 1): IELTS score with 51 missing, and HSGPA (All subjects) with 39 missing. This procedure raised the number of participants in any given listwise correlational analysis to a minimum of 64.

Appendix B

Results

B.1 Correlational results across sets

B.1.1 Eight sets of assumptions

Eight sets were created in SPSS under the assumptions shown in Table B.1. Correlational results for study 1 and study 2 are now presented, beginning with study 1. The correlations that are focused upon are those that show a co-efficient greater than 0.1 in at least four of the eight sets and/or a mean correlation value greater than 0.1.

Table B.1: Sets of assumptions for separate analyses

Data Set	Imputed or non-imputed	Outliers	Deletion
1.	Non-imputed	With	Pairwise
2.	Non-imputed	With	Listwise
3.	Non-imputed	Without	Pairwise
4.	Non-imputed	Without	Listwise
5.	Imputed	With	Pairwise
6.	Imputed	With	Listwise
7.	Imputed	Without	Pairwise
8.	Imputed	Without	Listwise

B.1.2 Study 1

Correlational analysis results are presented as eight statistics. The correlations that are focused upon are those that show a co-efficient greater than 0.1 in at least four

of the eight data sets and/or a mean correlation value greater than 0.1.

Gender

As Table B.2 shows, gender correlated positively with materialism (M = 0.234) and first and continuing generation students (M = 0.205) across all sets. In contrast, gender correlated negatively with SES (Scaled), coursework, and semester grades across all sets. The size of the mean correlation with coursework was small (M = -0.410). The correlations between gender and SES (SE), IELTS score, GPA (All), autonomous motives, controlled motives, perceived competence, and final exams were marginal (as defined above) and hence not show.

Table B.2: Study 1. Gender: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	M	SD	Modal(s)
GN & SS	-0.22**	-0.13	-0.22**	-0.14	-0.22**	-0.20**	-0.23**	-0.22**	-0.198	0.04	-0.22
GN & MA	0.25**	0.18	0.25**	0.18	0.25**	0.26**	0.25**	0.25**	0.234	0.03	0.25
GN & CW	-0.39**	-0.47**	-0.38**	-0.50**	-0.39**	-0.40**	-0.37**	-0.38**	-0.41	0.05	-
GN & SG	-0.19*	-0.29**	-0.13	-0.22*	-0.19*	-0.20*	-0.13	-0.14	-0.186	0.05	-
GN & FC	0.21**	0.2	0.21**	0.2	0.21**	0.20*	0.21**	0.20*	0.205	0.01	0.21

*$p < 0.05$; **$p < 0.01$

SES(Scaled)

As Table B.3 shows, SES (Scaled) correlated positively with SES (SE), and perceived competence across all sets. The size of the correlation between SES (Scaled) and SES (SW) was small (M = 0.336). SES (Scaled) was negatively correlated with coursework, final exam and semester grades all sets. The size of the correlation between SES (Scaled) and semester grades was small but identical in five of the eight sets (M = -0.253. In addition, the correlations between SES (Scaled) and the study's three criterion variables (coursework, final exams, and semester grades) were statistically significant in most of the sets. Furthermore, the correlations between SES (Scaled) and perceived competence were statistically significantly in six of the eight sets. The correlations between SES (Scaled) and IELTS score, GPA (English), GPA (All), autonomous motives, controlled motives, and first and continuing generation students were marginal and hence not shown.

Table B.3: Study 1. SES (Scaled): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	M	SD	Modal(s)
SS & SE	0.34**	0.32**	0.34**	0.31**	0.34**	0.34**	0.35**	0.35**	0.336	0.01	0.34
SS & PC	0.22**	0.11	0.22**	0.13	0.22**	0.19*	0.22**	0.20*	0.188	0.04	0.22
SS & CW	-0.18*	-0.22*	-0.18*	-0.21*	-0.18*	-0.18*	-0.19*	-0.19*	0.191	0.02	-0.18
SS & FE	-0.19*	-0.17	-0.19*	-0.18	-0.19*	-0.18*	-0.21**	-0.19*	0.188	0.01	-0.19
SS & SG	-0.25**	-0.25*	-0.25**	-0.27*	-0.25**	-0.24**	-0.27**	-0.25**	0.253	0.01	-0.25

*$p < 0.05$; **$p < 0.01$

SES(Standardized and weighted)

As Table B.4 shows, SES (SE) correlated positively with IELTS scores, GPA (English), and First and continuing generation students. The size of the mean correlation between SES (SE) and GPA (English) was small (M = 0.333). Unlike SES (scaled), SES (SE) was only marginally correlated with coursework, final exams, and semester grades. Furthermore, unlike SES (Scaled), which was positively correlated with perceived competence, the direction of the correlation between SES (SE) and perceived competence was negative and marginal. The correlations between GPA (All), and autonomous motives, controlled motives, and materialism were also marginal and hence are not shown.

Table B.4: Study 1. SES (SE): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	M	SD	Modal(s)
SE and IE	0.17*	0.28**	0.18*	0.28**	0.16*	0.16*	0.20*	0.20*	0.204	0.05	0.16 / 0.20
SE and GE	0.30**	0.33**	0.34**	0.41**	0.30**	0.30**	0.34**	0.34**	0.333	0.04	0.30 / 0.34
SE and FC	0.28**	0.39**	0.28**	0.38**	0.28**	0.28**	0.29**	0.29**	0.309	0.05	0.28

*$p < 0.05$; **$p < 0.01$

IELTS

As Table B.5 shows, IELTS score correlated positively with GPA (English), GPA (All), final exam, and semester grades. The sizes of the correlations between IELTS score and final exam were small (M = 0.263). The correlations between IELTS score and autonomous motives, controlled motives, materialism, perceived competence, and first and continuing generation students were marginal and hence not shown.

Table B.5: Study 1. IELTS: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	M	SD	Modal(s)
IE & GE	0.27**	0.28**	0.28**	0.29**	0.17	0.18	0.19*	0.20*	0.233	0.05	0.28
IE & GA	0.09	0.18	0.07	0.2	0.09	0.1	0.1	0.1	0.116	0.05	0.1
IE & FE	0.27**	0.31**	0.25**	0.25*	0.26**	0.27**	0.24**	0.25**	0.263	0.02	0.25
IE & SG	0.22**	0.25*	0.23**	0.27*	0.21**	0.22**	0.23**	0.24**	0.234	0.02	0.22 / 0.23

*$p < 0.05$; **$p < 0.01$

GPA(English)

As Table B.6 shows, GPA (English) correlated positively with GPA (All), coursework, final exam, semester grades, and First and continuing generation students. The size of the mean correlation between GPA (English) and GPA (All) was small (M = 0.403). The size of the correlations between GPA (All) and coursework were marginal in four of the eight sets (and three out of four of the imputed sets). The correlations between autonomous motives, controlled motives, materialism, and perceived competence were marginal and hence not shown.

Table B.6: Study 1. GPA(English): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	M	SD	Modal(s)
GE & GA	0.43**	0.43**	0.38**	0.39**	0.41**	0.42**	0.38**	0.38**	0.403	0.02	0.38
GE & CW	0.17	0.21*	0.09	0.14	0.07	0.07	0.14	0.07	0.11	0.06	0.07
GE & FE	0.21*	0.17	0.21*	0.08	0.22*	0.22*	0.15	0.16	0.178	0.05	0.21/0.22
GE & SG	0.27**	0.26*	0.18	0.17	0.22*	0.23*	0.17	0.18	0.21	0.04	0.17/0.18
GE & FC	0.09	0.14	0.11	0.19	0.09	0.11	0.12	0.14	0.124	0.03	0.09/0.11/0.14

*$p < 0.05$; **$p < 0.01$

GPA(All)

As Table B.7 shows, GPA (All) correlated positively with perceived competence, final exam, and semester grades. In contrast, GPA (All) and materialism correlated negatively (M = -0.21). The size of the mean correlation between GPA (All) and semester grades was small (M = 0.256) and comparable with the correlations between IELTS score and semester grade (M = 0.234) and GPA (English) and semester grades (M = 0.210). The correlations between GPA (All) and autonomous motives, controlled motives, coursework, and first and continuing generation students were marginal and hence not shown.

Table B.7: Study 1. GPA(All): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	M	SD	Modal(s)
GA & MA	-0.19*	-0.17	-0.19*	-0.17	-0.21**	-0.21**	-0.21*	-0.21*	-0.195	0.02	-0.21
GA & PC	0.12	0.18	0.12	0.19	0.12	0.12	0.13	0.14	0.14	0.03	0.12
GA & FE	0.24**	0.13	0.24**	0.1	0.22*	0.22*	0.22	0.22	0.199	0.05	0.22
GA & SG	0.29**	0.21*	0.31**	0.18	0.26**	0.26**	0.27*	0.27*	0.256	0.04	0.26 / 0.27

*$p < 0.05$; **$p < 0.01$

Autonomous motives

As expected and as Table B.8 shows, autonomous motives correlated positively with controlled motives and perceived competence. The sizes of the mean correlations were, in both cases, small. In both cases, correlations were statistically significant across all eight sets. As expected, autonomous motives and materialism were negatively correlated. Again, the size of the mean correlation was small (M = -0.289); and again, the correlations were statistically significant across all eight data sets. The correlations between autonomous motives and coursework, final exams, semester grades, and first or continuing generation students were marginal and hence not shown.

Table B.8: Study 1. Autonomous motives: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	M	SD	Modal(s)
AU & CO	0.36**	0.46**	0.36**	0.45**	0.36**	0.36**	0.36**	0.37**	0.385	0.04	0.36
AU & MA	-0.28**	-0.31**	-0.28**	-0.32**	-0.28**	-0.28**	-0.28**	-0.28**	0.289	0.02	-0.28
AU & PC	0.34**	0.27**	0.34**	0.29**	0.34**	0.32**	0.35**	0.33**	0.323	0.03	0.34

*$p < 0.05$; **$p < 0.01$

Controlled motives

As Table B.9 shows, controlled motives correlated positively with perceived competence and coursework. Although the mean correlation between controlled motives and perceived competence was positive (M = 0.121), it was considerably smaller than the mean correlation between autonomous motives and perceived competence (M = 0.323). Although controlled motives correlated positively with coursework, the correlation size was marginal to small (M = 0.121) and not consistently statistically significant across data sets. The correlations between controlled motives and final exam, semester grades, and first or continuing generation student were marginal and hence not shown.

Table B.9: Study 1. Controlled motives: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	M	SD	Modal(s)
CO & PC	0.15	0.04	0.15	0.05	0.15	0.15	0.14	0.14	0.121	0.047	0.15
CO & CW	0.14	0.07	0.18*	0.13	0.14	0.14	0.17*	0.17*	0.143	0.035	0.14

*$p < 0.05$; **$p < 0.01$

Materialism

As Table B.10 shows, materialism correlated negatively with perceived competence and coursework. In all of the sets, the size of the correlations with perceived competence were small and statistically significant, as expected. The size of the mean correlation with coursework was small to marginal (M = 0.151). The correlations between materialism and final exams, semester grades, and first or continuing students were marginal and hence do not appear.

Table B.10: Study 1. Materialism: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	M	SD	Modal(s)
MA & PC	-0.24**	-0.37**	-0.24**	-0.38**	-0.24**	-0.25**	-0.23**	-0.24**	-0.27	0.06	-0.24
MA & CW	-0.15	-0.09	-0.18*	-0.13	-0.15	-0.16*	-0.17*	-0.18*	-0.15	0.03	-0.15/-0.18

*$p < 0.05$; **$p < 0.01$

Perceived competence

The correlations between perceived competence and coursework, semester grades, final exams, and first or continuing students were marginal and hence not included.

First and continuing generation

All non-marginal correlations have been shown in the tables above.

Exams

As Tables B.11 and B.12 show, coursework, final exam, and semester grades were all positively and statistically significantly correlated. The size of the mean correlation between coursework and final exam was small (M = 0.278).

As expected, the size of the mean correlation between final exam and semester grade was large (M = 0.846). The correlations between the study's criterion variables and first or continuing generation students were marginal and hence not reported.

Table B.11: Study 1. Coursework: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	M	SD	Modal(s)
CW & FE	0.32**	0.37**	0.23**	0.19	0.32**	0.32**	0.23**	0.24**	0.278	0.06	0.23 / 0.32
CW & SG	0.68**	0.76**	0.60**	0.64**	0.68**	0.69**	0.60**	0.61**	0.658	0.06	0.60 / 0.68

*$p < 0.05$; **$p < 0.01$

Table B.12: Study 1. Final exam: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	M	SD	Modal(s)
FE & SG	0.86**	0.83**	0.85**	0.80**	0.86**	0.86**	0.86**	0.85**	0.846	0.02	0.86

*$p < 0.05$; **$p < 0.01$

B.1.3 Study 2

Again, correlational analysis results were extracted from eight sets (created as shown in Table B.1 above). Once again, the correlations that are focused upon are those that show a co-efficient greater than 0.1 in at least four of the eight sets and/or a mean correlation value greater than 0.1.

The correlation results are divided into five divisions. The first division shows Time 1 predictors and Time 1 criterion variables, where the criterion variables were mid-term exam (with and without Reading). The second division shows Time 2 predictors with Time 2 criterion variables (again, with and without Reading). The third division shows Time 1 predictors with Time 2 criterions (with and without Reading). The fourth division shows Time 1 and Time 2 predictors only. Once again, the correlations that are focused upon are those that show a co-efficient greater than 0.1 in at least 50% of the data sets and/or a mean correlation value greater than 0.1. The fifth division shows the change predictor variables and the study's criterion variables.

Correlational results for Division 1: correlations for Time 1 predictors and Time 1 criterion variables only

Results showing the correlations between Time 1 predictors and Time 1 criterion variables across the eight sets are now presented for each of the variables in the correlational analyses, subject to the size of the correlations for that variable meeting the condition mentioned above. Because of the large number of students who did not provide data concerning their IELTS score or GPA (All) score, this meant that

the number of participants in the Listwise procedures drop to just above 20 in some cases. To avoid such low numbers, a semi-Listwise procedure was adopted, where IELTS scores and GPA (All) were extracted before the correlational analyses were run. As a result of this approach, no correlations are given in Division 1 for Sets 2, 4, 6 and 8 when IELTS score and GPA (All) were part of the correlational analyses.

Gender As Table B.13 shows, gender correlated positively with IELTS score. However, the mean correlation was marginal (M = 0.098). In contrast, gender correlated negatively with GPA (All), GPA (English), SES (SE), SES (Scaled), perceived competence (Time 1), autonomous motives (Time 1), and controlled motives (Time 1). The size of mean correlation between gender and SES (SW) approached medium (M = -0.379) and was statistically significant across all eight sets. The size of the mean correlation between gender and controlled motives (Time 1) was small (M = -0.293) and was statistically significant in all eight sets. The correlations between gender and mid-term results and gender mid-term results minus Reading were marginal and hence not shown.

Table B.13: Study 2, Time 1. Gender: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
GN & IE	0.15	-	0.15	-	0.03	-	0.06	-	0.098	0.06	0.15
GN & GA	-0.09	-	-0.26	-	-0.06	-	-0.09	-	-0.125	0.09	-0.09
GN & GE	-0.26*	-0.29*	-0.2	-0.23	-0.22	-0.24*	-0.17	-0.19	-0.225	0.04	-
GN & SE	-0.38**	-0.41**	-0.38**	-0.40**	-0.38**	-0.38**	-0.35**	-0.35**	-0.379	0.02	-0.38
GN & SS	-0.26*	-0.24*	-0.26*	-0.22	-0.26*	-0.28*	-0.22	-0.23	-0.246	0.02	-0.26
GN & PC1	-0.15	-0.11	-0.15	-0.13	-0.15	-0.13	-0.17	-0.15	-0.143	0.02	-0.15
GN & CO1	-0.30**	-0.29*	-0.30**	-0.27*	-0.30**	-0.30**	-0.29**	-0.29*	-0.293	0.01	-0.3
GN & AU1	-0.18	-0.16	-0.18	-0.14	-0.18	-0.18	-0.19	-0.19	-0.175	0.02	-0.18

*$p < 0.05$; **$p < 0.01$

IELTS score A significant number of students (51 out of 80) did not provide their IELTS score. This may account for some of the variation in the correlational results obtained from the non-imputed and imputed data sets. As can been seen from Table B.14, IELTS score and GPA (All) were positively correlated (M = 0.285). In contrast, IELTS score and one of the socio-economic variables, SES (SE), were negatively correlated (M = -0.258). Although IELTS score was positively correlated with one of the two Mid-term criterion variables – Mid-term (minus Reading) – the mean correlation value was just 0.123. Correlations between IELTS score and GPA

(English), controlled motives (Time 1), autonomous motives (Time 1), materialism (Time 1) and mid-term exams were marginal and hence are not shown.

Table B.14: Study 2, Time 1. IELTS: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
IE & GA	0.47	-	0.47	-	0.04	-	0.16	-	0.285	0.21	0.47
IE & SE	-0.35	-	-0.35	-	-0.1	-	-0.23	-	-0.258	0.12	-0.35
IE & PC1	0.23	-	0.23	-	0.08	-	0.12	-	0.165	0.08	0.23
IE & Mid-R	0.16	-	0.16	-	0.06	-	0.11	-	0.123	0.05	0.16

*$p < 0.05$; **$p < 0.01$

GPA (All) Because of the number of students who did not provide a score, GPA (All) was removed from final analysis. Nevertheless, as Table B.15 shows, GPA (All) was positively correlated with a number of variables, including controlled motives (Time 1), autonomous motives (Time 1) and mid-term exams (both with and without Reading). The size of the correlation between GPA (All) and mid-term reading approached medium in one set, however the mean correlation value was small (M = 0.245). The correlations between GPA (All) and SES (SE), SES (Scaled), and materialism (Time 1) were marginal and hence are not shown.

Table B.15: Study 2, Time 1. GPA(All): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
GA & GE	0.2	-	0.29	-	0.17	-	0.27	-	0.2325	0.06	-
GA & PC1	0.15	-	0.17	-	0.07	-	0.13	-	0.13	0.04	0.13
GA & CO1	0.29	-	0.21	-	0.19	-	0.08	-	0.193	0.09	-
GA & AU1	0.35*	-	0.2	-	0.24*	-	0.13	-	0.23	0.09	-
GA & Mid	0.35*	-	0.17	-	0.25*	-	0.21	-	0.245	0.08	-
GA & Mid-R	0.37*	-	0.17	-	0.26*	-	0.2	-	0.25	0.09	-

*$p < 0.05$; **$p < 0.01$

GPA (English) As Table B.16 shows, correlational analyses revealed that GPA (English) was only marginally correlated with one psychological variable, materialism at Time 1 (M = 0.173). The correlations between GPA (English) and SES (SE), perceived competence (Time 1), controlled motives (Time 1), autonomous motives (Time 1), mid-term exams, and mid-term exams (minus Reading) were marginal and hence do not appear.

SES (SE) As Table B.17 shows, SES (SE) and SES (Scaled) were positively correlated. The size of the correlation between SES (SE) and SES (Scaled) was medium

Table B.16: Study 2, Time 1. GPA(English): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
GE & SS	0.12	0.12	0.09	0.08	0.12	0.12	0.09	0.09	0.104	0.02	0.12
GE & MA1	0.19	0.19	0.21	0.22	0.16	0.16	0.12	0.13	0.173	0.04	0.16, 0.19

*$p < 0.05$; **$p < 0.01$

(M = 0.469). SES (SE) and controlled motives were also positively correlated. However, the correlation was marginal (M = 0.1). The size of the correlation between SES (SW) and perceived competence (Time 1) was small and (unexpectedly) negative (M = -0.143). The correlations between SES (SE) and autonomous motives, materialism, and Mid-term exams (with and without Reading) were marginal and hence not shown.

Table B.17: Study 2, Time 1. SES(SE): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
SE & SS	0.45**	0.53**	0.45**	0.52**	0.45**	0.45**	0.45**	0.45**	0.469	0.03	0.45
SE & PC1	-0.15	-0.05	-0.15	-0.13	-0.15	-0.15	-0.18	-0.18	-0.143	0.04	-0.15
SE & CO1	0.12	0.12	0.12	0.1	0.11	0.11	0.06	0.06	0.1	0.03	0.12

*$p < 0.05$; **$p < 0.01$

SES (Scaled) As Table B.18 shows, SES (Scaled) was negatively correlated with mid-term exams (with and without Reading). The sizes of the mean correlations were small.

Table B.18: Study 2, Time 1. SES(Scaled): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
SS & Mid	-0.18	-0.23	-0.18	-0.21	-0.18	-0.17	-0.13	-0.13	-0.176	0.04	-0.18
SS & Mid-R	-0.23*	-0.27*	-0.23*	-0.25*	-0.23*	-0.22	-0.19	-0.18	-0.225	0.03	-0.23

*$p < 0.05$; **$p < 0.01$

Perceived competence (Time 1) As shown in Table B.19, perceived competence was positively correlated with all the psychological variables except, as expected, materialism. Across all sets, results indicated that there was a small but consistent correlation between perceived competence and mid-term exams – with Reading (M = 0.231) and without (M = 0.215).

Controlled motives (Time 1) As shown in Table B.20, Controlled motives (Time 1) correlated positively with autonomous motives (Time 1) and materialism

Table B.19: Study 2, Time 1. Perceived competence: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
PC1 & CO1	0.12	0.13	0.12	0.14	0.11	0.09	0.15	0.12	0.123	0.02	0.12
PC1 & AU1	0.18	0.17	0.18	0.16	0.18	0.17	0.17	0.15	0.17	0.01	0.17, 0.18
PC1 & MA1	-0.19	-0.17	-0.16	-0.12	-0.19	-0.2	-0.16	-0.17	-0.17	0.03	-0.17
PC1 & Mid	0.23*	0.25*	0.23*	0.23	0.23*	0.23*	0.22	0.23	0.231	0.01	0.23
PC1 & Mid-R	0.21	0.23	0.21	0.23	0.21	0.21	0.21	0.21	0.215	0.01	0.21

*$p < 0.05$; **$p < 0.01$

(Time 1). The sizes of the correlations between controlled motives and autonomous at Time 1 across all eight sets were medium (M = 0.511). Results also indicated there was a small but positive correlation between controlled motives and materialism (M = 0.144). The correlations between controlled motives and mid-term exams (with and without Reading) were marginal and hence are not shown.

Table B.20: Study 2, Time 1. Controlled motives: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
CO1 & AU1	0.52**	0.48**	0.52**	0.47**	0.52**	0.52**	0.53**	0.53**	0.511	0.02	0.52
CO1 & MA1	0.12	0.09	0.15	0.12	0.11	0.1	0.23*	0.23*	0.144	0.06	0.12, 0.23

*$p < 0.05$; **$p < 0.01$

Autonomous motives (Time 1) As shown in Table B.21, Autonomous motives (Time 1) were negatively correlated with mid-term exams (M = -0.141) and mid-term exams (minus Reading) (M = -0.141). In both cases, however, the sizes of the correlations were marginal to small. Unlike controlled motives at Time 1 (See above), results across all sets indicated there was a small, negative correlation with materialism (M = -0.099).

Table B.21: Study 2, Time 1. Autonomous motives: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
AU1 & MA1	-0.11	-0.14	-0.05	-0.08	-0.11	-0.12	-0.08	-0.1	-0.099	0.03	-0.08, -0.11
AU1 & Mid	-0.08	-0.09	-0.08	-0.08	-0.08	-0.12	-0.14	-0.19	-0.108	0.04	-0.08
AU1 & Mid-R	-0.12	-0.11	-0.12	-0.1	-0.12	-0.16	-0.18	-0.22	-0.141	0.04	-0.12

*$p < 0.05$; **$p < 0.01$

Materialism (Time 1) The correlations between materialism (Time 1) and mid-term exams (with and without Reading) were marginal and hence not shown.

Mid-term exams As shown in Table B.22, mid-term exam minus Reading correlated positively with mid-term exam with Reading. The size of the correlation between these two criterion variables was large (M = 0.966).

Table B.22: Study 2, Time 1. Mid-term exams (with and without Reading): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
Mid & Mid-R	0.97**	0.96**	0.97**	0.97**	0.97**	0.97**	0.96**	0.96**	0.966	0.01	0.97

*$p < 0.05$; **$p < 0.01$

Division 2: correlations for Time 2 predictors and Time 2 criterion variables

Results showing the correlations between Time 2 predictors and Time 2 criterion variables are now given in the tables below. These results begin with the correlations between Gender and study 2's (Time 2) predictors and criterion variables.

Gender As shown in Table B.23, gender correlated negatively with controlled motives (Time 2), autonomous orientations (Time 2), final exams, semester grades, final exams (minus Reading), semester grades (minus Reading), and continuing or first generation students. In all cases, the size of the mean correlation was small.

Table B.23: Study 2, Time 2. Gender: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
GN & CO2	-0.19	-0.18	-0.19	-0.14	-0.19	-0.18	-0.18	-0.16	-0.176	0.02	-0.18, -0.19
GN & AU2	-0.13	-0.11	-0.13	-0.1	-0.13	-0.11	-0.14	-0.11	-0.12	0.01	-0.11, -0.13
GN & FE	-0.12	-0.18	-0.12	-0.25*	-0.12	-0.14	-0.19	-0.21	-0.166	0.05	-0.12
GN & SG	-0.05	-0.1	-0.05	-0.15	-0.05	-0.07	-0.13	-0.15	-0.094	0.04	-0.05
GN & FE-R	-0.16	-0.22	-0.16	-0.30*	-0.16	-0.19	-0.24*	-0.27*	-0.213	0.05	-0.16
GN & SG-R	-0.05	-0.1	-0.05	-0.17	-0.05	-0.08	-0.14	-0.16	-0.1	0.05	-0.05
GN & FC	-0.18	-0.22	-0.18	-0.2	-0.18	-0.19	-0.18	-0.18	-0.189	0.02	-0.18

*$p < 0.05$; **$p < 0.01$

IELTS score As shown in Table B.24, the correlations between IELTS score and perceived competence (Time 2), coursework, and Semester grades (minus Reading) were positive. The mean correlations were small, with mean correlation values not exceeding 0.11. In contrast, the correlations between IELTS score and materialism (Time 2) and continuing or first generation students were negative. In both cases,

the sizes of the mean correlations were small. The correlations between IELTS score and autonomous motives (Time 2), controlled motives (Time 2), coursework, semester grades, and final exams (minus Reading) were marginal and hence do not appear.

Table B.24: Study 2, Time 2. IELTS: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
IE & PC2	0.2	-	0.01	-	0.04	-	0.1	-	0.088	0.08	-
IE & MA2	-0.26	-	-0.26	-	-0.05	-	-0.05	-	-0.155	0.12	-0.05, -0.26
IE & CW	0.12	-	0.12	-	0.1	-	0.06	-	0.1	0.03	0.12
IE & SG-R	0.12	-	0.12	-	0.09	-	0.09	-	0.105	0.02	0.12
IE & FC	-0.18	-	-0.18	-	0	-	-0.05	-	-0.103	0.09	-0.18

*$p < 0.05$; **$p < 0.01$

GPA (All) As shown in Table B.25, GPA (All) was positively correlated with controlled orientations (Time 2), autonomous motives (Time 2), final exams, semester grades (with and without Reading), semester grades (with and without Reading) and first or continuing generation students. In each case the mean correlation values were small. GPA (All) was negatively correlated with materialism (Time 2). The mean correlation was small (M = -0.188).

Table B.25: Study 2, Time 2. GPA (All): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal value(s)
GA & CO2	0.22	-	-0.11	-	0.16	-	-0.14	-	0.033	0.18	-
GA & AU2	0.23	-	0.12	-	0.18	-	0.02	-	0.138	0.09	-
GA & MA2	-0.31*	-	-0.17	-	-0.21	-	-0.06	-	-0.188	0.1	-
GA & CW	0.34*	-	0.09	-	0.22	-	0.12	-	0.193	0.11	-
GA & FE	0.21	-	0.07	-	0.11	-	0.16	-	0.138	0.06	-
GA & SG	0.34*	-	0.13	-	0.21	-	0.19	-	0.218	0.09	-
GA & FE-R	0.21	-	0.09	-	0.12	-	0.19	-	0.153	0.06	-
GA & SG-R	0.32*	-	0.12	-	0.2	-	0.2	-	0.21	0.08	0.2
GA & FC	0.26	-	0.19	-	0.18	-	0.1	-	0.183	0.07	-

*$p < 0.05$; **$p < 0.01$

As Table B.26 shows, GPA (English) was positively correlated with coursework, final exam (with and without Reading), semester grades (with and without reading) and first or continuing generation students. As might be expected, the mean correlation values between this prior knowledge construct and the study's criterion variables were all positive. In contrast, GPA (English) was negatively correlated with controlled motives (M = -0.169). The correlations between GPA (English) and

perceived competence (Time 2), autonomous motives (Time 2), and materialism (Time 2) were marginal and hence not shown.

Table B.26: Study 2, Time 2. GPA(English): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
GE & CO2	-0.13	-0.12	-0.21	-0.19	-0.15	-0.14	-0.21	-0.2	-0.169	0.04	-0.21
GE & CW	0.19	0.21	0.2	0.2	0.12	0.13	0.12	0.13	0.163	0.04	0.12, 0.13, 0.2
GE & FE	0.12	0.12	0.30*	0.29*	0.14	0.14	0.29*	0.29*	0.21	0.09	0.29
GE & SG	0.04	0.05	0.16	0.16	0.05	0.06	0.15	0.16	0.104	0.06	0.16
GE & FE-R	0.18	0.18	0.36**	0.36**	0.19	0.19	0.33**	0.34**	0.266	0.09	0.18, 0.19, 0.36
GE & SG-R	0.06	0.07	0.19	0.19	0.06	0.07	0.16	0.17	0.121	0.06	0.06, 0.07, 0.19
GE & FC	0.2	0.21	0.19	0.15	0.27*	0.28*	0.24	0.25*	0.224	0.04	-

*$p < 0.05$; **$p < 0.01$

SES(SE) As Table B.27 shows, SES (SE) was positively correlated with controlled motives at Time 2 (M = 0.129). The correlations between SES (SE) and perceived competence (Time 2), autonomous motives (Time 2), materialism (Time 2), and all the study's Time 2 criterion variables – with the exception of final exam (minus Reading), were marginal and hence not shown.

Table B.27: Study 2, Time 2. SES(SE): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
SE & CO2	0.15	0.16	0.13	0.13	0.15	0.15	0.08	0.08	0.129	0.03	0.15
SE & FE-R	0.1	0.08	0.1	0.12	0.1	0.1	0.13	0.13	0.108	0.02	0.1
SE & FC	0.38**	0.41**	0.38**	0.44**	0.38**	0.38**	0.38**	0.38**	0.391	0.02	0.38

*$p < 0.05$; **$p < 0.01$

SES(Scaled) As Table B.28 shows, the correlations between SES (Scaled) and the study's criterion variables at Time 2 were small, with a mean correlation value that did not exceed -0.17. However, all of them were consistently negative. Results also indicated there was a small, negative correlation between SES (Scaled) and autonomous motives at Time 2 (M = -0.133). The correlations between SES (Scaled) and perceived competence (Time 2), controlled motives (Time 2), and materialism (Time 2) were marginal and hence are not shown.

Perceived competence (Time 2) As Table B.29 shows, perceived competence (Time 2) and autonomous motives (Time 2) were positively correlated (M = 0.21). Small correlations were found between perceived competence (Time 2) and all study's

Table B.28: Study 2, Time 2. SES(Scaled): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
SS & AU2	-0.15	-0.14	-0.15	-0.12	-0.15	-0.13	-0.12	-0.1	-0.133	0.02	-0.15
SS & CW	-0.18	-0.21	-0.18	-0.19	-0.18	-0.17	-0.13	-0.12	-0.17	0.03	-0.18
SS & FE	-0.12	-0.18	-0.12	-0.17	-0.12	-0.12	-0.1	-0.09	-0.128	0.03	-0.12
SS & SG	-0.18	-0.23	-0.18	-0.21	-0.18	-0.17	-0.13	-0.12	-0.175	0.04	-0.18
SS & SG-R	-0.17	-0.22	-0.17	-0.2	-0.17	-0.16	-0.13	-0.12	-0.168	0.03	-0.17
SS & FC	0.57**	0.60**	0.57**	0.60**	0.57**	0.56**	0.59**	0.58**	0.58	0.01	0.57

*$p < 0.05$; **$p < 0.01$

Time 2 criterion variables. The correlations between perceived competence and controlled orientations, and between perceived competence and first or continuing students were marginal and hence not reported.

Table B.29: Study 2, Time 2. Perceived competence: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
PC2 & AU2	0.22*	0.19	0.19	0.22	0.22*	0.2	0.23*	0.21	0.21	0.02	0.22
PC2 & CW	0.16	0.23	0.09	0.15	0.16	0.18	0.06	0.09	0.14	0.06	0.09, 0.16
PC2 & FE	0.12	0.17	0.13	0.18	0.12	0.14	0.1	0.12	0.135	0.03	0.12, 0.13
PC2 & SG	0.17	0.23	0.14	0.2	0.17	0.19	0.11	0.13	0.168	0.04	0.17
PC2 & FE-R	0.14	0.18	0.16	0.2	0.14	0.16	0.14	0.16	0.16	0.02	0.14, 0.16
PC2 & SG-R	0.16	0.22	0.13	0.19	0.16	0.18	0.11	0.13	0.16	0.04	0.13, 0.16

*$p < 0.05$; **$p < 0.01$

Controlled motives As shown in Table B.30, the size of the correlation between controlled motives (Time 2) and autonomous motives (Time 2) was positive and medium (M = 0.6). In all cases the correlations between controlled orientations (Time 2) and the study's criterion variables at Time 2 were negative, with the largest mean correlation value between Controlled orientations (Time 2) and final exam (minus Reading) (M = -0.265). In contrast, the direction of the correlation between controlled motives (Time 2) and materialism (Time 2) was inconsistent. The correlation between controlled motives and first and continuing generation students was marginal and hence not shown.

Autonomous motives As shown in Table B.31, the correlations between autonomous motives (Time 2) and materialism (Time 2) were statistically significantly negative across all eight sets (M = -0.341). The correlations between autonomous motives (Time 2) and the study's criterion variables were consistently negative. In

Table B.30: Study 2, Time 2. Controlled motives: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
CO2 & AU2	0.65**	0.65**	0.56**	0.56**	0.65**	0.64**	0.55**	0.54**	0.6	0.05	0.65
CO2 & MA2	-0.14	-0.17	-0.01	-0.06	-0.14	-0.15	0.05	0.04	-0.073	0.09	-0.14
CO2 & CW	-0.11	-0.11	-0.06	-0.03	-0.11	-0.12	-0.1	-0.11	-0.094	0.03	-0.11
CO2 & FE	-0.22*	-0.17	-0.22	-0.11	-0.22*	-0.22	-0.24*	-0.24*	-0.205	0.04	-0.22
CO2 & SG	-0.2	-0.17	-0.19	-0.11	-0.2	-0.21	-0.23	-0.23	-0.193	0.04	-0.23
CO2 & FE-R	-0.29**	-0.26*	-0.26*	-0.18	-0.29**	-0.29**	-0.28*	-0.28*	-0.265	0.04	-0.29
CO2 & SG-R	-0.23*	-0.21	-0.21	-0.14	-0.23*	-0.24*	-0.24*	-0.25*	-0.218	0.03	-

*$p < 0.05$; **$p < 0.01$

the case of the correlation between autonomous motives (Time 2) and final exams (minus Reading), the correlation was statistically significantly negative across all eight data sets (M = -0.32). The correlations between autonomous motives (Time 2) and coursework were marginal, as were the correlations between autonomous motives (Time 2) and first and continuing generation students. Consequently, neither is shown.

Table B.31: Study 2, Time 2. Autonomous motives: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
AU2 & MA2	-0.36**	-0.40**	-0.36**	-0.33**	-0.36**	-0.40**	-0.23*	-0.29*	-0.341	0.06	-0.36
AU2 & FE	-0.27*	-0.24	-0.27*	-0.21	-0.27*	-0.28*	-0.30**	-0.31**	-0.269	0.03	-0.27
AU2 & SG	-0.2	-0.19	-0.2	-0.17	-0.2	-0.22	-0.24*	-0.27*	-0.211	0.03	-0.2
AU2 & FE-R	-0.32**	-0.30*	-0.32**	-0.24	-0.32**	-0.33**	-0.31**	-0.32**	-0.308	0.03	-0.32
AU2 & SG-R	-0.2	-0.19	-0.2	-0.16	-0.2	-0.22	-0.22	-0.25*	-0.205	0.03	-0.2

*$p < 0.05$; **$p < 0.01$

Materialism As indicated in Table B.32, materialism (Time 2) correlated with a single criterion variable at Time 2, which was Final exam minus Reading (M = 0.128). The correlations between materialism (Time 2) and coursework, final exams, semester grades, semester grades (minus Reading), and first and continuing generation students were marginal and hence not reported here.

Table B.32: Study 2, Time 2. Materialism: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
MA2 & FE-R	0.13	0.14	0.13	0.11	0.13	0.12	0.14	0.12	0.128	0.01	0.13

*$p < 0.05$; **$p < 0.01$

Criterion variables As indicated in Table B.33, Table B.34, Table B.35 and Table B.36 the mean value correlations between the study's criterion variables were all strongly and statistically significantly positive.

Table B.33: Study 2, Time 2. Coursework: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
CW & FE	0.68**	0.69**	0.68**	0.72**	0.68**	0.69**	0.72**	0.73**	0.699	0.02	0.68
CW & SG	0.86**	0.86**	0.86**	0.88**	0.86**	0.86**	0.87**	0.87**	0.865	0.01	0.86
CW & FE-R	0.67**	0.66**	0.67**	0.69**	0.67**	0.67**	0.70**	0.70**	0.679	0.02	0.67
CW & SG-R	0.87**	0.87**	0.87**	0.89**	0.87**	0.87**	0.88**	0.88**	0.875	0.01	0.87

*$p < 0.05$; **$p < 0.01$

Table B.34: Study 2, Time 2. Final exam: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
FE and SG	0.91**	0.91**	0.91**	0.91**	0.91**	0.92**	0.91**	0.92**	0.913	0.01	0.91
FE and FE-R	0.96**	0.96**	0.96**	0.96**	0.96**	0.97**	0.97**	0.97**	0.964	0.01	0.96
FE and SG-R	0.89**	0.89**	0.89**	0.89**	0.89**	0.90**	0.90**	0.91**	0.895	0.01	0.89

*$p < 0.05$; **$p < 0.01$

Table B.35: Study 2, Time 2. Semester grades: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
SG and FE-R	0.89**	0.87**	0.89**	0.88**	0.89**	0.89**	0.89**	0.90**	0.888	0.01	0.89
SG and SG-R	0.99**	0.99**	0.99**	0.99**	0.99**	0.99**	0.99**	0.99**	0.99	0	0.99

*$p < 0.05$; **$p < 0.01$

Table B.36: Study 2, Time 2. Final exams (minus Reading): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
FE-R & SG-R	0.89**	0.88**	0.89**	0.88**	0.89**	0.90**	0.90**	0.90**	0.891	0.01	0.89, 0.90

*$p < 0.05$; **$p < 0.01$

Division 3: correlations between T1 predictors and T2 criterion variables only

Results showing the correlations between Time 1 psychological predictors and Time 2 criterion variables are now given in the tables below. Because a number of results also appear in Division 1, the results in this section begin with the correlations between perceived competence (Time 1) and final exam (and not coursework as the correlations were marginal).

Perceived competence As Table B.37 shows, the positive correlations between perceived competence (Time 1) and final exam scores were small but identical in six of the eight sets (M = 0.243). Indeed, the correlations between perceived competence at Time 1 and the study's other criterion variables - semester grades, final exams (minus Reading), and semester grades (minus Reading) - remained at or above 0.20 across all sets. The correlation between perceived competence (Time 1) and coursework was marginal and hence is not shown here.

Table B.37: Study 2, Time 1 with Time 2 criterions. Perceived competence: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
PC1 & FE	0.25*	0.25	0.25*	0.25*	0.25	0.25	0.22	0.22	0.243	0.01	0.25
PC1 & SG	0.22	0.22	0.22	0.23*	0.22	0.22	0.22	0.22	0.221	0.01	0.22
PC1 & FE-R	0.24*	0.24	0.24*	0.24*	0.24	0.24	0.21	0.21	0.233	0.01	0.24
PC1 & SG-R	0.2	0.2	0.2	0.21	0.21	0.21	0.2	0.2	0.204	0.01	0.2

*$p < 0.05$; **$p < 0.01$

Controlled motives As Table B.38 shows, the negative correlations between controlled motives (Time 1) and final exam (M = -0.098) and final exam (minus Reading) (M = -0.103) were close to marginal. The correlations between controlled motives and coursework, semester grades, and semester grades (minus reading) were marginal and hence are not shown here.

Autonomous motives As Table B.39 shows, the correlation between autonomous motives (Time 1) and coursework was small and positive (M = 0.114). In contrast, autonomous motives (Time 1) was negatively correlated with final exams (with

Table B.38: Study 2, Time 1 with Time 2 criterions. Controlled motives: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
CO1 & FE	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.09	-0.09	-0.098	0.01	0.1
CO1 & FE-R	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.08	-0.08	-0.103	0.01	-0.11

$^{*}p < 0.05$; $^{**}p < 0.01$

and without Reading). The correlations between autonomous motives (Time 1) and materialism (Time 1) and semester grades (with and without Reading) were marginal and hence not reported here.

Table B.39: Study 2, Time 1 with Time 2 criterions. Autonomous motives: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
AU1 & CW	0.12	0.12	0.12	0.15	0.12	0.12	0.08	0.08	0.114	0.02	0.12
AU1 & FE	-0.19	-0.19	-0.19	-0.19	-0.19	-0.19	-0.23*	-0.23	-0.2	0.02	-0.19
AU1 & FE-R	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.21	-0.21	-0.18	0.02	-0.17

$^{*}p < 0.05$; $^{**}p < 0.01$

Materialism As Table B.40 shows, the correlation between final exams (minus Reading) and materialism (Time 1) was small (M = 0.114). The correlation between materialism (Time 1) and all the other current study's Time 2 criterion variables were marginal and hence now shown.

Table B.40: Study 2, Time 1 with Time 2 criterions. Materialism: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
MA1 & FE-R	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.114	0.01	0.13

$^{*}p < 0.05$; $^{**}p < 0.01$

Division 4: correlations between T1 predictors and T2 predictors

Results showing the correlations between Time 1 psychological predictors (plus the continuing or first generation variable) and Time 2 psychological predictors are now given in the tables below. These correlations give an indication of the test-retest reliability of the measures used.

Perceived competence (Time 1) As Table B.41 shows, the correlation between perceived competence (Time 1) and perceived competence (Time 2) was large and positive (M = 0.615, SD = 0.0588). Correlations between perceived competence (Time 1) and continuing or first generation, controlled orientations (Time 2), and autonomous orientations (Time 2) were marginal and hence not shown here.

Table B.41: Study 2, Time 1 predictors. Perceived competence: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
PC1 & PC2	0.56**	0.56**	0.67**	0.67**	0.56**	0.56**	0.67**	0.67**	0.615	0.06	0.56, 0.67
PC1 & CO1	0.12	0.13	0.12	0.13	0.12	0.12	0.15	0.15	0.13	0.01	0.12
PC1 & AU1	0.18	0.19	0.18	0.17	0.18	0.19	0.17	0.17	0.179	0.01	0.17, 0.18
PC1 & MA1	-0.19	-0.19	-0.16	-0.17	-0.19	-0.19	-0.16	-0.16	-0.176	0.02	-0.19
PC1 & MA2	-0.11	-0.12	-0.11	-0.12	-0.11	-0.12	-0.11	-0.12	-0.115	0.01	-0.11, -0.12

*$p < 0.05$; **$p < 0.01$

Perceived competence (Time 2) As Table B.42 shows, the correlation between controlled motives (Time 1) and perceived competence (Time 2) was small and positive (M = 0.169). In addition, the correlations between autonomous orientations (Time 1) and Autonomous orientations (Time 2) with Perceived competence (Time 2) were small and, across the majority of the data sets, statistically significant. Perceived competence (Time 2) was only marginally correlated with controlled motives (Time 2) and hence is not shown here. Similarly, correlations between perceived competence (Time 2) and continuing or first generation and materialism (Time 2) were marginal and hence are not shown.

Table B.42: Study 2, Time 2 predictors. Perceived competence: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
PC2 & CO1	0.14	0.15	0.19	0.21	0.13	0.14	0.19	0.2	0.169	0.03	0.14, 0.19
PC2 & AU1	0.24*	0.25*	0.23*	0.22	0.24*	0.25*	0.19	0.2	0.228	0.02	0.24
PC2 & AU2	0.22*	0.22*	0.19	0.24*	0.22*	0.22*	0.23*	0.23*	0.221	0.01	0.22

*$p < 0.05$; **$p < 0.01$

Controlled motives (Time 1) As Table B.43 shows, the mean correlation between controlled motives (Time 1) and controlled motives (Time 2) was positive and large (M = 0.753, SD = 0.0219).

Table B.43: Study 2, Time 1 predictors. Controlled motives: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
CO1 & CO2	0.73**	0.74**	0.77**	0.78**	0.73**	0.73**	0.77**	0.77**	0.753	0.02	0.77
CO1 & AU1	0.52**	0.52**	0.52**	0.54**	0.53**	0.53**	0.54**	0.54**	0.53	0.01	0.54
CO1 & AU2	0.50**	0.51**	0.50**	0.50**	0.52**	0.52**	0.49**	0.49**	0.504	0.01	0.5
CO1 & MA1	0.12	0.12	0.15	0.23*	0.11	0.11	0.23*	0.23*	0.163	0.06	0.23

*$p < 0.05$; **$p < 0.01$

Controlled motives (Time 2) As Table B.44 shows, the size of the correlation between autonomous motives (Time 1) and controlled motives (Time 2) was small (M = 0.44). The correlation between controlled motives (Time 2) and autonomous motives (Time 2) (M = 0.605) was medium. The mean correlation between controlled motives (Time 2) and materialism (Time 2) was marginal and not shown. Neither was the correlation between controlled motives and continuing or first generation students.

Table B.44: Study 2, Time 2 predictors. Controlled motives: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
CO2 & AU1	0.38**	0.38**	0.50**	0.52**	0.38**	0.38**	0.49**	0.49**	0.44	0.07	0.38
CO2 & AU2	0.65**	0.65**	0.56**	0.58**	0.65**	0.65**	0.55**	0.55**	0.605	0.05	0.65
CO2 & MA1	-0.18	-0.18	-0.04	0.01	-0.18	-0.18	0.02	0.02	-0.089	0.1	-0.18

*$p < 0.05$; **$p < 0.01$

Autonomous motives (Time 1) As Table B.45 shows, the mean correlation between autonomous motives at Time 1 and Time 2 was large (M = 0.764, SD = 0.0605). The correlations between autonomous motives (Time 1) and first and continuing generation students were marginal and thus not shown.

Table B.45: Study 2, Time 1 predictors. Autonomous motives: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
AU1 & AU2	0.72**	0.72**	0.72**	0.84**	0.72**	0.72**	0.83**	0.84**	0.764	0.06	0.72
AU1 & MA1	-0.11	-0.11	-0.05	-0.09	-0.11	-0.11	-0.08	-0.08	-0.093	0.02	-0.11
AU1 & MA2	-0.25*	-0.25*	-0.25*	-0.21	-0.25*	-0.25*	-0.18	-0.18	-0.228	0.03	-0.25

*$p < 0.05$; **$p < 0.01$

Autonomous motives (Time 2) As Table B.46 shows, the correlations between autonomous motives (Time 2) and materialism at Time 1 and 2 were negative. The size of the mean correlation between materialism (Time 2) and autonomous motives (Time 2) was small (M = -0.315) and statistically significant in all data sets. The correlations between autonomous motives (Time 2) and first and continuing generation students were marginal and are hence not shown.

Table B.46: Study 2, Time 2 predictors. Autonomous motives: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
AU2 & MA1	-0.19	-0.19	-0.16	-0.14	-0.19	-0.19	-0.14	-0.14	-0.168	0.03	-0.19
AU2 & MA2	-0.36**	-0.36**	-0.36**	-0.26*	-0.36**	-0.36**	-0.23*	-0.23*	-0.32	0.06	-0.36

*$p < 0.05$; **$p < 0.01$

Materialism (Time 2) Table B.47 shows the relevant correlations. The mean correlation between materialism (Time 2) and materialism (Time 1) was 0.61.

Table B.47: Study 2, Time 1 predictors. Materialism: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Set 5	Set 6	Set 7	Set 8	Mean	SD	Modal(s)
MA1 & MA2	0.61**	0.61**	0.56**	0.63**	0.61**	0.61**	0.63**	0.63**	0.61	0.02	0.61

*$p < 0.05$; **$p < 0.01$

Division 5: the change predictor variables and the study's criterion variables

The following results show the correlations between the current study's personal characteristics predictors, its psychological change variables, and its criterion variables. The predictor first and continuing generation students has not been included because its correlations with the change variables were all marginal (i.e., below 0.1). The four sets examined are non-imputed. Set 1 is with outliers and pairwise. Set 2 is with outliers and listwise. Set 3 is without outliers and pairwise. Set 4 is without outliers and listwise.

Gender Table B.48 shows the relevant correlations between gender, the non-motivational resource predictors, and the motivational resources change variables. Both SES measures were statistically significantly negatively correlated with gender.

Table B.48: Study 2, change predictors. Gender: correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Mean	Modal(s)
GN & SE	-0.384**	-0.409**	-0.384**	-0.363**	-0.39	-0.38
GN & SS	-0.262*	-0.240*	-0.262*	-0.198	-0.24	-0.26
GN & GE	-0.262	-0.285	-0.204	-0.243	-0.25	-
GN & CO2-T1	0.144	0.134	0.203	0.221	0.18	-
GN & PC2-1	0.104	0.157	0.075	0.173	0.13	-
GN & MA2-1	0.068	0.108	0.069	0.174	0.1	-
GN & FE	-0.124	-0.179	-0.124	-0.248*	-0.17	-0.12

*$p < 0.05$; **$p < 0.01$

SES(SE) Table B.49 shows the relevant correlations between SES(SE), the non-motivational resource predictors, and the motivational resources change variables. Only SES (SE) and SES (SS) were non-marginally correlated.

Table B.49: Study 2, change predictors. SES(SE): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Mean	Modal(s)
SE & SS	0.449**	0.524**	0.449**	0.515**	0.48	0.449

*$p < 0.05$; **$p < 0.01$

SES(SS) Table B.50 shows the relevant correlations between SES(SE), the non-motivational resource predictors, and the motivational resources change variables. SES (SS) was negatively correlated with all the criterion variables in Set 1-4.

Table B.50: Study 2, change predictors. SES(SS): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Mean	Modal(s)
SS & GE	0.124	0.121	0.086	0.085	0.1	-
SS & MA2-1	0.128	0.155	0.128	0.103	0.13	0.128
SS & CW	-0.177	-0.205	-0.177	-0.184	-0.19	-0.177
SS & FE	-0.124	-0.183	-0.124	-0.169	-0.15	-0.124
SS & SG	-0.176	-0.233	-0.176	-0.21	-0.20	-0.176

*$p < 0.05$; **$p < 0.01$

GPA(English) Table B.51 shows the relevant correlations between GPA(English), the non-motivational resource predictors, and the motivational resources change variables. In just one set (Set 4) was a statistically significant correlation found between GPA(English) and final exam.

Table B.51: Study 2, change predictors. GPA(English): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Mean	Modal(s)
GE & AU2-1	-0.109	-0.108	-0.204	-0.182	-0.15	-
GE & CO2-1	-0.201	-0.208	-0.225	-0.232	-0.22	-
GE & MA2-1	-0.188	-0.182	-0.201	-0.167	-0.18	-
GE & CW	0.188	0.205	0.203	0.205	0.20	0.205
GE & FE	0.117	0.115	0.299*	0.294*	0.21	-

*$p < 0.05$; **$p < 0.01$

AU(T2-T1) Table B.52 shows the relevant correlations between AU(T2-T1), the non-motivational resource predictors, and the motivational resources change variables. The correlation between AU(T2-T1) and CO(T2-T1) was statistically significant across three sets.

Table B.52: Study 2, change predictors. Autonomous motives (T2-T1): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Mean	Modal(s)
AU2-1 & CO2-1	0.489**	0.478**	0.248*	0.221	0.36	-
AU2-1 & PC2-1	0.127	0.142	0.12	0.175	0.14	-
AU2-1 & CW	-0.182	-0.175	-0.182	-0.198	-0.18	-0.182
AU2-1 & FE	-0.118	-0.14	-0.118	-0.09	-0.12	-0.118
AU2-1 & SG	-0.175	-0.184	-0.175	-0.174	-0.18	-0.175

*$p < 0.05$; **$p < 0.01$

CO(T2-T1) Table B.53 shows the relevant correlations between CO(T2-T1), the non-motivational resource predictors, and the motivational resources change variables. The controlled motives change variable was statistically significantly correlated with semester grades across all sets.

Table B.53: Study 2, change predictors. Controlled motives (T2-T1): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Mean	Modal(s)
CO2-1 & MA2-1	0.11	0.127	0.155	0.143	0.13	-
CO2-1 & CW	-0.238*	-0.248*	-0.217	-0.201	-0.23	-
CO2-1 & FE	-0.214	-0.272*	-0.206	-0.272*	-0.24	-0.272
CO2-1 & SG	-0.253*	-0.288*	-0.251*	-0.275*	-0.27	-

*$p < 0.05$; **$p < 0.01$

PC(T2-T1) Table B.54 shows the relevant correlations between PC(T2-T1), the non-motivational resource predictors, and the motivational resources change vari-

ables.

Table B.54: Study 2, change predictors. Perceived competence (T2-T1): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Mean	Modal(s)
PC2-1 & MA2-1	-0.347**	-0.397**	-0.056	-0.085	-0.22	-

*$p < 0.05$; **$p < 0.01$

MA(T2-T1) Table B.55 shows the relevant correlations between MA(T2-T1), the non-motivational resource predictors, and the motivational resources change variables. Only the correlation between MA(T2-T1) and CW was non-marginal.

Table B.55: Study 2, change predictors. Materialism (T2-T1): correlations across all sets

	Set 1	Set 2	Set 3	Set 4	Mean	Modal(s)
MA2-1 & CW	-0.147	-0.209	-0.147	-0.131	-0.16	-0.147

*$p < 0.05$; **$p < 0.01$

B.2 Regression results

Results from regression analyses are presented in this section. First, results from study 1 are presented; then study 2.

Table B.56: Study 1, model 1. Coursework

Variable	B	Std. Error	β	t	Sig.
(Constant)	62.044	30.188	-	2.055	0.043
GN	-12.893	2.530	-0.484	-5.095	0.000
SS	-15.248	4.851	-0.304	-3.143	0.002
SE	-0.021	0.068	-0.034	-0.312	0.756
IE	0.756	4.006	0.018	0.189	0.851
GE	0.344	0.228	0.162	1.511	0.135
GA	0.108	0.243	0.045	0.445	0.657
AU	-4.802	2.978	-0.174	-1.613	0.111
CO	4.713	3.490	0.138	1.350	0.181
MA	-0.759	1.750	-0.044	-0.434	0.666
PC	1.098	1.592	0.069	0.690	0.492
FC	0.600	3.913	0.015	0.153	0.879

N = 93

GN = Gender, SS = Socio-Economic Status (Scaled), SE = Socio-Economic Status (Standardized and weighted), IE = IELTS exam result, GE = Grade Point Average for English only, GA = Grade Point Average for all school subjects, AU = Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence, FC = First and continuing generation

Table B.57: Study 1, model 2. Coursework

Variable	B	Std. Error	β	t	Sig.
(Constant)	67.323	9.208	-	7.311	0.000
AU	-3.078	2.221	-0.124	-1.392	0.166
CO	5.707	2.497	0.190	2.286	0.024
MA	-2.492	1.095	-0.186	-2.275	0.024
PC	0.234	1.098	0.018	0.213	0.832

N = 166

AU = Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence

Table B.58: Study 1, model 1. Final exam

Variable	B	Std. Error	β	t	Sig.
(Constant)	-7.491	33.292	-	-0.225	0.823
GN	-0.526	2.791	-0.020	-0.189	0.851
SS	-6.889	5.350	-0.139	-1.288	0.201
SE	-.080	.074	-0.128	-1.075	0.285
IE	13.923	4.418	0.339	3.151	0.002
GE	0.321	0.251	0.152	1.279	0.204
GA	0.040	0.268	0.017	0.150	0.882
AU	-4.540	3.284	-0.165	-1.382	0.171
CO	-0.352	3.849	-0.010	-0.091	0.927
MA	1.745	1.930	0.102	0.904	0.369
PC	0.555	1.756	0.035	0.316	0.753
FC	-3.276	4.315	-0.084	-0.759	0.450

N = 93

GN = Gender, SS = Socio-Economic Status (Scaled), Socio-Economic Status (Standardized and weighted), IE = IELTS exam result, GE = Grade Point Average for English only, GA = Grade Point Average for all school subjects, AU = Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence, FC = First and continuing generation

Table B.59: Study 1, model 2. Final exam

Variable	B	Std. Error	β	t	Sig.
(Constant)	53.560	10.841	-	4.940	0.000
AU	-3.693	2.603	-0.129	-1.419	0.158
CO	1.765	2.940	0.051	0.600	0.549
MA	-0.460	1.289	-0.030	-0.357	0.722
PC	1.274	1.292	0.083	0.986	0.326

N = 166

AU = Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence

Table B.60: Study 1, model 1. Semester grades

Variable	B	Std. Error	β	t	Sig.
(Constant)	22.171	25.226	-	0.879	0.382
GN	-6.230	2.114	-0.291	-2.947	0.004
SS	-12.172	4.054	-0.302	-3.003	0.004
SE	-0.020	0.056	-0.040	-0.363	0.718
IE	6.963	3.348	0.209	2.080	0.041
GE	0.324	0.190	0.189	1.705	0.092
GA	0.151	0.203	0.078	0.743	0.460
AU	-4.526	2.488	-0.204	-1.819	0.073
CO	1.143	2.917	0.042	0.392	0.696
MA	0.719	1.462	0.052	0.492	0.624
PC	1.113	1.331	0.087	0.836	0.405
FC	-0.506	3.270	-0.016	-0.155	0.877

N = 93

GN = Gender, SS = Socio-Economic Status (Scaled), Socio-Economic Status (Standardized and weighted), IE = IELTS exam result, GE = Grade Point Average for English only, GA = Grade Point Average for all school subjects, AU = Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence, FC = First and continuing generation

Table B.61: Study 1, model 2. Semester grades

Variable	B	Std.Error	β	t	Sig.
(Constant)	59.275	8.402	-	7.055	.000
AU	-2.736	2.017	-0.122	-1.356	0.177
CO	3.002	2.278	0.111	1.318	0.189
MA	-1.483	0.999	-0.123	-1.485	0.140
PC	0.874	1.001	0.073	0.873	0.384

N = 166

AU = Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence

Table B.62: Study 2, T1, model 1. Mid-term exam scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	97.095	19.613	-	4.950	0.000
GN	-0.947	2.685	-0.049	-0.353	0.726
SS	-11.407	5.031	-0.368	-2.267	0.027
SE	0.103	0.072	0.214	1.429	0.158
GE	-0.160	0.142	-0.143	-1.126	0.265
AU1	-2.591	2.264	-0.157	-1.144	0.257
CO1	0.361	2.758	0.018	0.131	0.896
MA1	1.478	1.189	0.155	1.243	0.219
PC1	2.954	1.234	0.292	2.394	0.020
FC	1.268	2.922	0.068	0.434	0.666

N = 69

GN = Gender, SS = SES (Scaled), SE = SES (Standardized and weighted), GE = GPA (English only), 1 = Time 1, AU = Autonomous motives, CO = Controlled motives, MA = Materialism, Perceived competence, FC = First and continuing generation

Table B.63: Study 2, T1, model 2. Mid-term exam scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	68.266	9.130	-	7.477	0.000
AU1	-1.805	2.119	-0.109	-0.852	0.397
CO1	-0.399	2.508	-0.020	-0.159	0.874
MA1	1.331	1.160	0.133	1.147	0.255
PC1	2.662	1.108	0.275	2.402	0.019

N = 80

1 = Time 1, AU = Autonomous motives, CO = Controlled motives, MA = Materialism, Perceived competence

Table B.64: Study 2, T2, model 1. Coursework scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	74.408	15.143	-	4.914	0.000
GN	-0.422	2.103	-0.028	-0.201	0.842
SS	-9.416	4.118	-0.381	-2.287	0.026
SE	0.015	0.060	0.038	0.247	0.805
GE	0.180	0.114	0.202	1.575	0.121
AU2	-1.989	2.395	-0.153	-0.831	0.409
CO2	0.548	2.492	0.038	0.220	0.827
MA2	-0.433	0.980	-0.059	-0.442	0.660
PC2	1.522	0.830	0.227	1.833	0.072
FC	3.049	2.344	0.204	1.301	0.198

N = 69

GN = Gender, SS = SES (Scaled), SE = SES (Standardized and weighted), GE = GPA (English only), 2 = Time 2, AU = Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence, FC = First and continuing generation

Table B.65: Study 2, T2, model 2. Coursework scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	77.107	7.009	-	11.001	0.000
AU2	0.368	2.224	0.027	0.165	0.869
CO2	-1.992	2.353	-0.130	-0.847	0.400
MA2	-0.169	0.909	-0.023	-0.186	0.853
PC2	1.029	0.806	0.152	1.277	0.205

N = 80

2 = Time 2, AU = Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence

Table B.66: Study 2, T2, model 3b. Coursework scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	-3.117	10.529	-	-0.296	0.768
GN	1.846	1.288	0.121	1.434	0.156
GE	0.320	0.077	0.353	4.153	0.000
AU2	2.436	1.071	0.189	2.275	0.026
MID	0.606	0.067	0.755	9.075	0.000

N = 73

GN = Gender, GE = GPA (English only), 2 = Time 2, AU = Autonomous motives, MID = Mid-term exam results

Table B.67: Study 2, T2, model 1. Final exam scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	88.444	17.658	-	5.009	0.000
GN	-4.538	2.452	-0.245	-1.851	0.069
SS	-11.384	4.802	-0.379	-2.371	0.021
SE	0.038	0.070	0.082	0.548	0.586
GE	0.075	0.133	0.070	0.566	0.573
AU2	-6.231	2.792	-0.395	-2.231	0.029
CO2	1.378	2.906	0.078	0.474	0.637
MA2	0.231	1.143	0.026	0.202	0.841
PC2	1.910	0.968	0.235	1.973	0.053
FC	1.308	2.733	0.072	0.479	0.634

N = 69

GN = Gender, SS = SES (Scaled), SE = SES (Standardized and weighted), GE = GPA (English only), 2 = Time 2, AU = Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence, FC = First and continuing generation

Table B.68: Study 2, T2, model 2. Final exam scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	75.375	8.339	-	9.038	0.000
AU2	-4.978	2.646	-0.300	-1.881	0.064
CO2	-0.489	2.800	-0.026	-0.174	0.862
MA2	-0.025	1.081	-0.003	-0.023	0.982
PC2	1.584	0.959	0.189	1.653	0.103

N = 80

2 = Time 2, AU = Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence

Table B.69: Study 2, T2, model 3b. Final exam scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	-2.704	11.810	-	-0.229	0.820
GN	-2.156	1.744	-0.116	-1.236	0.221
SE	-0.022	0.042	-0.046	-0.513	0.610
GE	0.211	0.094	0.195	2.246	0.028
MID	0.718	0.080	0.741	8.926	0.000

N = 65

GN = Gender, SE = SES (Standardized and weighted), GE = GPA (English only), MID = Mid-term exam results

Table B.70: Study 2, T2, model 1. Semester grades

Variable	B	Std. Error	β	t	Sig.
(Constant)	93.564	15.059	-	6.213	0.000
GN	-2.645	2.091	-0.168	-1.265	0.211
SS	-11.023	4.095	-0.434	-2.692	0.009
SE	0.042	0.060	0.106	0.707	0.482
GE	0.020	0.114	0.022	0.179	0.859
AU2	-4.608	2.381	-0.345	-1.935	0.058
CO2	0.796	2.478	0.053	0.321	0.749
MA2	0.079	0.975	0.010	0.081	0.936
PC2	1.895	0.826	0.275	2.295	0.025
FC	1.847	2.331	0.120	0.792	0.431

N = 69

GN = Gender, SS = SES (Scaled), SE = SES (Standardized and weighted), GE = GPA (English only), 2 = Time 2, AU + Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence, FC = First and continuing generation

Table B.71: Study 2, T2, model 2. Semester grades

Variable	B	Std. Error	β	t	Sig.
(Constant)	77.240	7.055	-	10.948	0.000
AU2	-2.831	2.239	-0.204	-1.265	0.210
CO2	-1.058	2.369	-0.066	-0.447	0.657
MA2	-0.026	0.915	-0.003	-0.028	0.978
PC2	1.513	0.811	0.215	1.866	0.066

N = 80

2 = Time 2, AU = Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence

Table B.72: Study 2, T2-1, model 1. Coursework scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	81.295	12.246	-	6.638	0.000
GN	0.023	2.138	0.001	0.011	0.991
SS	-8.729	4.107	-0.353	-2.125	0.038
SE	0.018	0.059	0.047	0.304	0.762
GE	0.128	0.115	0.143	1.106	0.273
AU2-1	-1.680	2.303	-0.100	-0.730	0.469
CO2-1	-3.217	2.682	-0.167	-1.199	0.235
MA2-1	-0.567	1.177	-0.066	-0.482	0.632
PC2-1	0.611	0.961	0.085	0.636	0.528
FC	2.843	2.292	0.190	1.240	0.220

N = 69

GN = Gender, SS = SES (Scaled), SE = SES (Standardized and weighted), GE = GPA (English only), 1 = Time 1, 2 = Time 2, AU = Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence, FC = First and continuing generation

Table B.73: Study 2, T2-1, model 2. Coursework scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	77.842	0.889	-	87.567	0.000
AU2-1	-2.006	2.305	-0.112	-0.870	0.387
CO2-1	-3.521	2.648	-0.171	-1.330	0.188
MA2-1	-0.966	1.044	-0.110	-0.925	0.358
PC2-1	0.508	0.915	0.066	0.556	0.580

N = 80

1 = Time 1, 2 = Time 2, AU = Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence

Table B.74: Study 2, T2-1, model 3b. Coursework scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	14.024	8.932	-	1.570	0.121
GE	0.252	0.076	0.277	3.294	0.002
MA2-1	-1.115	0.711	-0.130	-1.570	0.121
MID	0.565	0.066	0.704	8.507	0.000

N = 73

GN = Gender, 1 = Time 1, 2 = Time 2, MA = Materialism, MID = Mid-term exam results

Table B.75: Study 2, T2-1, model 1. Final exam scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	79.407	15.042	-	5.279	0.000
GN	-2.540	2.627	-0.137	-0.967	0.337
SS	-10.807	5.045	-0.360	-2.142	0.036
SE	0.074	0.073	0.157	1.010	0.317
GE	0.072	0.142	0.066	0.507	0.614
AU2-1	-0.190	2.829	-0.009	-0.067	0.947
CO2-1	-5.898	3.294	-0.252	-1.791	0.078
MA2-1	1.008	1.446	0.097	0.697	0.489
PC2-1	-0.420	1.180	-0.048	-0.356	0.723
FC	1.136	2.815	0.063	0.404	0.688

N = 69
GN = Gender, SS = SES (Scaled), SE = SES (Standardized and weighted), GE = GPA (English only), 1 = Time 1, 2 = Time 2, AU = Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence, FC = First and continuing generation

Table B.76: Study 2, T2-1, model 2. Final exam scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	66.951	1.115	-	60.033	0.000
AU2-1	0.012	2.892	0.001	0.004	0.997
CO2-1	-5.521	3.322	-0.216	-1.662	0.101
MA2-1	0.156	1.309	0.014	0.119	0.905
PC2-1	-0.945	1.148	-0.099	-0.824	0.413

N = 80
1 = Time 1, 2 = Time 2, AU = Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence

Table B.77: Study 2, T2-1, model 3b. Final exam scores

Variable	B	Std. Error	β	t	Sig.
(Constant)	-9.605	10.823	-	-0.887	0.378
SE	0.003	0.038	0.007	0.084	0.933
GE	0.253	0.090	0.234	2.817	0.006
PC2-1	-0.905	0.715	-0.104	-1.266	0.210
MID	0.728	0.080	0.752	9.080	0.000

N = 69
SE = SES (Standardized and weighted), GE = GPA (English), 1 = Time 1, 2 = Time 2, PC = Perceived competence, MID = Mid-term exam results

Table B.78: Study 2, T2-1, model 1. Semester grades

Variable	B	Std. Error	β	t	Sig.
(Constant)	91.011	12.666	-	7.185	0.000
GN	-1.267	2.212	-0.081	-0.573	0.569
SS	-10.313	4.248	-0.406	-2.427	0.018
SE	0.061	0.061	0.155	1.002	0.320
GE	-0.006	0.119	-0.007	-0.051	0.960
AU2-1	-1.307	2.382	-0.076	-0.549	0.585
CO2-1	-5.047	2.774	-0.255	-1.820	0.074
MA2-1	0.423	1.217	0.048	0.348	0.729
PC2-1	0.223	0.994	0.030	0.224	0.824
FC	1.623	2.370	0.106	0.685	0.496

N = 69

GN = Gender, SS = SES (Scaled), SE = SES (Standardized and weighted), GE = GPA (English only), 1 = Time 1, 2 = Time 2, AU = Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence, FC = First and continuing generation

Table B.79: Study 2, T2-1, model 2. Semester grades

Variable	B	Std. Error	β	t	Sig.
(Constant)	73.449	0.927	-	79.212	0.000
AU2-1	-1.232	2.404	-0.066	-0.512	0.610
CO2-1	-4.666	2.762	-0.218	-1.689	0.095
MA2-1	-0.201	1.089	-0.022	-0.185	0.854
PC2-1	-0.165	0.954	-0.021	-0.173	0.863

N = 80

1 = Time 1, 2 = Time 2, AU = Autonomous motives, CO = Controlled motives, MA = Materialism, PC = Perceived competence

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