

**PROMOTING POTENTIAL: A MIXED METHODS STUDY EVALUATING
THE IMPACT OF DIFFERING SCHOOL SETTINGS ON HIGH
ACHIEVING STUDENTS' ACADEMIC AND PSYCHOSOCIAL
OUTCOMES**

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Lucy Hobby

This thesis is dedicated to my best friend and husband, Jason;
without your unwavering love and support, none of this would have been possible.

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you will always be my life's greatest achievements.

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ABSTRACT

Provision of the optimal educational environment for the nation's high academic achievers is of critical importance, so as to enable these students to attain their full potential. In New South Wales (NSW), Australia, one of the principal governmental measures employed to achieve this end has been the establishment of specialist academically selective schools. This practice is entrenched in deep tradition and based on assumptions about the benefits of these schools, rather than on a measured response grounded in methodologically sound, evidence-based research. This project begins to address this gap in the research with a sound, multidimensional assessment of the differential impact of contrasting school settings (academically selective and mixed-achievement comprehensive schools) on the academic achievement and psychosocial health outcomes of secondary students. A mixed-methods research design was employed in which 1,993 students completed a survey on two occasions, and select students participated in focus group interviews. Analyses reveal that the selective students outperformed the high achievers in the mixed-achievement schools across all achievement domains. However, the selective students reported significantly lower Mathematics, English, and General School academic self-concepts, more negative perceptions of their relationships with their parents, an increased experience of competition and comparison, and greater school life worries than did their counterparts in the comprehensive settings. Moreover, the findings highlight the individual characteristics that served to enhance or impede students' psychosocial wellbeing and academic success across time, and the consistency of these relations across educational setting. In addition to school setting, the cultural background of students, for those who self-identified as being of Asian Australian heritage, also emerged as a critical factor in shaping students' school lives. This study supports the notion that not all high achieving students will benefit from the same type of educational setting. The findings imply that interventions targeted at improving self-concept for students within selective schools, and parental education regarding strategies that foster achievement and wellbeing could be beneficial, to ensure all high achieving students are reaching their full potential.

CHAPTER 1 INTRODUCTION

It has been more than a quarter of century since the NSW Government conducted research into this critical educational issue. Why has there not been a systematic evaluation of the effects of selective schools on a whole range of outcomes, including achievement, academic self-concept, educational aspirations, university attendance, etc.? Where is the solid research upon which to base decisions about maintaining, increasing, or decreasing the numbers of students attending selective schools? Given the controversy surrounding the Vinson report, there is a clear challenge to the NSW Government to initiate such a research program. Or maybe we will just wait until the next time this issue erupts and again ask why educational decisions are based on political expediency instead of good research.

(Marsh, 2002b, p. 11)

Few topics within the education arena have the ability to ignite such deep and polarising debate amongst key stakeholders, policy makers, academics, educators, parents, and students alike than does the issue of academically selective schools. Indeed, the question of whether high academically achieving students, on the basis of their perceived academic capabilities, should be segregated and taught together in specialised selective schools, or remain with students of all levels of achievement in comprehensive schools, has been one of the most controversial topics in NSW for decades. In NSW, the number of selective schools is particularly high in comparison to other Australian states and territories (NSW Department of Education and Communities, 2013b).

Despite the fact that selective schools were first established in 1883, when it comes to matters of educational policy they are a critical and contentious issue at the forefront of the media in the present day (e.g., Smith, 2014; Smith & Browne, 2014; Tovey & Ting, 2014). This is because selective schools in NSW have remained a

socio-political issue, influenced by market demands, parental pressures, and government interests, as opposed to a purely educational concern that requires empirical investigation as to the relative advantages and disadvantages for the students who attend them (Craven, Marsh, & Print, 2000; Vinson, 2002). Hence, it is the central aim of the present investigation to conduct a rigorous quantitative and qualitative examination of the comparative effects of differing school settings (academically selective and mixed-achievement comprehensive) on high achieving students' academic achievement and psychosocial wellbeing outcomes.

That we should uncover the most effective way to educate and nurture our high achieving students is an aim of major interest in Australia and throughout the world. The importance of providing the best and most appropriate education to meet the unique and varied needs of students of all capabilities is vital for enhancing the intellectual climate of our nation, for strengthening our socioeconomic foundations, and for supporting all students to reach their fullest potential in all aspects of life. The assertion is frequently made that high academic achievers require the motivation and challenges that come from working with other, similarly achieving peers, in order to maximise their academic success (Gross, 1999; 2011).

However, there is an alternative, and empirically based view, that not all students benefit from the same type of educational provision, even if some students do benefit (see Marsh & Craven, 1994). An extensive body of research suggests that segregating students on the basis of their perceived academic capabilities may not engender the most optimal educational context for all high achieving students (e.g., Craven et al., 2000; Marsh & Hau, 2003; Marsh, Seaton, et al., 2008; Marsh, Trautwein, Lüdtke, Baumert, & Köller, 2007). For three decades, this research has argued that attending academically selective environments might well have a disadvantageous impact on a significant number of students' self-perceptions of their academic capabilities: their academic self-concepts. This phenomenon is termed the big-fish-little-pond-effect (BFLPE), in which it is consistently shown that students who are educated in schools where the academic standard of their peers is high, have lower academic self-concepts than their equally achieving counterparts in lower achievement contexts (e.g., Marsh, 1987a; 1991; Marsh & Hau, 2003; Marsh, Seaton, et al., 2008; Marsh, Trautwein, Lüdtke, & Köller, 2008).

That the development of a healthy self-concept may be undermined for some students who are educated in academically selective contexts is of critical concern,

given that a positive self-concept is seen as an important outcome of schooling (Organisation for Economic Cooperation and Development, 2003). Indeed, one of the principal values attached to education in Australia is that it “is as much about building character as it is about equipping students with specific skills”, and that schools should nurture in students “qualities of self-confidence, optimism, high self-esteem, and a commitment to personal excellence” (Ministerial Council on Education, Employment, Training, and Youth Affairs, 1999, p. 1). Furthermore, research has shown that a positive academic self-concept is linked to vital educational outcomes, such as academic attainment, coursework selection, and educational and career aspirations (e.g., Craven & Marsh, 2008; Guay, Larose, & Boivin, 2004; Guay, Marsh, & Boivin, 2003; Marsh, 2007b; Marsh & Craven, 2006; Nagy, Trautwein, Baumert, Köller, & Garrett, 2006).

Most importantly, academic self-concept and academic achievement have been demonstrated to share a reciprocal causal relation, referred to in the literature as the reciprocal effects model (REM; Marsh, 2007b; Marsh & Craven, 2006). REM research has shown that prior academic self-concept is associated with future improvements in academic achievement, and prior academic achievement reinforces subsequent academic self-concept (Guay et al., 2003; Marsh & O’Mara, 2008; Marsh, Trautwein, Lüdtke, Köller, & Baumert, 2005; Seaton, Parker, Marsh, Craven, & Yeung, 2014; Valentine, Dubois, & Cooper, 2004). If attending academically segregated schools lowers some students’ academic self-concepts, as BFLPE research indicates, then it is likely that some students in selective schools will have lower academic self-concepts than many students of a similar achievement level in comprehensive schools. Hence, some of our nation’s high achievers may not be reaching their full potential in terms of their academic success and in their development of a healthy self-concept.

To date, these issues have not been examined in relation to selective schools in Australia, and in NSW more specifically. Despite the prolific nature of BFLPE research, most of the research support for the effect comes from international studies, while those that have been conducted within Australia are dated, or focus only on primary school students in gifted and talented (GAT) programs (e.g., Craven et al., 2000). Thus, there is a need to examine how the high achievement context of academically selective schools impacts the academic self-concepts of its students,

and furthermore, how the effects are similar or different to those experienced by students located in mixed-achievement comprehensive schools.

Additionally, although the REM has been extensively supported in a myriad of research settings, there is currently a gap in the literature in that the operation of this process from a GAT context has not been examined. Specifically, it is not known whether the REM is present in, and equivalent for, high achieving students who attend academically selective schools, for high achievers who attend comprehensive schools, and lower achievement students who attend comprehensive high schools. If the selective school environment does operate to weaken some students' perceptions of their capabilities (as in the BFLPE), and these lowered perceptions are likely to undermine future academic success (as in the REM), then the extent to which differing educational contexts promote or inhibit the development of a positive self-concept is of immense theoretical and practical importance. It is the goal of the present investigation to examine these issues via quantitative and qualitative methodologies, in order to ensure that not only the academic success but also, critically, the development of a healthy self-concept, is being nurtured in those students in selective educational settings.

Beyond the BFLPE and REM research, and its implications for academic self-concept, there has been limited research specifically evaluating the Australian selective school model. As Robinson (2006) highlights "we really have very few well-controlled investigations pitting one approach against another or even one approach against business as usual" (p. 342). In relation to the small body of research that does exist, there are concerns regarding the theoretical, methodological, and conceptual soundness of studies that, to date, have led to mixed findings and ultimately have hampered contributions to the debate. The criticisms principally relate to: the lack of inclusion of appropriate groups for comparison; a failure to account for pre-existing differences between students, such as levels of academic achievement; and the almost exclusive focus on achievement outcomes, where limited consideration is given to socio-emotional outcomes (e.g., Braithwaite & Kensell, 1995; Chan, 1996; Gross, 1997; Jones, 1955; Sampson, 1969; 1977). These factors, together with the datedness of the research, which has limited applicability to the students of today and cannot capitalise on the many advances in research methodology since then, have made it difficult to draw sound conclusions from the paucity of research conducted.

Alongside the existing research, numerous reports commissioned by the NSW Government (the Knibbs-Turner Report [1906], Wyndham Report [1957], Macdonald Report [1977], and Vinson Report [2002]), have each called into question the legitimacy of the selective school model, principally based on the lack of systematic evaluation of the relative advantages and disadvantages of these schools for the students who attend them. However, the conclusions emanating from these inquiries have, for the most part, been ignored. Indeed, the landmark Vinson Report (2002), the most recent and far-reaching public inquiry into education in NSW in the last 50 years, recommended a moratorium on new selective high schools and the de-establishment of existing ones—recommendations that were, nevertheless, not endorsed by the NSW Government. The Report concluded that:

Unfortunately, there are no recent comparison data available in New South Wales concerning the relative performances of high ability students in selective versus comprehensive high schools. The Inquiry accepts that these data might be sensitive, but would like to see them made public to contribute to this important debate. (Vinson, 2002, p. 19)

Until now, this call for research to inform critical educational policy and practice has remained largely unanswered. The provision of academically selective schools may be the optimal educational policy for high achievers, but clearly there is an absence of evidence to support this argument. Given that there are currently 21 fully selective schools and 25 partially selective schools with academically selective streams in NSW, and with these numbers set to increase in the future, it is problematic that such an educational policy with such far-reaching implications has not been conclusively evaluated.

Specifically, there is little research that has examined: (a) the tangible impact of different types of educational provision on students' academic achievement and psychosocial outcomes; (b) the factors that serve to enhance or impede the psychosocial wellbeing and academic attainments of high achievers, and how these may vary across diverse educational settings and achievement levels; (c) how the unique cultural heritage composition of the school and the student body may also be an influential element woven into the fabric of students' school lives; and (d) students' first-hand perceptions and experiences of differing academic milieu.

Given that the selective school issue in NSW has remained unresolved amongst governments, policy makers, academics, educators, and parents for many

decades, it is the overarching aim of the present investigation to contribute empirical evidence to advance measurement, theory, research, and practice in this area. The current study attempts to overcome some of the methodological limitations identified in the existing literature by: employing a rigorous and contemporary mixed-method research approach; comparing appropriate groups of students across diverse school settings; controlling for student differences in terms of academic achievement, SES, and cultural background; and assessing a range of important biopsychosocial outcomes beyond academic achievement that are integral for school success. Hence, the present investigation will contribute substantial research integrity to the study of this educational issue.

The current investigation employed a synergistic mixed methods research design that capitalised on the strengths of both quantitative and qualitative approaches, studying students at two time points throughout the school year. The central aims of the present investigation were to: (a) examine the differential impact of the contrasting achievement contexts generated by academically selective and mixed-achievement comprehensive schools, on students' academic achievement; (b) investigate the relative positive and negative effects of selective and comprehensive schools on a range of important student wellbeing outcomes, including: academic self-concept, academic buoyancy, relations with parents, pressure to achieve from parents and teachers, and depressive and anxious tendencies; (c) elucidate the cause and effect relations between student wellbeing variables and academic achievement across time, and whether they are similar or different across school settings; (d) uncover whether and how students' cultural heritage may differentially impact their academic achievement and psychosocial wellbeing, and whether these relations are consistent for all students (as driven by the qualitative findings); and (e) identify nuanced understandings of students' direct experiences and perceptions of their schooling contexts.

In seeking to do this, it is anticipated that the findings will have the potential to: expand current BFLPE and REM research; cultivate and extend research on academic selectivity in NSW via systematic evaluation of a range of student outcomes; generate new knowledge and identify applied implications that are fundamental to advancing educational policy and practice; and make a timely and valuable contribution to advancing current theory and research. In order to achieve these aims, three interrelated studies were conducted. Study 1 quantitatively

examined the psychometric properties of the quantitative instrumentation, including reliability, construct validity, and invariance across sub-groups (gender, year level, and school setting/achievement level). Study 2 quantitatively investigated the differential impact of diverse school settings on student achievement and psychosocial wellbeing. Additionally, the relations between psychosocial factors and achievement were assessed to uncover the drivers of student success at school, and the role played by diverse cultural backgrounds in predicting academic achievement and wellbeing was examined. Study 3 capitalised on in-depth focus group interviews with students purposefully selected on the basis of their high academic achievement and differing levels of academic self-concept (high, low) from the selective school and one comprehensive school, to further explicate the goals of Study 2, and to uncover the mechanisms underlying the quantitative findings.

This thesis comprises 10 chapters. Following the current introductory chapter, Chapter 2 presents a literature review that traverses the long and complex history of selective schools within NSW, considers the various discourses and value positions that surround the segregation debate, and reviews the opposing arguments related to these schools, in order to develop the rationale for the present investigation. Chapter 3 provides a review of the literature regarding the BFLPE, the REM, recent research that has evaluated the selective school model, and the rationale for the inclusion of the various psychosocial outcomes, so as to bring together a clear understanding of the need for the current study. Chapter 4 outlines the specific aims, hypotheses, and research questions that served to guide the research. Chapter 5 summarises the quantitative and qualitative procedures, the rationales and the methodologies utilised to achieve the study's aims. Chapter 6 presents the findings pertaining to the psychometric assessment of all instruments. Chapter 7 outlines the main quantitative results, evaluating the impact of different school settings on a number of educational and psychosocial outcomes, the psychosocial determinants that serve to underpin students' academic achievement and their similarity across the settings, and the varying impact of cultural heritage on students' academic and wellbeing outcomes. Chapter 8 examines the qualitative interview findings, presenting each of the significant themes emerging from the data analysis. Chapter 9 presents a comprehensive discussion and interpretation of the findings presented in the previous three chapters, and identifies suggestions for future avenues of research. Finally, Chapter 10 provides a conclusion and summary of the key findings.

CHAPTER 2 THE BIG PICTURE: THE VALUE STRANDS, THE CONTROVERSY, AND THE HISTORY OF NSW SELECTIVE SCHOOLS

I wouldn't think of selective schools as separate schools. There is the Conservatorium of Music, which is a school for children who have towered in music and the performing arts. We don't talk about that as if it is segregation, because we accept that for kids who have got certain types of talent they may need to have a special education. In New South Wales we've also got schools for kids who have talent in sport and in athletics and we don't worry too much about the separateness of schooling for that, so why shouldn't we have schools for kids who've got particular aptitudes in what's extremely serious: maths, English, science, languages? That doesn't worry me; I don't think of it as separate education. I think of it as special education with a curriculum designed for kids who differ in a particular way. For gifted kids that means faster learning and learning at a higher level of complexity.

Miraca Gross, Director of the Gifted Education Research,
Resource and Information Centre (GERRIC; 2011, para. 21)

The other factor with which I have concern is the ready acceptance by the advocates for "giftedness" that separation of these students is socially and intellectually defensible. I don't mean separation for programs, extras, advanced courses etc.—I mean full bottle separation, physical, physical separation from one's age cohort. I find it utterly amazing that in a context which is very strong on the integration of the disabled, we find no sensible public debate on the segregation of the "abled". To me selective high schools are an abomination, with a poor educational record—an Industrial Society answer to a post-Industrial problem.

Ray Cavanagh, Deputy President of the NSW Teachers
Federation (1994, p. 1)

Introduction

Although it is well over a century since the establishment of the first academically selective government high schools in NSW, the epigraphs above serve to highlight that the relative merits of the selective and non-selective comprehensive school models continue to attract vigorous comment and debate amongst teachers, parents, academics, educational administrators, and policy makers. Despite the ever-present prominence of the controversy surrounding the selective school issue in political and media discussions, there has been a continued rise and substantial growth in these schools and selective classes within NSW in recent years. It is the purpose of this chapter to provide the rationale and impetus for the current research by disentangling the complex history and evolution of academic selectivity, which is bound by widely held assumptions, philosophical reasoning, hardened value positions, and social and political considerations, as opposed to rigorous research findings that support the merits of this educational policy.

There are five sections in this review. The first section provides a brief orientation to the terminology used in the present investigation. Next, the origins and evolution of academic selective schools within NSW are traced by reviewing the competing theoretical value strands that underlie the debate about selective schooling. The third section progresses to a discussion of the opposing arguments on the legitimacy of these schools. This is then followed by an extensive analysis of the complex and varied history of the policies and practices that have shaped academic selectivity within NSW. The final section of the chapter weaves together each of these elements, culminating in the implications for the present investigation.

Addressing the Terminology

As with the topic of selective schooling itself, there is considerable controversy surrounding the discourse involved in the GAT literature. This controversy includes a number of issues. First, there is the issue of the value-laden terminology used to describe students who achieve to a high standard: terms such as “gifted”, “gifted and talented”, and “high-ability”. A second issue is how giftedness or talent is defined, and the criteria used to measure and identify such students. Finally, there are issues with respect to the domains across which the concept of giftedness occurs, such as academia, sport, music, and art. Consequently, the terms

of reference within this thesis must be made clear at the outset, given that it is best practice to use terms that have a clear meaning, as far as possible.

The present research is based on a cohort of students from NSW secondary schools. The government body responsible for these schools defines GAT students broadly as those who possess “high academic ability” (NSW Department of Education and Training, 2004). More specifically, the NSW Government policy utilises definitions based on Gagné’s (2003) differentiated model of giftedness and talent (DMGT), which is applied to students who exhibit above average potential and superior performance in one or more domains of human endeavour. The students within the present investigation were operationally referred to as high academic achievers within the areas of Mathematics and English. In the context of this research, the selective school students are the top academic performers within the state of NSW on formal, state-wide academic tests (NSW Department of Education and Communities, 2013b). The high achievers within the comprehensive school setting were selected based on the distribution of the selective school students’ scores on the standardised Mathematics and English achievement tests at Time 1.

Having established the terms of reference, the chapter now turns to the philosophical positions that inform the debate on selective schooling.

Value Strands at the Heart of the Debate on Selective Education

Policy decisions continue to be affected by the ongoing debate concerning the perceived incompatibility of the concepts of equity, excellence, and differentiated programs

(Frydenberg & O’Mullane, 2000, p. 79).

The competing philosophical value strands of individualism and communitarianism as lenses through which to view education, have resulted in battlelines being drawn up in the politics and the public debate surrounding the education of high achieving students broadly, and the issue of selective schooling more specifically (O’Brien & Vialle, 2002; Peters & Marshall, 1996; Tomlinson, 2008). For more than a century, and deepening in the past 20 years, the primacy of individual liberty and achievement—the philosophy of individualism—has stood at odds with a belief in the significance of the community and of shared achievement—the philosophy of communitarianism—in the argument about how best to encourage the welfare of society (Glass & Rud, 2012).

This debate between private and public good has had, and will continue to have, profound implications for public institutions of all types, especially the education system. A focus on individualism emphasises a freedom from intrusion by any organisation, including the government, in an individual's pursuit of his or her own goals (Glass & Rud, 2012; Peters & Marshall, 1996). The philosophy of communitarianism argues against an emphasis on the individual rights, with the idea that people do not live in a vacuum, and so the values of community and social responsibility are vital to balance the scales against self-centredness and individual power (Glass & Rud, 2012; Peters & Marshall, 1996). These opposing worldviews are no more apparent than when social and educational policy is deliberated.

In arguments about the need for and legitimacy of selective schools, this debate tends to centre on the emotional and philosophical issues of segregation, elitism, egalitarianism, and the provision of opportunities to achieve individual student potential (O'Brien & Vialle, 2002). Questions then arise as to whether it best serves GAT students, as well as the wider student population, to educate students of differing backgrounds and levels of achievement together in local comprehensive high schools, or whether the gains of selective schooling are too great to ignore

Furthermore, it is asked whether the number of selective schools should continue to rise as they have in NSW over the past 30 years, or if their existence should be called into question. Often, the debate about selective schools is collapsed into reductive arguments about the collision between social justice and individual achievement. Broadly speaking, those who support the selective school model for best educating high achievers put forth a primarily individualist perspective, which views the school's role as predominantly focused on the cultivation of measurable individual academic attainment and excellence (Glass & Rud, 2012; Vinson, 2002).

Those who are against the selective school model generally espouse a communitarian perspective, which voices a preference for schools to act primarily as forces of social cohesion and democracy, whereby mutual understanding and socially just educational outcomes are fostered amongst students of different cultural, academic, and socioeconomic backgrounds (Glass & Rud, 2012; Vinson, 2002). The contention about the issue of selective schooling centres upon the fact that much is based on "hardened value positions that pay little heed to varying circumstances or empirical evidence" (Vinson, 2002, p. 2). Indeed, what has tended to emerge is that there has been little room for a more measured, bilateral value perspective,

emphasising equitable academic achievement within a framework of social cohesion.

Also underscoring these issues with selective schooling is a second set of value considerations. Since the late 1980s, neo-classical economic theory or economic rationalism has been a significant driver of politics and public administration in Australia, alongside the practice of corporate managerialism, whereby private sector management methods are utilised for public sector initiatives (Marginson, 1997; Vinson, 2002). Within this neo-liberal movement, education is viewed as an investment in the creation of individual human capital, and the output producer of economic growth (Marginson, 1997; Tomlinson, 2008). Consequently, the ideas of competition, choice, diversity, productivity, accountability, performance indicators, deregulation, and privatisation have significantly permeated state education policy within NSW (Dwyer, 1998; Vinson, 2002).

This market orientation towards the provision of education, arguably, has led to the rapid expansion of academically selective schools in NSW, following the introduction of the 1990 Education Act (Reid, 1998). This Act is discussed in greater depth later in this chapter. Essentially, the application of economic considerations in education has served to establish increased competition, specialisation, and differentiation between schools, to preserve the primacy of parental choice in education, and to increase the measurability of outcomes and ensure schools are subject to the same efficiency and accountability standards as private enterprise (Vinson, 2002).

This economic ideology, and the academic excellence versus social cohesion value strands outlined above, are traversed by the opinions commonly espoused by parents, teachers, schools, and key education stakeholders in support of or against academically selective schools. It is these varying positions, not necessarily grounded in supportive research evidence, to which this chapter now turns.

The Debate on Selective Schools

The argument over whether selective schools should exist is longstanding and highly polarised

(Senate Employment, Workplace Relations, Small Business and Education References Committee, 2001, p. 7).

There is a multitude of opposing viewpoints regarding the value and appropriateness of selective schools for best meeting the educational needs of high

achieving students. What emerges from an analysis of the various arguments in favour of and against selective schooling, is that there are widely held assumptions that have become central to this debate. Each of these is now discussed in turn.

Arguments in Favour of Selective Schools

The arguments put forth in support of academically selective schools tend to cover three broad areas. The first regards the need to group high achieving students within specialist schools; the second focuses on improved outcomes for students; and the third centres upon equity issues. The first of these positions centres upon the belief that high academic achievers need to be educated together with other “like minds”, in order to achieve to their fullest potential (Vinson, 2002). The proponents of selectivity maintain that this model of education provides, in the most effective way possible, an opportunity for high achieving students to access the specific type of educational environment they need in order to perform at their best (O’Brien & Vialle, 2002). The environment within comprehensive schools is criticised as being insufficiently challenging, as having an “alleged trend toward educational mediocrity” (Macdonald, 1977, p. 46). It is argued that selective schools provide an appropriately challenging and stimulating environment by “grouping talented students together, concentrating school resources and using specialised teaching methods” (NSW Department of Education and Communities, 2006, para. 3.5).

Closely linked to the first position, the second set of arguments in support of academic segregation states that the selective environment positively heightens and value-adds to the already high performance of the students who attend them (Vinson, 2002). The apparent advantages of academic segregation are highlighted each year, when the final year Higher School Certificate (HSC) results of NSW students are published in the newspaper, showing that several of the selective schools outperform nearly all of the other public and private schools. Support for this argument is again linked to the greater homogeneity of groupings that these schools provide, both in the school as a whole and within separate class groups (Dixon & Gow, 1993). It is frequently supposed that a reduction in the range of learning-related differences within a group facilitates both teaching and learning, although the reasons given for this relation are diverse and are not necessarily based upon research findings (Craven et al., 2000).

The assumption made is that greater homogeneity in achievement levels enables instruction to be directed towards the group as a whole, making teaching

more manageable so that targeted and individualised instruction can be given. Thus, the reasoning is that the academic performance of the students who experience this environment is raised, and they presumably gain better outcomes than they could have at their local comprehensive school (Dwyer, 1998). However, these results are not surprising, given the high achievement levels of the students within selective schools to begin with.

Finally, the third main viewpoint in favour of selective schools is that they provide a free, high-quality education for GAT students based on merit, that does not discriminate on the basis of gender, cultural background, or socioeconomic status (Vinson, 2002). It is argued that high achieving students have the right to an education that effectively meets their needs; selective schools are said to provide a public alternative to expensive private schools (Dwyer, 1998).

Arguments Against Selective Schools

The arguments that question the effectiveness of selective schooling are based on five broad grounds. The first concerns the absence of well-established research findings supporting their effectiveness; the second highlights the negative effects on self-concept; the third considers the practical impact on local schools; the fourth regards issues of equity; and the final argument questions the process of student selection.

In the first of these points, it is highlighted that there is a lack of solid, research-based evidence to support the commonly proposed argument that selective learning environments do enhance the prospects of high achievers over and above the prospects of those in the comprehensive school setting (Craven et al., 2000; Vinson, 2002). Those who do not support the selective system support investment in the comprehensive school system via curriculum development, increased staffing, specialised teacher education and training, the introduction of a wider range of courses, of extension and enrichment programs, and question the notion that GAT students should only mix with others of a similar achievement level in order to attain their best (O'Brien & Vialle, 2002). Moreover, detractors highlight that the teachers in selective schools are not specially selected for their positions; rather, they possess the same level of qualifications as those who teach within the comprehensive school system (Senate Employment, Workplace Relations, Small Business and Education References Committee, 2001).

The second main position against academic selectivity surrounds the effect of

such an intense learning environment on the academic self-concept of the students who attend them (Vinson, 2002). An extensive body of research based on what is termed the big-fish-little-pond effect (BFLPE) has supported this claim: it is consistently found that students in high-achievement schools have lower perceptions of their academic capabilities than do their equally able counterparts in low- and mixed-achievement settings (Craven et al., 2000; Marsh & Hau, 2003; Marsh, Trautwein, et al., 2008). This is important, considering that research has also demonstrated that a positive self-concept is vital in a multitude of domains (e.g., Marsh & Perry, 2005), is a critical goal of education (Ministerial Council on Education, Employment, Training and Youth Affairs, 2008), and is a driving force in generating the most ideal educational outcomes (Guay et al., 2004; Marsh & Yeung, 1997b). The BFLPE is discussed in much greater detail in Chapter 3.

The third argument against selective schooling concerns the negative impact of such schools on the local comprehensive high schools (Vinson, 2002). The guardians of the comprehensive system have described the exodus of high achieving students from this model to the selective school model as “skimming the cream off the top” (O’Brien & Vialle, 2002, p. 42). It is claimed that the selective schools attract the brightest students and that this has led to the “ghettoisation” of comprehensive schools in their vicinity (Senate Employment, Workplace Relations, Small Business and Education References Committee, 2001, p. 63). Those who are opposed to academic selectivity argue that this situation is divisive for the community, detrimental to the children excluded in this selectivity, creates unrepresentative and segregated student populations, and encourages unrealistic educational and social environments that are detrimental to all students’ global education, to school morale, and to the larger society in general (O’Brien & Vialle, 2002).

The fourth argument, concerning the place of selective schools in the educational landscape, addresses the supposed equity in the accessibility of places for all students, irrespective of social background. Specifically, critics of the selective model highlight the school demographic data, which indicates that selective policies tend to benefit the upper-socioeconomic groups (Rothman, 2003; Tomlinson, 2008). Data from the Australian Government’s My School website that compiles contextual information about all NSW schools shows that children whose parents are from higher social and educational backgrounds are over-represented in

selective schools, while those from disadvantaged backgrounds are significantly under-represented (Bonnor, 2011). It is argued that rather than expanding opportunities for all students across the social spectrum, selective schools tend to intensify social gaps and to promote social inequality (Lamb, 2008).

The final broad position against academic selectivity encompasses several concerns regarding the one-off allocation of students into these schools at the end of primary school via the Selective Schools Test (Vinson, 2002). The first of these relates to the nature of giftedness being assessed via this test, which assumes that the capacities being measured are innate, set, and unchangeable. Moreover, the influences of coaching for the test, and practice effects, are said to raise social justice issues, and to call into question the notion that all of the students selected are so highly academically talented that they require a segregated environment in order to achieve well (Vinson, 2002). Lastly, concerns are raised regarding the idea that academic achievement is the only method used to allocate students to a different educational environment, in an all or nothing manner, without consideration of other affective variables (Vinson, 2002).

The foregoing discussion, tracing the course of selective schooling, has presented an overview of the ideological value strands and the opposing positions that go to the heart of the selective school debate. These elements have underpinned the intricate history of selective school policy and practices in NSW. The next section of this thesis now presents this multilayered history.

Selective Schooling in NSW: An Historical Background

The history of gifted education in Australia has taken many paths that have been influenced by successive government policies and practices

(Frydenberg & O'Mullane, 2000, p. 78).

The conception and establishment of academically selective high schools within NSW has a long and complex history. When one follows their trajectory within the education system, it is clear that the rationale for selective schooling is entrenched in deep tradition and social value rather than in solid research evidence as to its effectiveness in educating high achievers. Furthermore, that there is deep controversy surrounding the topic of selective schooling is clear, as is the vital role played by emotional discourse and anecdotal experience in shaping such an important educational policy. What emerges from the following comprehensive

historical perspective is a clear rationale for the present research, which aims to redress this lack of empirical research examining the impact of the selective environment.

The Foundation of Selective Schools, 1880

In 1880, The Public Instruction Act marked a significant milestone in the state's entry into the field of public secondary education. By 1883 the first separate secondary schools for boys and girls in Bathurst, Goulburn, and Sydney were established (Macdonald, 1977; NSW Department of Education and Communities, 2013a). From their inception, these high schools, which were based on the British model, were intended specifically for students who desired to attend university and could afford the relatively expensive school fees (Braggett, 1985). Moreover, selective entrance to these schools was via a competitive academic examination, thus establishing in NSW the first secondary schools that grouped together highly achieving students on the basis of their academic attainments (Braggett, 1985). Selective schools were thus born as an educational response to the nature of society at the time.

However, these schools were heavily criticised as inadequate and insignificant, providing only “for an elite of scholastic ability and interest, and . . . generally too far removed from the predominantly vocational interests of the general population” (Macdonald, 1977, p. 7). Braggett (1985) notes that due to this discrepancy between the academically selective education being offered as a result of the 1880 Act, and the reality of the wider student community's needs and aspirations at the time, parents often chose to send their children to the Superior Public Schools, which combined primary and secondary education. Here, fees were nominal and students were offered some secondary education and the potential for success in the Junior, Senior and Public Service Examinations (Braggett, 1985; Macdonald, 1977). Attesting to this the fact, in any year prior to 1910, enrolments in the selective high schools never exceeded 1,000 students (NSW Department of Education and Communities, 2013a). By 1911, a major change in the nature of public secondary education would occur.

A Two-Tiered System of Education, 1911

The Knibbs-Turner Report, based on a comprehensive review of education in the state, intensely criticised the inadequacies of secondary school provision of the time (Macdonald, 1977). Alongside this report, Peter Board, the then Director of

Education in NSW since 1905, held a strikingly different philosophy regarding the provision of high school education than that espoused in 1880 (Braggett, 1985). Board believed that all students had the right to a secondary education, and that schools should serve to prepare all adolescents “for a responsible citizenship” (Whiteman, 1973, p. 3). Secondary education began to evolve from an initial provision for the very few with high academic standards and financial support, towards free, compulsory, and secular provision for all adolescents (Frydenberg & O’Mullane, 2000; Macdonald, 1977).

This burgeoning egalitarian perspective led to the establishment of a dual framework, or two-tiered system of secondary education, to cater for the differing academic levels and goals of the whole student community, where academic endeavours were pursued in high schools, and vocational endeavours such as trade, industry, and agriculture were offered in technical schools (Braggett, 1985). Board had desired that all high schools would hold equivalent status; however, the academic schools to which entry was gained through a highly competitive qualifying examination attained considerably greater status than the vocationally oriented secondary schools and Superior Public Schools, which provided limited secondary education (Braggett, 1985). Whiteman (1973) explains that what now emerged was an environment where students attending the selective schools were considered the social and academic elite, with their prestige firmly cemented solely in their academic performance, rather than in the former criteria of performance *and* ability to pay expensive school fees. “It was ironic, therefore, that the egalitarian push to extend secondary education in Australia accentuated the importance of academic high schools and gave status to the children attending them” (Braggett, 1985, p. 17).

Additionally, with the dawn of tests of intelligence developed by Binet and Terman in the early 1900s, the capacity to identify students on the basis of their academic capabilities, and the subsequent educational opportunities for grouping students on the basis of such identification, became apparent (Braggett, 1985; Robinson, 1992). In 1924, the then Directors of Education in all of the Australian states, in consideration of these pioneering developments, met and established that it “would be sound educational policy to gather together children of mental ability much above the average and to educate them in special classes where their talent might have a better chance of full development” (Tasmanian Archives, 1924, as cited in Braggett, 1985, p. 11).

NSW commenced grouping students who excelled academically together in “Opportunity Classes” at the primary school level (Frydenberg & O’Mullane, 2000). The Directors of Education believed that regular, mixed-achievement classrooms were inadequate, as the “supernormal child often finds the class work so simple that there is not sufficient call upon him [sic] for mental effort”, resulting in atrophying of ability, and “habits of laziness” (Tasmanian Archives 1924, as cited in Braggett, p. 11). Thus, NSW public schooling at this time was structured so that ability segregation was represented via academically selective secondary schools and ability grouping in comprehensive schools (Robinson, 1992). This practice coincided with those of many countries around the world, where segregation was advocated as an effective educational strategy to provide for different achievement levels (Ireson & Hallam, 2001).

Evidentiary support for such claims that selective schooling is an educational method that enhances the outcomes of high academic achievers was, however, largely absent. It is apparent that from their establishment, and throughout the first 50 years of their existence, selective schools faced no evaluation of their impact on those students attending them. This relative lack of empirical evaluation comparing the effects of differing schooling settings on the achievement and wellbeing of students remains an issue that has been unresolved since the inception of selective schools within NSW. Hence, it is a key goal of the present investigation to contribute to the development of research that evaluates differing educational provisions for high achieving students.

The Comprehensive School System, 1961

In the following decades, the nature of education in NSW would undergo further critical broadening, where the focus shifted to providing an education for a wider range of academic levels, based on a similarity of social factors, rather than on similarity of attainment (Braggett, 1985; Frydenberg & O’Mullane, 2000). The provision of public secondary education was changing radically, from being considered the privilege of the social and academic elites, to one that was equal and open to adolescents of all backgrounds and achievement levels. The rising post-war birth rate, alongside the immigration boom and increased school retention rates, was putting increasing social pressure on the secondary education system to provide for a wider array of students (Frydenberg & O’Mullane, 2000).

A landmark review of the NSW secondary education system in 1957, known as the Wyndham Report, gave rise to the establishment of co-educational comprehensive high schools throughout the state by 1961 (Macdonald, 1977). This reorganisation of the provision of secondary education rejected the notion that post-primary education should only be geared towards students seeking university entrance: “The crux of the new scheme was that educational provisions should be adapted to the multifarious needs of the whole adolescent group, and should assist in the social development of all young people” (Macdonald, 1977, p. 9). As such, all students who completed primary school were to be accepted into secondary school, regardless of their academic achievement levels, and without prerequisite testing (Wyndham, 1957).

The new comprehensive schools were located in the local community in which students resided, and would cover the same group of fundamental subjects (Macdonald, 1977). The curriculum was to be geared toward “the level of pupils of average ability” (Braggett, 1985, p. 298), to widen the scope of secondary education to all planes of interest and all capabilities within the changing social context. The Wyndham report did not ignore high academic achievers however, and outlined that such students should be nurtured via special provision of a scheme of electives within the comprehensive school network, as “no community can afford . . . to lose sight of the need for identifying and cultivating talent of every kind” (Wyndham, 1957, p. 66).

The landscape of secondary education had been transformed with the advent of a new concept, of public comprehensive secondary schooling throughout NSW; however, academically selective schools were at odds with this new educational stance, and their position was undermined: “a process which had already begun but which was now accelerated” (Braggett, 1985, p. 257). The “educational validity” of the selective schools was being questioned by some of the public, by groups of teachers, and the Department of Education itself (Macdonald, 1977). However, academically selective schools remained.

Braggett (1985) has explained how socially powerful supporters of the selective high schools began speaking of great fears of falling standards of education, and denounced the proposed closing of these schools, which possessed such fine traditions and a history of upholding academic standards. Selective school supporters began lobbying the government, and created enough pressure and controversy for the

Department of Education to amend its official policy and undertake to preserve the existing selective schools within the framework of comprehensive schooling (Barcan, 1980). The then Minister for Education, E. J. Wetherall, justified this decision in that the location of these selective schools in central Sydney made it “wellnigh impossible” to consider them as local community schools; further, they had a “long established history which no sensible person would wish to ignore” (Macdonald, 1977, p. 11). Once again, any reference to solid empirical evidence as to the benefits of these schools was absent from the rationale for retaining them.

However, further problems were on the horizon for academically selective high schools, arising from their proximity to the local schools (Braggett, 1985). Essentially, the issue centred upon the need to maintain a balance between equitable entry standards for the local comprehensive schools and, simultaneously, the academic selectivity of the older selective high schools (Braggett, 1985). The Department of Education attempted to resolve this problem in 1962 by placing enrolment restrictions upon the selective high schools, whereby students could only be drawn from a specific, predetermined geographical zone, and an adjoining area from which up to 20 percent of students could be selected on a stringently competitive basis (Macdonald, 1977).

As a result of these enrolment restrictions, a number of significant issues in relation to selective schools emerged by 1974. Those with a professional and vested interest in the maintenance of selective schools were becoming increasingly unhappy with the altered state of their academic environment. The 12 selective high schools in operation in NSW at this time now had many vacancies, even though all students meeting the minimal requirements for entry, who were located within the feeder area and desired entry to the school, had been enrolled (Macdonald, 1977; Braggett, 1985). Furthermore, the principals of the selective schools claimed that the altered intake conditions had meant that the schools were not enrolling students of the same high academic standard as they once were, so that “the traditional aspirations for the school, because of its selective nature, may not now be achieved” (Macdonald, 1977, p. 1). Additionally, the School Council and the Parents and Citizens Association of Sydney Boys High, worried that the schools should uphold their standing within the community, called for the enrolment area to be widened, “for there was concern that in future years there may not be sufficient pupils in the local area to meet the school’s academic standards” (Macdonald, p. 1).

At the same time however, staff and parents from the comprehensive schools within the selective school feeder areas, and the NSW Teacher's Federation, with its enduring and well-known opposition to selective schools, were also generating community pressure to bring an end to selective high schools (Braggett, 1985). The opposing attitudes regarding these schools within the community highlighted the chaotic and continually fluctuating policy of selectivity (Macdonald, 1977). The Department of Education was at a major crossroads in the history of academically selective schooling in NSW:

It was realised that the retention of this small group of schools was based on administrative, social and political considerations that ran counter to the philosophy espoused by the Department of Education and that the situation was aggravated by the changing demographic patterns of the feeder areas in which the schools were located. (Braggett, 1985, p. 258)

Moreover, the policy of identifying and delivering special provisions for high achievers within the comprehensive schools, had also suffered from the post-war population boom. The sheer number of students, alongside the diverse levels of academic achievement and the social, cultural, and demographic characteristics that emerged from the student community at the time, redirected the educational focus toward students experiencing disadvantage (Frydenberg & O'Mullane, 2000). The Australian Directors of Education felt that the country now lagged behind others in its concern for GAT educational provision, and that these students' needs had been abandoned and even rebuffed, in light of the focus on social reform (Braggett, 1985). Thus, in 1975, the then NSW Minister for Education established a committee, led by C. L. Macdonald, to once more examine, report, and make recommendations on the place of selective high schools within the system of comprehensive education, and the wider issue of appropriate educational provision for high academic achievers.

The Macdonald Report, 1977

It has to be admitted that a number of educational practices are at present accepted on the grounds that they should be effective rather than a conviction that stems from rigorous research

(Braggett, 1985, p. 322).

The 17 month long enquiry that informed the final report from Macdonald in 1977, considered 250 submissions from teachers, parents, pupils, academics, and community stakeholders. The committee reported extensive community interest in the topic of selective schooling, and ultimately found that their task of reviewing the

suitability of selective schooling was exceptionally complex, due to the multitude of opinions, understandings, and discussion of the problems involved; hence, the future actions required for educating high achievers were “clouded by emotional reactions” (Macdonald, 1977, p. 2). The report found that the overwhelming majority of educators were not in favour of selective schools, but rather, espoused special provisions within the comprehensive school system. Moreover, “the theoretical rationale for selective schools had not generally been specified in detail in the research literature” (Sampson, 1977, p. 113). Recognising the emotional nature of discourses about, and the lack of sound empirical research into, justification for academically selective high schools, the committee commissioned an immediate empirical investigation comparing the secondary school academic performance of pupils in selective and comprehensive high schools (Macdonald, 1977).

In the first research of its kind, Sampson (1977) obtained a sample of 240 students from eight selective schools in 1969, and matched them with 240 students from closely located comprehensive schools on gender, age, ratings of social status, level of IQ, and a primary school coordinated achievement mark, comprising a combination of IQ score and results in English and Mathematics. The study aimed to determine whether the type of school attended affected the academic achievement of GAT students. Academic achievement was measured via School Certificate and HSC marks, from the formal, nation-wide tests undertaken by all NSW students in Years 10 and 12 of school respectively. In terms of School Certificate examination grades, Sampson reported that an analysis of variance found no significant differences between the selective and comprehensive groups of students. Furthermore, analysis of variance revealed that there were no significant differences between selective and comprehensive students in terms of HSC examination marks. Essentially, the high achieving students performed as well as each other on both academic examinations, irrespective of their educational environment.

A potential criticism of and explanation for these findings arose, in that the selective high schools now had a quantitatively lower academic standard than in previous years following the recently implemented admission restrictions. Specifically, Sampson (1977) considered that it could be argued that the selective schools were not sufficiently selective at the time the research was carried out, and that better academic results for these schools would have been obtained in the years prior to the enrolment restrictions. In order to test this possibility, Sampson

compared data on the primary school coordinated marks of the selective school cohort from his 1969 study with that of 1960. It was found that the variance in means was small, non-significant, and represented only .5 points of variance in IQ, leading Sampson to conclude that the difference would not meaningfully alter the findings. Empirical research had not supported the efficacy of academically selective schools for educating high achieving students in terms of their achievement outcomes. These research findings led Macdonald (1977) to conclude that this research supported the notion that “special ability grouping, of itself, is of limited value in realising the potential of the talented” (p. 69). Sampson also advocated further research to investigate the impact of the varied educational settings on the affective wellbeing of students.

Concurrently, “the Committee had maintained a number of serious reservations about the educational relevance of selective high schools and took the view that, in their present form, they were not meeting the needs of talented children” (Macdonald, 1977, p. 69). Such reservations had stemmed from concerns related to some key factors: although there was special selection of students for these schools, there was no special selection of teachers; the belief that not all of the student cohort could be considered talented; the geographic areas which the schools served were too narrow; and many high academic achievers were being pulled away from the local comprehensive schools. These concerns, cemented by the findings of Sampson (1977), led the final Macdonald Report to “recommend that the academically selective high schools in their present form be phased out” (Macdonald, 1977, p. 71).

Ultimately, the review determined that the evidence in favour of comprehensive schooling across social and educational domains could not be ignored. The identification of and special provisions for the talented were deemed essential, and Macdonald (1977) made a myriad of recommendations for teacher training, additional resources, specialised programs, resources, and curriculum enrichment. The final report held the view that the needs of high achieving students, as a special interest group, should be recognised and met within the context of the comprehensive school system, as a part of the wider educational program for all students (Braggett, 1985).

Despite the recommendation to abolish the 13 existing selective high schools based on the Sampson (1977) research, and support for this conclusion from the

NSW Premier and Ministers at the time, selective schools remained on the educational landscape. The parents of students attending the selective schools, and influential supporters of the schools from the wider community, once again responded with strong opposition to the report that had recommended that they be phased out (Braggett, 1985). Ultimately, the selective versus comprehensive high school debate, which polarised the community, became blurred and confused with the need to provide for high academic achievers more generally within the state school system. With the issue of selective schooling inextricably linked to the concept of academic giftedness, the idea that additional and special provisions should be made for high achieving students was seen in the community as supportive of selectivity and as such, resisted. Despite these complexities, significant changes to the provision of education for GAT students within the comprehensive system were enacted across an eight-year period, although not all recommendations were realised (Braggett, 1985). Once again “the selective high school issue was diffused, although not solved” (Braggett, 1985, p. 290), and things remained unchanged until the late 1980s.

The Reformation of Education in NSW, 1988

All too often, the exceptionally talented and gifted child is neglected and discouraged within our schools. The goals of excellence and equity incorporate a responsibility to ensure that these children, as well as those who have disabilities or disadvantages, are nurtured and challenged to the limit of their ability.

(Metherell, 1989, p. 66)

The year 1988 in NSW marked another significant moment in the history of academically selective schools. The election of the Greiner Coalition Government ended a 12 year period of Labor Government administration, and saw a wide-ranging reform agenda emerging, with a key focus on a major restructure of the current education system within the state (Riordan & Weller, 2000). The approach to implementing this reform once again centred upon the commission of specific reports on all aspects of the policy agenda, via consultation with the community and educational professionals. The Carrick Report (1989) was commissioned by the then Minister for Education and Youth Affairs, Terry Metherell, to review the system, the curriculum, and the effectiveness of educational strategies in NSW, and to make explicit recommendations for legislative change.

At the same time, Metherell's (1989) White Paper on curriculum reform outlined the new Liberal Government's key move to "break down the enforced uniformity of the comprehensive high school model. Diversity and specialisation have been given a high priority within the government system" (p. 6). The Government's reform strategy had, among other themes, a crucial focus on creating greater diversity and choice of schools within the government school system, due to their concerns about the "declining status and acceptability of government schools" (Metherell, 1989, p. 6; Riordan & Weller, 2000). The Government maintained the position that increasing selective schools would permit GAT students to be catered for more adequately than was presently the case (Metherell, 1989).

The Carrick Report and the White Paper, together guided the formation of a new Education Act in 1990, which was "the most significant education legislation in NSW in the 20th century" (Riordan & Weller, 2000, p. 1). Essentially, the Act entrenched within the legislation for the first time, the Minister's authority to provide "special or additional" assistance to children with special abilities, and the power to increase different types of government secondary schools, specifically selective schools (Metherell, 1989). In the period immediately following the Act, the increase in the number of selective and partially selective schools in NSW was considerable and rapid. In 1989, eight selective schools were opened and another two were established in 1990 (Metherell, 1989). Within a period of two years, NSW went from 11 fully selective (with four agricultural schools), and no partially selective schools in existence, to 19 fully selective/agricultural and two partially selective schools by 1990 (Metherell, 1989; Vinson, 2002).

On the matter of selective schooling, the Greiner Government had a clear course of action and enacted policy change immediately. While it believed that other matters "required careful review and planning before change could confidently be initiated" (Metherell, 1989, p. 7; Riordan & Weller, 2000), the proposals for reform were "being pushed through in unseemly haste" (Riordan & Weller, 2000, p. 6). It was apparent that this landmark decision to increase the number of selective schools in NSW was based on the values and beliefs held by the Government at the time, and by supporters within the community (Riordan & Weller, 2000). There was an absence of any empirical research evidence to support the benefits of selective schooling for high academic achievers, or the claims that selective schools would

provide a more adequate education for these students than the comprehensive schools.

Additionally, this expansion of selective schooling occurred despite the Carrick Report (1989) outlining its recommendation of “restricting the places in selective schools and classes to students with exceptional talent” (p. 250). Moreover, an earlier recommendation from the Macdonald Report (1977) had called for the phasing out of selective high schools from the NSW educational spectrum, due to Sampson’s (1977) empirical findings that indicated no significant differences between selective school students matched on achievement with comprehensive school students on their examination results. Thus, it appeared once again that selective school policy in NSW was founded on little empirical evidence as to the benefits to academically achieving students, and was at odds with the recommendations furnished by commissioned reports specifically designed to inform such decisions.

In 1994, following major structural changes to the selective educational sphere in NSW, the Minister for Education was asked to evaluate the changed policy of selectivity and specialisation. This official evaluation was made in terms of the market concept of unmet demand, as there were more student applications to attend the selective schools than places available (Dwyer, 1998). On this basis, selective schools were deemed a success. This was despite the very limited research conducted “on selective schools in NSW and in the United States [and] which provides no educational justification for their existence” (Dwyer, 1998, p. 26). Despite all the years that had passed, the continued calls for solid empirical evidence were still not answered. Once more, the issue of selective schools became a volatile and uneasy topic of educational debate within the government and amongst the wider community; this led to the most widespread and comprehensive audit of public education in NSW since the 1957 Wyndham Review—the Vinson Report (2002).

The Vinson Report, 2002

Given the more than doubling of academic selective schools in NSW since 1988, the landmark Vinson Report (2002) was commissioned to assess the existing selective schools and make recommendations regarding the future of selectivity in NSW. Of particular concern was “the ‘break through’ way in which decisions to create many of the new schooling arrangements seem to be being made, without public transparency and with limited ongoing evaluation” (Vinson, 2002, p. 6).

Vinson's Inquiry gathered data via submissions from and interviews with staff, students, parents, from direct observation of schools, through access to Department of Education documents, in consultation with scholars and academics, and from a review of all Australian and international research that had investigated the academic and psychosocial effects of selective schools.

The outcomes of and recommendations arising from the Vinson Report (2002), and the justifications underpinning them were multilayered. Firstly, it was emphasised that the individual attainments of high academic achievers must be supported as a right; likewise, the benefits to the wider community that fostering human talent generates, were emphasised. In consideration of the research evidence available, it was recommended "that there be no more opportunity classes and no more fully selective high schools established in NSW... That under the auspices of the Strategic Research Directorate, the Department of Education resume research into the outcomes of selective schooling" (Vinson, 2002, p. 49).

Moreover, it was recommended that the extensive selective school system should be dismantled, to leave only the seven longest-established schools. As no recent comparison data comparing the relative performances of high achieving students in selective and comprehensive schools were available, the Inquiry could not support the claim that selective schools were needed in order to best educate high achievers (Vinson, 2002). Essentially, Vinson (2002) assessed that high academic achievers should be provided for within the comprehensive school system via curriculum extension, enrichment and extension programs, professional development of teachers, and the implementation of appropriate resources. Investment into the current comprehensive system so as to provide students with a more stimulating, enriching, and demanding educational experience to develop to their fullest extent possible was deemed vital, and of greater influence than mere selectivity alone (Vinson, 2002).

The ultimate conclusion of the Inquiry was that the NSW education system should transition to a structure where high academically achieving students are educated within the mainstream system, such that the competing values of individual achievement and the communitarian values of social cohesion could be balanced (Vinson, 2002). In light of the primary role of public education in preparing students to live in an inclusive and democratic society, it was recommended that the public education system should uphold the greatest level of local, comprehensive schooling

that meets the needs of all students. Moreover, with the limited empirical information available with which to evaluate the effects of selective schools, Vinson (2002) cautioned that research is needed before selective schooling can be supported as an effective policy for high ability education:

Year 7 to 12 schools that do not differentiate on the basis of ability or age, should be considered the norm, and any departure from this form, such as specialist and selective schools and multi-campus colleges, should be based on cogent and explicit justification of the values and evidence supporting the change (Vinson, 2002, p. 46).

Although the Vinson Report was termed the “guiding light to lead public education into the next decade” by the then NSW Education Minister John Watkins (NSW Department of Education and Training, 2002, para. 1), once again, the recommendations of a major investigative report were not enacted. The reality was that the selective schools were still meeting keen public demand within the community.

Vinson’s (2002) recommendations have particular salience for this research because they clearly highlight that the existence of academic selective schools is largely based on philosophical reasons, and reflects strong parental and political support for specialised settings for high academic achievers, rather than well-established research findings as to their benefits. The Vinson Report acutely identified the dearth of research systematically evaluating the effects of selective education settings on psychological outcomes for students, leading Vinson to call into question the value of these schools. Until such research is conducted, policy and practice in Australia will continue to operate with an absence of sound educational rationale. This problem underlines the central purpose of the present research.

In this chapter, the history of selective schooling policy in NSW has been comprehensively traced, and its connection and relevance to the current research concerns has been made clear. The final sections of this chapter present a brief outline of the current state of selective schooling in NSW, culminating in the broad implications of this review for the present investigation.

The Current Sphere of Selective Schooling

In Australia the provision of education takes place at a state level. In South Australia, Tasmania, and Western Australia, high achieving students are catered for within the local schools. Queensland and Victoria each have two selective schools,

with a primary focus on the comprehensive model, while NSW has the highest number of selective schools in Australia, with 21 fully selective schools and 25 partially selective schools (NSW Department of Education and Communities, 2013b). In 2013, there were 13,572 applicants for 4,164 vacancies in the selective high schools, attesting to just how popular these schools are (NSW Department of Education and Communities, 2013b). Historically, NSW has favoured a segregation model in addressing the needs of academically talented students, principally through the provision of separate schools and classes. This is in contrast to other Australian states, where the focus is centred upon whole-school and system-wide developments to support the needs of high achievers within the mainstream schooling system (Vinson, 2002).

There are said to be no differences between the selective and comprehensive schools in terms of staffing, teacher qualifications, resources, and administration; the only difference is the nature of the student intake (Dixon & Gow, 1993). Within the comprehensive system of high schools, students are segregated or “streamed” based on their ability, principally in Mathematics and English, often in additional academic subjects such as the sciences (Merrotsy, 2003). In response to the popularity of academically selective schools, some comprehensive secondary schools have introduced segregated classes for high achieving students that continue throughout the schooling years, based on primary school academic performance (Merrotsy, 2003). Moreover, as discussed previously, segregation on the basis of ability also occurs in the latter two years of primary school, with “Opportunity Classes”.

Implications for the Present Investigation

It seems policy has proceeded ahead of informed debate and research in the field which questions whether this type of provision is of the greatest benefit to students. It appears to be an expedient response to the pressures from advocacy groups and the need by policy makers to be seen to be doing something for this population who have been largely ignored up until now.

(Dixon & Gow, 1993, p. 2)

As is made evident by the preceding discussion, there are few topics within the educational arena that spark as much heated discussion, as does the selective school issue. The literature presented in this chapter has clearly established the complex and intricate history of the selective school debate in NSW, since their

inception in 1880. Woven into the fabric of this debate are numerous tensions exerted by the competing philosophical value strands of individualism and communitarianism, the movement towards a market orientation in schooling, and the hardened value positions taken up by invested parties within the community. The preceding discussion has clearly identified that the segregation of high achievers into selective schools was, and continues to be, based on political and emotional responses to individual needs, and lacks any rigorous research base. In respect of the small body of research that does exist, such as Sampson's (1977) study, the findings of no academic achievement benefits in the selective setting were essentially ignored. Furthermore, the multitude of governmental reports commissioned, which each have called into question the legitimacy of the selective school model, based on the lack of comprehensive evaluation of their impact on students, have also been continually disregarded.

It is apparent that the popularity of the selective schools amongst advocates has overridden any available evidence of their effectiveness, and the recommendations in key reports to phase them out. It is possible that selective schools are sound educational policy; however, there is a clear absence of empirical evaluation of current policy in support of this notion. Whilst it is necessary, indeed mandatory, to provide differentiated programming and provisions for GAT children, research needs to be undertaken to evaluate the impact of selective and mixed-achievement comprehensive educational settings on students' academic achievement and social-emotional wellbeing. Given the length of time that this educational issue has remained distinctly unresolved amongst teachers, academics, parents, and administrators, solid empirical investigation is urgently needed. It was the primary aim of the present study to answer this call.

Chapter Summary

This chapter has presented a brief summary of how the competing theoretical value strands of a focus on individual achievement versus the upholding of social cohesion, and the application of economic rationalism to the market management of education, have shaped the selective school debate within NSW. Moreover, the hardened value positions taken up by those who support or oppose the selective school model have been discussed, showing that this debate is often grounded in emotional discourse. The latter half of this chapter traced the origins and evolution of

selective schools in NSW, charting the major milestones in policy development. What emerged was the lack of a clear, empirically supported rationale for the existence and continued implementation of these schools within NSW. Ultimately, it was concluded that research that compares the selective versus comprehensive models for educating high achievers was needed to gauge the academic and biopsychosocial effects of these differing settings.

The following chapter now turns to a detailed analysis of the research literature within the field of selective education, to explore the impact of these settings on high achieving students. In outlining the rationale for the current thesis, pertinent empirical research regarding self-concept, the BFLPE, and a multitude of psychosocial wellbeing variables will be discussed. Moreover, the influential role of cultural background in affecting student outcomes will be reviewed, alongside the implications of these issues for the present investigation.

CHAPTER 3 WHAT THE RESEARCH SAYS ABOUT SELECTIVITY: ACADEMIC SELF-CONCEPT, THE BIG-FISH-LITTLE-POND EFFECT, SELECTIVE SCHOOL STUDIES, AND THE ROLE OF CULTURE

In relation to public education, among the specific issues repeatedly brought to the attention of the Inquiry have been issues concerning... the 'break through' way in which decisions to create many of the new schooling arrangements seem to be being made, without public transparency and with limited on-going evaluation.

(Vinson, 2002, p. 6)

Despite the popularity of selective high schools, relatively little research into the short- and long-term academic and other outcomes of different settings for gifted students has been conducted.

(Vinson, 2002, p. 19)

Introduction

The quotes above from Tony Vinson (2002) clearly highlight the lack of systematic evaluation of the current selective school model, and the need for solid research into this crucial educational issue. With the philosophical battlelines drawn around the selective school issue outlined in Chapter 2, the present chapter turns to analysing the body of research that has examined the impact of ability grouping practices on student achievement and wellbeing. This chapter contains six main sections. The first section outlines the importance of the academic self-concept construct. Secondly, critical issues related to the BFLPE are discussed, including empirical support for the concept, and its relation to academic self-concept. The third main section covers research on the impact of a broader range of ability grouping practices, in order to shed some light on the rarely studied selective school model. The fourth section critically evaluates the research that has investigated the academic

and other effects of the selective school model. In the fifth section, a brief orientation to each of the psychosocial wellbeing outcomes included in the present study is presented. Finally, consideration is given to the integral role of cultural background in differentially impacting student outcomes: a theme that emerged out of the qualitative component of this study. Throughout each of these sections, the rationale for the present research is developed and explicated.

Academic Self-Concept

The first section of this chapter outlines the meaning and structure of academic self-concept, situates the importance of this construct within the educational arena, evaluates extensive research on the relation of the construct to academic achievement outcomes, and finally, highlights the implications of the academic self-concept variable, particularly for high achieving students.

Definition and Multidimensional Structure

Self-concept refers to a person's sense of self, moulded via interactions with and interpretations of one's environment, and other people (Shavelson, Hubner, & Stanton, 1976). In this way, self-concept serves to structure actions and aspirations through the scheme of positive or negative self-evaluations that people have about themselves, their thoughts, beliefs, and attitudes (Hattie, 1992). Academic self-concept refers to one's perception of their abilities in a specific subject area (Byrne & Shavelson, 1986). Research has consistently demonstrated the multifaceted structure of self-concept, with academic self-concept being one facet of the self that contributes to an individual's self-perceptions, alongside other, highly differentiated, social, emotional, and physically oriented domains (Marsh & Craven, 1997; Marsh & Craven, 2006).

Extensive research has demonstrated that academic self-concept cannot be adequately measured or understood unless it too is considered from a multidimensional, domain-specific perspective (Liem, McInerney, & Yeung, 2015; Marsh, 1990c; Marsh, Trautwein, Lüdtke, Köller, & Baumert, 2006). The Marsh/Shavelson model of academic self-concept (Marsh, 1990c; Marsh, Byrne, & Shavelson, 1988) includes two distinct higher-order factors of Mathematics and Verbal academic self-concepts, with students' self-concepts in specific subject areas depicted as first-order factors (see Figure 3.1). The validity of the Marsh/Shavelson model, and especially its multidimensionality and specificity, has been supported in a

wide range of studies. Indeed, research (e.g., Liem et al., 2015; Marsh & Craven, 2006; Marsh, Trautwein, et al., 2006) has consistently demonstrated that students' achievement and self-concepts are systematically related only when considered in the matching domain. For example, Marsh and Craven (2006) reviewed an extensive body of research demonstrating that diverse academic outcomes are systematically related to their domain relevant facets of academic self-concept, but unrelated to global self-concept and other non-academic components of self-concept.

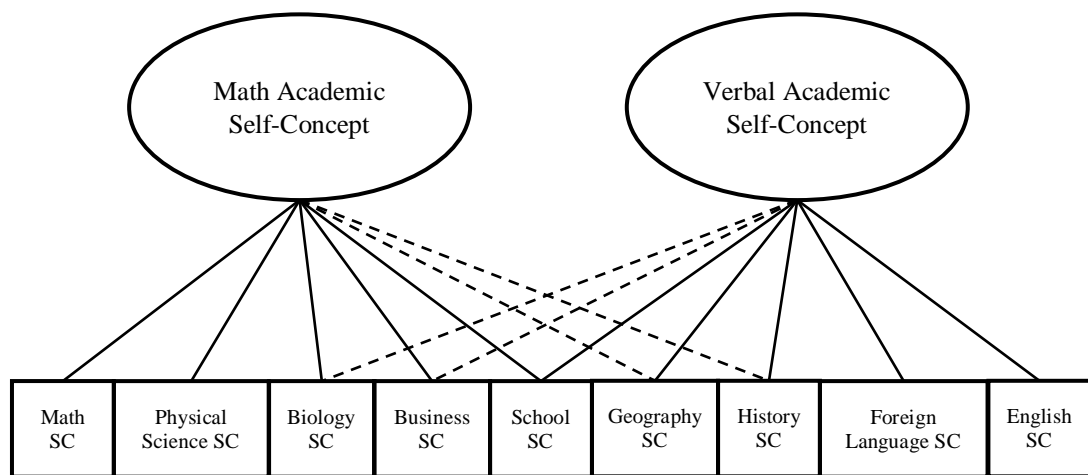


Figure 3.1 The Marsh/Shavelson model of academic self-concept.

Reprinted from “A Multifaceted Academic Self-Concept: Its Hierarchical Structure and Its Relation to Academic Achievement” by H. W. Marsh, B. M. Byrne, and R. J. Shavelson, 1988, *Journal of Educational Psychology*, 80(3), p. 378. Copyright 1988 by the American Psychological Association.

Furthermore, a factor analysis of adolescent responses to a German adaptation of the Self-Description Questionnaire III (SDQ III) has shown that the 17 self-concept factors the instrument was designed to measure were clearly identified, with the average correlation among factors only .14, thus supporting the multidimensionality of self-concept (Marsh, Trautwein, et al., 2006). Moreover, in line with theory and prior research, Mathematics and Verbal self-concepts were slightly negatively related to each other ($r = -.29$), and were systematically and positively related to the relevant subject specific academic achievement outcomes. For example, Mathematics self-concept was substantially related to Mathematics

school grades ($r = .71$), Mathematics standardised achievement test scores ($r = .59$), and taking advanced Mathematics courses ($r = .51$).

In contrast, the non-academic components were nearly unrelated to the academic achievement outcomes, with only six correlations greater than .10 in absolute value. This highly differentiated pattern of relations clearly supports the multidimensional, domain-specific perspective of academic self-concept. Hence, specific components of academic self-concept, which are most relevant to the aims of the present research, are more useful than a general domain in understanding the role of the self in predicting important criteria, and as an influential outcome.

The Importance of the Academic Self-Concept Construct

The origins of the self-concept construct, one of the most longstanding and vital in the social and educational psychology domains, date back to Socrates and Plato, and extend to Bandura and Rogers in the present day (Hattie, 1992; Marsh, 2007b; Marsh & Craven, 2006; Marsh & Seaton, 2013). Academic self-concept is seen to be a variable of key importance within educational research, not solely as a significant outcome in itself, but as a vital facilitator of growth in other valued educational outcomes (Craven & Marsh, 2008; Guay et al., 2004; Marsh, 2007b; Marsh & Craven, 2006; Marsh & Martin, 2011).

A positive academic self-concept is considered to be a driving force of, among other outcomes, subsequent academic achievement and performance (Marsh & Craven, 1997; Marsh, Seaton, et al., 2008; Valentine et al., 2004), academic effort, anxiety, confidence, and persistence in education (Marsh, 2007b), academic motivation (Guay, Ratelle, Roy, Litalien, 2010; Marsh, 2007b), interest in academic subjects (Marsh, Trautwein, et al., 2005; Trautwein, Lüdtke, Marsh, Köller, & Baumert, 2006), learning intentions, advanced coursework selection, educational and career aspirations (Eccles, 2009; Ireson & Hallam, 2009; Marsh, 1991; Marsh, 2007b; Nagy et al., 2006; 2008; Parker et al., 2012), and academic emotions, such as test anxiety (Goetz, Preckel, Zeidner, & Schleyer, 2008), and academic enjoyment (Goetz, Frenzel, Hall, & Pekrun, 2008).

Furthermore, Guay et al. (2004) found that primary school students' academic self-concepts predicted their level of educational attainment 10 years later. Indeed, academic self-concept alone has been shown to be a stronger predictor of crucial academic decisions than objective individual achievement, socioeconomic status, and other student background factors (Guay et al., 2004; Marsh & Yeung,

1997b; Parker et al., 2012; Parker, Marsh, Ciarrochi, Marshall, & Abduljabbar, 2013). Moreover, the Organisation for Economic Cooperation and Development (OECD; 2003) has concluded that academic self-concept is “closely tied to students’ economic success and long-term health and wellbeing and as such deserves to be treated alongside academic achievement as an important schooling outcome” (p. 9). Hence, it is not surprising that the fostering of a positive self-concept is considered an important, even crucial objective of education.

The Relation between Academic Self-Concept and Academic Achievement

An extensive body of research has proposed that academic self-concept and academic achievement are reciprocally related over time, such that they serve both as cause and effect of each other. This is termed in the research, the reciprocal effects model (REM; Marsh, 2007b; Marsh & Craven, 2006; Marsh & O’Mara, 2008; Seaton, Parker, et al., 2014; Valentine & Dubois, 2005). Prior academic self-concept has also been shown to be significantly positively associated with subsequent academic achievement, and prior academic achievement has also been significantly positively linked to subsequent self-concept (Guay et al., 2003; Marsh & Craven, 2006; Marsh, Trautwein, et al., 2005; Valentine & DuBois, 2005).

For example, Marsh and O’Mara (2008) utilised five time waves of data from the US Youth in Transition Study, and found significant positive reciprocal effects between academic self-concept and school grades, and between academic self-concept and educational attainment, across a longitudinal sample. Moreover, their analyses showed that self-concepts in Year 10 were a stronger predictor of educational attainments five years following high school graduation than school grades, standardised achievement test scores, intelligence test scores, and socioeconomic status. Moreover, Niepel, Brunner, and Preckel (2014) have extended the REM from the traditionally studied domains of Mathematics and English, replicating it in a third domain of German as a native language, across four measurement occasions and two independent samples. The strong theoretical, methodological, and statistical approaches (Marsh & Hau, 2007) adopted by Marsh and O’Mara and Niepel et al. not only support the REM, but also highlight its pervasive and long-term impact on students’ academic lives.

Perhaps the strongest support for the robustness of the REM emerges from the findings of meta-analyses (Valentine & DuBois, 2005; Valentine et al., 2004; Huang, 2011). Valentine et al. (2004) conducted a meta-analytic review of 55 studies

of the longitudinal relations between academic self-beliefs (self-concept, self-esteem, and self-efficacy) and academic achievement. The findings reveal that the effect of prior self-beliefs on subsequent achievement, after controlling for the influence of prior achievement, was significantly positive in 54 of 60 effects examined.

Furthermore, Time 1 achievement significantly and positively predicted Time 2 academic self-concept in 37 of 40 effect sizes considered. The results of Valentine et al.'s meta-analysis provide extensive support for the REM in a manner that would not be possible on the basis of any individual study alone.

Moreover, the REM has been found to generalise across differing developmental stages, across gender, schooling domains, and diverse countries and cultures, thus supporting the reciprocal, causal, long-term relation between academic self-concept and achievement (Guay et al., 2003; Marsh, Gerlach, Trautwein, Lüdtke, & Brettschneider, 2007; Marsh, Trautwein, et al., 2005). In a high achieving sporting context, Marsh and Perry (2005) have demonstrated that self-concept and performance are reciprocally related. Specifically, the REM was examined in a sample of 257 elite swimmers from 30 countries. The findings showed that whilst prior personal best performance significantly positively predicted subsequent championship performance, prior elite swimmer self-concept significantly positively predicted subsequent championship performance, beyond that which could be attributed to previous personal best performance. The results were replicated across two international swimming championships. Hence, the REM has been supported in a non-academic setting, a sample of top performing swimmers.

However, although the implications of academic self-concept for subsequent academic achievement have been expansively investigated in a wide variety of research settings, little attention has been directed towards the examination of this relation within an academically GAT context. There is however, a persuasive argument that examining the role played by academic self-perceptions within the context of high academic achievers is crucial for theoretical and educational practice. Litster and Roberts (2011) conducted a meta-analytic review comparing the self-concepts and perceived competencies of students considered gifted and non-gifted, utilising 40 independent studies, yielding 103 comparisons, spanning 1978 to 2004. The authors found that gifted students had significantly higher perceptions of their academic abilities than did their non-gifted peers. However, this meta-analysis did not consider the link between self-concept and subsequent academic achievement.

In a recent study, Liem et al. (2015) examined bivariate correlations between achievement and self-concept with a sample of 1,067 seventh grade students from three achievement streams (high, middle, and low) in Singapore, where a national policy of ability streaming is applied consistently across all schools. Results showed that whilst the moderate correlation between Mathematics self-concept and Mathematics achievement was of similar strength for the students in the high and middle achievement streams ($r = .38$ and $r = .39$ respectively), it was significantly stronger for students in the low achievement stream ($r = .43$). In contrast, the correlation between English achievement and English self-concept for the whole sample was relatively low ($r = .23$), and the magnitude of the relation varied significantly across the three achievement groups. The correlation was strongest for the high achievement stream ($r = .41$), followed by the middle achievement stream ($r = .36$), and the low achievement stream ($r = .25$). The findings demonstrate that for some groups of students, their self-concepts might not parallel their prior academic achievements. Moreover that these correlations, particularly in English, varied considerably across streams, led the authors to conclude that potentially distinct patterns of achievement and self-concept relations could be present across different achievement levels, and that this should be an avenue of future investigation.

In the first study to examine the REM in a GAT context, Seaton, Marsh, Parker, Yeung, and Craven's (2014; manuscript in preparation) study investigated whether the REM in relation to Mathematics self-concept and achievement extends to students classified as gifted, and is equivalent across a sample of gifted students educated in academically selective high schools and a sample of mixed-achievement students attending comprehensive schools. Utilising data gathered from 738 gifted students from two academically selective high schools and 2,048 mixed-achievement students from six comprehensive high schools, measured longitudinally across four time points, Seaton, Marsh, et al. found that the REM was supported for both groups of students. Mathematics self-concept significantly positively predicted subsequent Mathematics achievement (β range = .060 - .062), and vice versa (β range = .068 - .072). Furthermore, the findings indicate that, contrary to Liem et al.'s (2015) conclusions, there was no difference in the size of the paths for both groups, suggesting that the strength of the REM was equivalent across differing achievement levels.

It is important to note that whilst the present investigation is based on a subsample of the data from which the Seaton, Marsh, et al. (2014) study is derived, that study investigated the REM from a gifted student versus mixed-achievement student context, and only considered the domain of Mathematics. Furthermore, the Liem et al. (2015) study only considered bivariate correlations in the unique ability-grouping context of the Singaporean education system. Hence, it is still not known whether the reciprocal relations between Mathematics, English, and General School self-concept and their related academic achievement outcomes are present in and equivalent for, high achieving students educated in differing schooling contexts: that is, academically selective or mixed-achievement comprehensive. The extent to which the REM can be found in, and is equivalent across the diverse academic settings for high achievers, is an investigative objective of the present study.

Implications of Academic Self-Concept for High Achieving Students

The extensive body of empirical research cited above clearly demonstrates that there is a research tradition that supports the notion that a positive academic self-concept is a vital ingredient in creating optimal educational outcomes. A higher self-belief in one's own academic capabilities has been linked to higher educational attainment, higher educational and career aspirations, more advanced course selection, and university attendance. Even more than this, it has been shown in the research that a positive self-concept is critical for good mental health and functioning. REM research has also shown that academic self-concept and academic achievement share a dynamic and mutually reinforcing relation, whereby a higher academic self-concept predicts higher academic achievement, and vice versa.

Indeed, the worth of REM research for educational theory and practice is salient. The research conclusion is that, in order to ensure students attain their full potential at school and beyond, and to safeguard the stability of their academic achievements, both academic self-concept and academic achievement need to be enhanced simultaneously (Marsh, Seaton, et al., 2008; Seaton & Craven, 2011). However, despite the importance of a positive academic self-concept for attaining advantageous student outcomes, research has also shown that the fostering of a positive academic self-concept is an objective that has often been undermined when high achieving students are educated in academically selective settings. It is this negative interaction between academically selective settings, academic self-concept, and academic achievement that is the focus of the next section.

The Big-Fish-Little-Pond Effect

This second main section presents a detailed overview of the BFLPE. The theoretical rationale underlying the model, the extensive body of research evidence that supports it, findings pertaining to constructs beyond academic self-concept, and the implications of BFLPE research for high academic achievers, are outlined. Lastly, the links between the extensive bodies of academic self-concept and BFLPE literature are drawn together to examine the implications for the present thesis.

Theoretical Basis of the BFLPE

Many governmental departments, policy makers, educators, and parents have made, and continue to make, the assumption that there are benefits for high achievers in being educated in an environment where the average academic standard of peers is also high (Vinson, 2002). The rationale is that a homogenous group of students of similar achievement levels should provide an educational context in which learning and teaching, commensurate with individual requirements, can be said to occur (Retelsdorf, Becker, Köller, & Möller, 2012). Hence, the aim of academic segregation is to provide the best learning environment for the fostering of potential for those students deemed most able.

However, it was Davis (1966) who first found that male college students achieved a higher grade point average and had higher career ambitions if they were educated in a college where the comparative academic standard of their peers was lower, than an environment where the relative scholastic aptitude of their peers was higher. These findings led Davis to suggest that “the aphorism ‘It is better to be a big frog in a small pond than a small frog in a big pond’ is not perfect advice, but it is not trivial” (p. 31). Davis questioned the belief that attending the top performing school represented the best route to career success, and advised parents against sending their sons to these schools if they thought they would be among the lower academic ranks, compared to their classmates.

Building on the sociological research of Davis (1966), in addition to theoretical advances in the social sciences and psychology, Marsh (1984; 1987a; 1991; Marsh & Parker, 1984) elucidated the psychological mechanisms through which students in schools with a high academic standard possessed lower self-perceptions of their capabilities than would have been anticipated based on their individual achievement alone. This phenomenon is termed the big-fish-little-pond effect (BFLPE; Marsh & Parker, 1984). The BFLPE model conceptualises the

function of social comparison frames of reference and school contextual factors in the formation of a student's academic self-concept (Marsh & Hau, 2003).

Essentially, social, temporal, dimensional, and criterion-oriented comparisons combine to form one's academic self-concept—individuals compare their performance with the performance of others (Festinger, 1954; Marsh, 1987a), with their prior performance (Albert, 1977; Rheinberg, 2006), with their performance in other areas (Marsh, 1986; Marsh & Hau, 2004; Möller & Köller, 2001; Möller & Marsh, 2013; Möller, Pohlmann, Köller, & Marsh, 2009), and with particular standards (Jonkmann, Becker, Marsh, Lüdtke, & Trautwein, 2012).

Hence, the same objective indicators of academic achievement can cause different academic self-perceptions, depending on the comparison criteria or frames of reference that students have available to them through which to evaluate their capabilities (Marsh, 2007; Marsh & Craven, 2006; Marsh, Seaton, et al., 2008). BFLPE research operationally defines the frame of reference as the average academic achievement level of other students in the classroom or school as one ingredient for formulating academic self-concepts (Marsh, 1984; Marsh 1991; Marsh & Craven, 2002). Utilising this operational definition, the theoretical model underlying the BFPLE (see Figure 3.2) puts forth that whilst individual student achievement is positively related to academic self-concept (i.e., "I'm doing really well academically, so I feel good about my ability"), there is a negative association between school and class average achievement and academic self-concept (i.e., "My classmates are really intelligent, so I'm not very intelligent"), after controlling for individual achievement (Marsh, 1984). It is this negative association that typifies the BFLPE.

Fundamentally, the model holds that students educated in schools where the average achievement level of their peers is high will have lower academic self-concepts than their equally high achieving counterparts in lower- and mixed-achievement level school settings (Marsh 1991; Marsh & Hau, 2003; Marsh, Seaton, et al., 2008). This is because, as the average academic standard of the class or student body differs depending on the educational setting attended, so too does the relative ranking of a student's academic attainments differ in relation to their peers (Trautwein, Gerlach, & Lüdtke, 2008). In a mixed-achievement school setting, a high achieving student compares favourably to his or her class and school peers, and therefore develops a positive academic self-concept (i.e., big fish in a little pond).

Conversely, in a high achieving school context, the same student may be outperformed by other, higher achieving peers, thus leading to negative effects for their academic self-concept (i.e., little fish in a big pond).

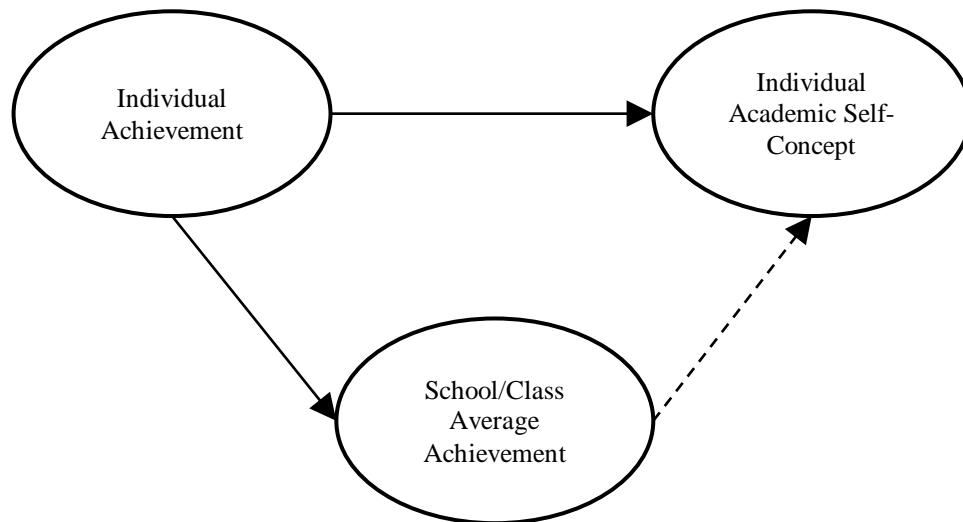


Figure 3.2. Theoretical predictions of the big-fish-little-pond effect (BFLPE). Adapted from “Big-Fish-Little-Pond Effect on Academic Self-Concept: A Cross-Cultural (26-Country) Test of the Negative Effects of Academically Selective Schools” by H. W. Marsh, and K. T. Hau, 2003, *American Psychologist*, 58(3), p. 369. Copyright 2003 by the American Psychological Association.

BFLPE researchers (Marsh, Seaton, et al., 2008; Marsh, Trautwein, et al., 2008; Seaton et al., 2008; Trautwein, Lüdtke, Marsh, & Nagy, 2009) explain that the social comparison processes that underlie the BFLPE are unavoidable: “imposed, implicit, in relation to a generalized other” (Marsh, Seaton, et al., 2008, p. 326)—that is, the reference group. The school context is typified by evaluation and competition, and comparisons with classmates are a core feature (Covington, 2000; Dijkstra, Kuyper, van der Werf, Buunk, & van der Zee, 2008; Liem, Ginns, Martin, Stone, & Herret, 2012). Students have available to them a diverse array of indicators against which to evaluate their own achievement, including school grades, teacher feedback, and feedback from peers. Hence, their comparative academic standing in relation to their class and schoolmates is relatively salient, and “students use the average level of academic accomplishments of other students within their school to form a frame

of reference against which to evaluate their own academic accomplishments” (Marsh, Seaton, et al., 2008, p. 326).

Empirical research has indeed demonstrated that students utilise social comparison processes to evaluate their academic accomplishments in relation to their current frame of reference (Chmielewski, Dumont, & Trautwein, 2013; Huguet et al., 2009; Marsh, Kuyper, Morin, Parker, & Seaton, 2014; Trautwein et al., 2009). In the first study to directly measure social comparison processes, Huguet et al. (2009) asked students to evaluate their academic performance in relation to other students in their class, in French and Mathematics. They found that after controlling for these measures of social comparison, the BFLPE was no longer evident. Thus, Huguet et al. concluded that it is better for academic self-concept to be a high achiever in a field of average achieving students than to be a high achiever in a field of other high achievers.

In an extension of the direct measures of social comparison employed by Huguet et al. (2009)—that is, individual student rankings of their own ability in relation to their class, and based on measures further developed by Trautwein et al. (2009) in related reflected glory effect research—Marsh et al. (2014) investigated frame of reference and social comparison processes further, by including student perceptions of how their class compares with other classes within their school, and how their school compares to other schools. Employing a sample of 15,356 Dutch ninth grade students from 651 classes in 95 schools, the findings showed that controlling for direct measures of social comparison significantly reduces the BFLPE. In fact, significantly negative BFLPEs at the school level were basically eliminated, absorbed by even larger negative BFLPEs at the class level. Hence, this study further supports the social comparison basis of the BFLPE.

A study conducted by Chmielewski et al. (2013) also shed further light on the clear role played by social comparison processes in the BFLPE. The authors juxtaposed the effects of three different types of tracking on students’ academic self-concepts: (i) between-school streaming, where high achieving students attend completely separate schools (such as in Australian selective schools); (ii) within-school streaming, where students are tracked within schools and streamed for all school subjects; (iii) and course-by-course tracking, where students are tracked within schools only for particular subjects (as typically occurs in Australian

comprehensive schools). Significant BFLPEs were found for the within- and between-school streaming contexts.

However, contrary to the BFLPE, within the course-by-course setting, higher achieving students possessed more positive self-concepts, and lower achieving students reported lower self-concepts (Chmielewski et al., 2013). The findings highlight that the type of tracking environment invokes differing social comparison processes, and therefore differing reference groups for evaluation and subsequent self-concept formation. Specifically, students in the between- and within-school streaming contexts were only ever exposed to students in the same academic track. Conversely, when students were grouped only in a subject-by-subject manner, the salient reference group comprised a variety of students of all achievement levels. These findings clearly show the detrimental effects that a frame of reference typified by a high achievement level (class- and school-average) can have on academic self-concept formation.

Further Theoretical Advances: The Local Dominance Effect

A recent theoretical perspective, called the local dominance effect (Alicke, Zell, & Bloom, 2010; Zell & Alicke, 2009; 2010), has emerged as particularly relevant to the BFLPE. Specifically, this perspective postulates that individuals tend to base their self-perceptions of their academic capabilities on the most local frames of reference, as opposed to more distal, general ones, even when they know that the more general frames of reference may offer a more representative and appropriate measure of their academic standing relative to their peers. Recent research has supported theoretical predictions integrating BFLPEs and local dominance effects (e.g., Liem, Marsh, Martin, McInerney, & Yeung, 2013; Liem et al., 2015; Marsh et al., 2014).

Utilising a sample of 4,461 secondary students in Singapore, Liem et al. (2013) examined the presence of the local dominance effect within an educational context that implements nation-wide ability streaming within schools at low, middle, and high levels of ability. The researchers contrasted the negative effects of the average Mathematics and English achievement levels of students in the same class, the same stream, and the same school on Mathematics and English academic self-concepts, thus examining BFLPEs as a function of three contextual frames of reference. In support of the local dominance effect, stream-average achievement was found to play a more salient role than, and completely subsumed, school-average

achievement in both Mathematics and English self-concepts. In an educational environment that implements system-wide ability grouping, there was more variability at the stream level than at the school level. Hence, when individual academic achievement was controlled for, the negative effects of stream-average achievement on self-concept were larger than those of school-average achievement.

However, Liem et al. (2013) also found that the effect of stream-average achievement was stronger than class-average achievement for Mathematics self-concept, and statistically similar to class-average achievement for English self-concept. This is surprising given that class-average achievement is the more local frame of reference, and is therefore expected to have a more salient and influential effect on academic self-concept formation (Zell & Alicke, 2009, 2010). In a context like Singapore, where ability grouping is a clear and explicit characteristic of the educational system, and students only attend classes with students from their same ability stream, ability stream is likely to be highly salient for students in relation to their academic achievement and self-concept (Liem et al., 2013). Hence, Liem et al. (2013) concluded that in light of the specific nature of the Singaporean education system, it was appropriate to expect that academic self-concepts are more likely to be affected by stream membership than class membership, thus supporting the local dominance effect.

Moreover, the differing findings for the effects of stream- and class-average achievement on Mathematics and English self-concepts also highlighted the importance of considering academic domains separately when evaluating frame of reference effects. Indeed, Liem et al. (2013) argued that it might be that the extent to which students use the achievement of others in particular contexts in forming their academic self-concepts, may vary across academic domains. This latter point is particularly relevant for the present investigation, which has a purposely domain-specific focus.

In a BFLPE application of latent three-level models (students nested within classes, classes nested within schools), Marsh et al. (2014) investigated the simultaneous effects of class- and school-average achievement on students' academic self-concepts. In support of the local dominance effect, class-average achievement (the more proximal frame of reference) had a more negative impact on academic self-concept than did school-average achievement. In fact, the significantly negative BFLPEs at the school level were eliminated once the effects of class-average

achievement were controlled. In terms of the present investigation, the selective school has much less variation in achievement, both across the school and within classes, than the comprehensive school context, which may explain any potential differences in academic self-concept between the two settings.

Empirical Support for the BFLPE

The BFLPE has found rich and extensive theoretical and empirical support. In one of the earliest BFLPE studies, utilising 305 students from six Australian primary schools, Marsh and Parker (1984) assessed the academic self-concepts of students who were located either in high or low SES schools. Although students were not overtly segregated according to their academic achievements, the students within the high SES schools had above average intelligence scores, while students in the low SES schools had scores that were below average. Marsh and Parker found that whilst individual academic achievement (comprising IQ scores, reading achievement scores, and teacher ratings of capabilities) had a significantly positive impact on the student's academic self-concepts, when individual achievement was controlled for, school average achievement was significantly negatively related to academic self-concept. Thus, this formative research demonstrated that students of the same academic standard in high achievement and high SES schools possessed more negative academic self-concepts than equally achieving students in lower achievement/low SES schools. These findings led the authors to question, "is it better to be a relatively large fish in a small pond even if you don't learn to swim as well?" (Marsh & Parker, 1984, p. 229)

Since the formative Marsh and Parker (1984) study, the BFLPE has found pervasive support in a myriad of studies across diverse academic domains (Nagengast & Marsh, 2011), in non-academic domains such as physical activity (Trautwein et al., 2008), at differing levels of education (Craven et al., 2000; Jackman, Wilson, Seaton, & Craven, 2011), in varying countries and cultures (Liem et al., 2013; Marsh & Hau, 2003; Seaton, Marsh, & Craven, 2009; Nagengast & Marsh, 2012; Van de gaer, Grisay, Schulz, & Gebhardt, 2012), in experimental and quasi-experimental conditions (Alicke et al., 2010; Marsh, Köller, & Baumert, 2001; Wouters, De Fraine, Colpin, Van Damme, & Verschueren, 2012), and in relation to various educational outcomes (Craven et al., 2000; Marsh, 1991).

Research, attesting to its robustness, has also found that few constructs (e.g., study methods, motivation, learning orientations) serve to moderate the BFLPE

(Seaton, Marsh, & Craven, 2010; Seaton, Marsh, Yeung, & Craven, 2011). It is only when students have changed from a higher to lower academic track during high school (that is, changed their frame of reference), that significant positive increases in their academic self-concepts, compared with those students who remained in the same academic track, have occurred (Wouters et al. 2012). Moreover, the negative effects of attending an academically selective school on self-concept have been found to be long lasting, persisting four years after graduation from high school (Marsh, Trautwein, et al., 2007).

In one of the widest ranging BFLPE studies to date, Seaton et al. (2009) evaluated the BFLPE with nationally representative samples of 265,180, 15 year old students from 41 culturally and economically diverse countries, who participated in the 2005 OECD Programme for International Student Assessment (PISA) study. Seaton et al. found that the BFLPE was present both in collectivist and individualist cultures, and in economically developing and developed nations. In support of the BFLPE, school average Mathematics achievement had a negative effect on Mathematics self-concept across the total sample, after controlling for individual achievement. The size of this effect was large and significant at .49. Furthermore, the negative association between school-average achievement and self-concept was found in all 41 countries when considered in isolation, and was statistically significant in 38 countries.

Nagengast and Marsh (2012) included additional countries and a greater diversity in the economic development of countries, to study the BFLPE. Across 123 different samples involved in PISA 2006, the effect of school average achievement on Science self-concept was negative in all but one case, and statistically significant in 114 cases. Moreover, the negative contextual effects were also found to be far reaching for career aspirations in Science, and consistent across countries. The findings of the Seaton et al. (2009) and Nagengast and Marsh (2012) studies highlight the robustness and broad generalisability of the BFLPE, and the universality of the negative effects of achievement segregation for educational policy and practice.

In a recent extension of the BFLPE model, Wilson, Siegle, McCoach, Little, and Reis (2014) investigated the effect of additional pressures, such as increases in the complexity and rigor of the curriculum, placed on students grouped with more academically achieving peers, alongside the negative effects of class- or school-

average achievement on academic self-concept. When academically high achieving students are grouped together for instruction, the intent is to raise the level of academic challenge as compared to regular classes. Hence, the increased difficulty in content, higher expectations for work, and the greater effort needed to maintain high academic achievement, may also contribute to a decline in students' academic self-concepts. The results demonstrate that both class- and school-average achievement and increased difficulty of curriculum were significant negative predictors of self-perceptions, but that social comparison processes were still the most salient. The findings suggest that both social context and difficulty of coursework impact students' self-perceptions of their academic abilities.

The BFLPE and its Relations with Other Important Outcomes

The educational significance and implications of BFLPE research have been criticised by researchers, who argue that the almost exclusive focus on academic self-concept as the outcome variable is too narrow (Plucker et al., 2004; Rindermann & Heller, 2005; Trautwein & Lüdtke, 2005). However, a body of research has demonstrated that the negative effects of attending a school where the academic standard is high, has long-lasting implications that extend beyond those found for academic self-concept. Marsh (1991), utilising a sample of US high school students surveyed in Years 10, 12, and two years after graduation from high school, found that, controlling for background and individual achievement, the higher the school-average achievement level, the lower the students' academic self-concepts, educational aspirations, advanced coursework selection, school grades, academic effort, standardised test scores, occupational aspirations, and college attendance.

Moreover, these negative associations between school-average achievement and the academic outcomes measured were significant for almost all of the outcomes tested across the longitudinal timespan of the study. Academic self-concept was found to substantially mediate the negative effects of school-average achievement on the other outcomes. The Marsh (1991) findings laid the foundations for demonstrating that the negative impact of attending schools where the achievement level of the study body is high, encompasses other key educational outcomes beyond academic self-concept.

A study by Craven et al. (2000) compared high achieving Australian primary school students placed in a regional selective GAT program, with high achieving students educated in mixed-achievement and streamed classes within schools on

various outcomes, including academic self-concept and non-academic self-concept (Appearance, Physical, Parent Relations, Peer, and General self-concept), motivational orientations (Mastery, Ego, Competitive, Individual, Cooperative, and Intrinsic orientations), and Reading and Mathematics achievement. Craven et al. found that students in the selective program had significantly lower Appearance, Physical, Peer, and General self-concepts at Time 2 than high achieving students in both the streamed and mixed-achievement classes. There were no significant differences between these groups in terms of Parental Relations self-concept. In terms of motivational orientation, selective program students reported significantly more negative Mastery, Cooperation, and Intrinsic motivation scores than both the streamed and mixed-achievement class groups. There were no significant differences between these groups in terms of Ego, Competitive, and Individualistic motivational orientations.

In relation to academic achievement, Craven et al. (2000) reported that selective students' scores did not significantly differ to either comparison group. Thus, these findings cumulatively show that students in the academically selective program had greater declines across an array of psychosocial outcomes than did students in streamed and mixed-achievement settings. The findings led the authors to conclude "the results of the present investigation do not support selective GAT programs in relation to their intended outcomes of improving academic self-concept and desirable motivational orientations in comparison with alternative strategies such as mixed-ability classes" (Craven et al., 2000, p. 70).

Other recent research has also highlighted this latter point. Trautwein et al. (2008) found that class average physical performance negatively affected not only students' physical self-concepts, but also their continuing engagement in physical activity. Furthermore, Trautwein et al. (2006) broadened BFLPE research by examining frame of reference effects in relation to students' individual academic interest in Mathematics, which encompassed personal importance, attainment value, and intrinsic value in engaging in Mathematics. In line with BFLPE research, the study found that whilst individual achievement significantly positively predicted academic self-concept and interest, school average achievement was significantly negatively related to both outcomes. Students in the highest academic track exhibited significantly lower academic interest and self-concepts than did students in the lower academic track, after controlling for individual achievement. Moreover, self-concept

was found to mediate the effects of track membership on interest almost completely, once more attesting to the importance of the self-concept construct in school settings.

In a longitudinal analysis of students on five occasions spanning eight years from Year 10 to five years following graduation from high school, Marsh and O'Mara (2010) found that students who attended schools with a higher school-average achievement level had significantly lower academic self-concepts, grade point averages, educational aspirations, and career aspirations across the timespan tested. Moreover, supporting the importance of a positive academic self-concept in facilitating the growth of fundamental educational outcomes, academic self-concept substantially reduced the magnitude of the negative effects of high school-average achievement on the educational outcomes.

Marsh and O'Mara's (2010) findings demonstrated the long-term negative impact of the BFLPE for vital educational and career variables, showing that the adverse effects persisted years after the completion of high school. The results of this study, and the body of research cited, appear to undermine most of the existing educational policy and practice on the placement of high achieving students in academically selective schools. Marsh and O'Mara "maintain that some—but not necessarily all—academically advantaged students will suffer losses in a number of important outcomes when attending high-ability high schools, due to the social comparison process that such contexts invoke" (p. 26).

Whilst the above discussion has shown that there is an emergent collection of empirical literature supporting the notion that attending schools or classes where the academic standard of the student body is high, has negative implications for a selection of educational outcomes beyond academic self-concept, this research has focused primarily on academically oriented variables, such as educational choices and aspirations. Indeed, these variables are of vital importance; however, other student-centred outcomes that relate to psychosocial wellbeing, are also of critical concern in fostering students' potential across their academic lifespan.

For this reason it was a central goal of the present investigation to generate further knowledge of the effect of academically selective environments for constructs beyond academic self-concept, by investigating the implications of differing schooling settings (academically selective and mixed-achievement comprehensive) for high achievers' academic buoyancy, relations with parents, pressure to achieve from significant others, and depressive and anxious tendencies. More precisely, it is

not known how these psychosocial variables could be affected by attending differing educational contexts, and whether this impact occurs similarly or differently across the environments.

Implications of the BFLPE for High Achieving Students

A wealth of BFLPE and REM research spanning over 30 years has suggested that educational policies like “selective schooling may be counterproductive as they place children in a high average ability context and thus may have a negative effect on academic self-concept” (Parker, Marsh, Lüdtke, & Trautwein, 2013, p. 80). However, the majority of BFLPE research in Australia is dated, undertaken prior to recent advances in research methodology. In addition, it has been conducted almost exclusively with primary school students (Craven et al., 2000; Marsh, Chessor, Craven, & Roche, 1995; Marsh & Parker, 1984), with only one study considering the effect in high schools (Marsh, 2004). Thus, there is a critical need to examine these issues for high achieving students in the contemporary schooling context. Indeed, if the selective school environment does in fact serve to undermine students’ academic self-concepts, as in the BFLPE, and it follows that these lowered self-perceptions are likely to undermine subsequent academic accomplishments, as in the REM, then the extent to which the school context enables or impedes the growth of a positive self-concept is a critical educational concern.

As this review has shown, there is a convincing body of research indicating that a decline in academic self-concept due to the BFLPE matters, because of the long-term effects that academic self-concept has been found to have on academic achievement and many other favourable educational outcomes. The argument is that although a significant number of higher achieving students tend to have higher academic self-concepts, based on the BFLPE research it is probable that some students in selective schools will have lower academic self-concepts than many high achieving students in comprehensive schools. Hence, a body of high achieving students may not be reaching their full potential when they are educated in academically selective schools.

The present study, although not an explicit test of the BFLPE, quantitatively examines the impact of differential achievement contexts on the academic self-concepts of students, adding to the contemporary research. Moreover, the qualitative component of this study elucidates previously undiscovered insights into the operation of the BFLPE in Australian schools, from the students themselves. By

interviewing purposefully selected high achieving students who self-reported either low or high academic self-concepts from the selective school, and from a mixed-achievement school, there is potential for rich information to be gained regarding the mechanisms that underlie the BFLPE.

Additionally, implicit in the research is the logically-implied connection between the high average achievement context generated by an academically selective environment, and academic self-concept (BFLPE research), and the subsequent effect of academic self-concept on later academic achievement (REM research), based on separate BFLPE and REM findings that previously, have not been investigated in the same study. Hence, it was a principal aim of this present investigation to examine both the BFLPE and REM, by investigating the impact of differing school environments (academically selective and mixed-achievement comprehensive) that generate differential average achievement contexts on high achievers' academic self-concepts, and the subsequent relation of academic self-concept to later academic achievement, as specified by the REM.

Integrating Academic Self-Concept and the BFLPE: Implications for the Present Investigation

Despite the extensive body of research supporting the reciprocal relations between academic self-concept and academic achievement across a diverse array of settings, there is a gap in the published research for studies examining whether the REM is upheld within the GAT context. More specifically, it is not known whether the same predictive relations are present and of the same magnitude for high achieving students educated within contrasting educational settings, specifically academically selective schools and mixed-achievement comprehensive schools. Indeed, questions such as whether or not the REM exists, and the extent to which it is equivalent for both school settings, have crucial implications for how to best educate our highest achievers. If groups of high achieving selective students have lower academic self-concepts than similar numbers of high achievers in the comprehensive setting, and academic self-concept is positively related to academic achievement for both of these groups, then the selective environment in its current form may not be producing the best possible outcomes for all of the students who attend them.

Moreover, with regard to the role of the causal relation between prior academic self-concept and subsequent academic achievement in relation to the BFLPE, it is surprising that BFLPE research typically cites REM findings to support

that the lowered self-concepts found in BFLPE studies would logically lead to lowered achievement levels, without explicitly testing for this connection. It is the aim of the present investigation to conduct a comparison of the impact of academically selective and mixed-achievement school settings on academic self-concept, and to examine the ensuing relations between academic self-concept and academic achievement for groups of students in differing schooling contexts.

The academic self-concept and BFLPE research having been addressed, the next section of this chapter moves to a discussion of ability grouping practices more generally, and to the research evidence for its impact on academic achievement and wellbeing outcomes.

Beyond the BFLPE: Research on Academic Segregation

There is an extensive body of research pertaining to ability grouping practices generally. This third main section details the various forms and applications of ability grouping practices, and presents the research findings regarding its impact on academic and non-academic outcomes for students.

Defining Ability Grouping

Around the world, students are grouped according to their academic levels in many ways, the nature and extent of which differ dramatically, both between and within countries (LeTendre, Hofer, & Shimizu, 2003). Grouping can occur implicitly or explicitly, between-schools, within-schools, between-classes, within-classes, as streaming, tracking, grouping or re-grouping (Ireson, Hallam, & Hurley, 2005; Maaz, Trautwein, Lüdtke, & Baumert, 2008; Robert, 2010). Implicit grouping at the school level is dependent on the catchment areas of schools (most prominently in the US), whilst explicit between-school grouping refers to the practice of assigning students to different school types based on their prior achievement, such as academically selective schools in Australia or the secondary school “tracking” system in Germany (Maaz et al., 2008). Between these latter two countries however, the systems of segregation, the specifics of which are elaborated on in the next section, are markedly different. Within-schools, students can be “streamed” into “A”, “B”, and “C” classes and so on for all academic subjects, based on overall academic achievement, or they may be allocated to separate achievement-based classes for individual subjects for which the terms “regrouping” (in Australia or the US) or

“setting” (UK) are used (Macqueen, 2013). This latter practice is common in Australian comprehensive schools.

Indeed, the stark differences between the educational systems operating within countries are one contributing factor making comparisons across studies of the effects of ability grouping, inherently difficult. Currently in the UK, there is a resurgence of setting within schools in response to an increased focus on academic performance, similar to that being seen in Australia with the emergence of the National Assessment Program (NAPLAN), which allows the comparison of school performances across standardised tests (Macqueen, 2013). At the same time, in the US, there are calls for “de-tracking”, in response to concerns regarding the effectiveness and equity of tracking (Ireson et al., 2005). Within these countries, the divergent attitudes toward ability grouping represent enduring concerns regarding the efficacy of these practices.

Research on Ability Grouping and Academic Achievement

International research on the effects of ability grouping on students’ academic performance does not provide unequivocal conclusions regarding the relative effectiveness of homogenous or heterogeneous grouping practices (Ireson et al., 2005). Reviews of the research have concluded that the results of ability grouping studies have been contradictory and inconclusive, varying across studies, samples, countries, type of grouping method utilised, comparison groups included, and the background variables controlled for (Ireson & Hallam, 2001; Kulik & Kulik, 1982; 1992; Slavin, 1990). Although there is a wide expanse of literature pertaining to this topic, there are major methodological issues relating to the inclusion of inadequate comparison groups, and the failure to account for pre-existing student differences (Neber, Finsterwald, & Urban, 2001).

In a comprehensive synthesis of meta-analyses summarising over 300 studies of ability grouping effects, Hattie (2013) evaluated tracking across a wide variety of schooling contexts, in most school subjects, across all age ranges, and for most major educational outcomes. The synthesis revealed that the overall effect of tracking was small ($d = .11$), and that overwhelmingly the findings show that tracking has minimal effects on academic outcomes. The overall effect sizes for the three major achievement levels across all of the considered studies were .14 for the high track, -.03 for the middle track, and .09 for the low track, leading Hattie to conclude that “no one profits” (p. 90). Conversely, Hattie found that the effect of ability grouping on

equity outcomes was strong and negative. Specifically, qualitative research (e.g., Ireson & Hallam, 2005; Oakes, 2005) has consistently revealed differences in instructional pace and teaching methods between the tracks, and that differential access into the tracks was based on social class variables, alongside academic achievement.

Hattie (2013) argues that there exists a conundrum in the ability grouping research: the empirical evidence shows a close to zero effect from tracking, and yet the qualitative literature indicates that lower track classes are more fragmented, less engaging, and are taught by less-highly trained teachers than higher track classes. Hence, Hattie speculates that it may be the learning environments created within these high achievement classes or schools, and the mechanisms and processes of learning that they foster, that are more critical for producing academic benefits than the compositional structure of the classes themselves.

Indeed, the evidence seems to indicate that the educational settings that offer the greatest curriculum differentiation tend to produce academic attainment benefits for high achievers. Consider the example of the German educational system, which is said to be the most strictly stratified school system of the Western industrialised countries (Trautwein et al., 2006). This explicit, between-school tracking system assigns students either to academic track schools that typically prepare students for university entrance or to non-academic track schools that usually prepare students for vocational apprenticeships (Maaz et al., 2008). As such, the tracks differ extensively with regard to compositional factors such as the average achievement level of the student population, and institutional factors such as a clear differentiation of the curriculum and teacher training (LeTendre et al., 2003). In the German school system, the tracking of students directly impacts their future career outcomes (Retelsdorf et al., 2012). In other countries, such as Australia, with its selective versus comprehensive school systems, this association does not occur, and students in both settings are able to apply for university entrance.

Research on tracking in German-speaking countries has shown beneficial academic effects for those located within the high track. For example, Maaz et al.'s (2008) review of the literature investigating the effects of the German school system found that being educated in the higher academic track produced gains in student learning. Overall, they determined that "when tracking is associated with intended or unintended institutional differentiation (e.g., increased curricular demands, more

teacher training, and superior instructional quality), there is an independent institutional effect, above and beyond the composition effect” (Maaz et al., 2008, p. 104). Moreover, Becker, Lüdtke, Trautwein, and Baumert (2006) utilised latent change models and multi-group structural equation modelling to study the Mathematics achievement gains of 1,864 students of the German Third International Mathematics and Science Study (TIMSS) sample. The findings showed differential achievement trajectories across school type, with disadvantages for students attending non-academic tracks. Hence, there appears to be empirical support for differential achievement outcomes between different tracks in Germany.

Echoing this, findings from a recent experimental intervention study in Greece showed that the implementation of an expertly developed, differentiated instruction learning environment within a calculus class of mixed-achievement students produced significantly positive benefits on student engagement, motivation, and understanding of complex concepts (Konstantinou-Katzi, Tsolaki, Meletiou-Mavrotheris, & Koutselin, 2013). Indeed, research has shown that teachers’ beliefs, knowledge, and pedagogical practices differ between tracks: teachers in higher track schools provide greater problem solving and cognitively stimulating instruction, whereas lower track schools tend to focus on exercises and repetition (Baumert et al., 2010; Hallam & Ireson, 2005; Kunter & Baumert, 2006).

For example, Hallam and Ireson (2005) studied 1,500 teachers from 45 UK schools who taught mixed and ability grouped classes. The findings showed that teachers differentiated the curriculum more in ability-grouped classes: by content, depth, activities engaged in, and resources utilised. Compared to those in the higher track, the lower track students were given more tasks that required rehearsal and repetition, more structured work, more practical work, fewer opportunities for discussion, less access to curriculum, less homework, less-detailed feedback, and slower-paced work at an easier level. The clear differences in pedagogy that were evident in the responses of teachers who taught in both mixed-achievement and ability grouped settings, suggest that it is the compositional structure of the classes themselves that leads teachers to modify their teaching practices, rather than being a function of their own individual teaching style. Likewise, in a recent study, Baumert et al. (2010) observed significant differences between teachers from academic and non-academic tracks in terms of content knowledge and pedagogical practices.

However, even the conclusions regarding the efficacy of tracking in Germany can be unclear. In one of a limited array of studies to investigate the effects of tracking on reading achievement, Retelsdorf et al. (2012) compared the developmental trajectories of reading comprehension and decoding speed between tracked German students, utilising a longitudinal design with three occasions of data collection, drawing on a sample of 1,508 students from 60 schools. Students within the different tracks were closely matched on a myriad of variables (e.g., gender, age, social background, parents' education, cultural background, student's achievement) using propensity scores, allowing for the comparison of equivalent groups of students with the same probability of belonging to either academic or non-academic track schools. Contrary to the author's expectations, multi-group latent growth curve models showed no significant track differences in growth for Reading Comprehension. However, benefits for academic track students were supported with regard to growth in Decoding Speed, compared to non-academic track students.

Hence, Retelsdorf et al. (2012) concluded that, compared with the beneficial effects of tracking found for Mathematics, the differences found for Reading achievement appeared to be smaller, and that they contribute to an increasing body of literature that suggests within particular domains, ability grouping could have some undesired consequences that may grow during students' further development, and affect their educational outcomes. "Accordingly, the question of whether these students particularly benefit from tracking remains unanswered" (Retelsdorf et al., 2012, p. 665). The authors recommended that achievement data from both Mathematics and Verbal domains, and non-achievement related outcome measures, should be the focus of future research. It is the aim of this thesis to address both of these objectives via a mixed-method research approach. It is anticipated that the data generated from the in-depth qualitative interviews will shed light on shared and unique learning, teaching, and environmental characteristics of the selective and comprehensive class and schooling contexts.

Research on Ability Grouping and Affective Outcomes

Beyond the self-concept literature, there is very little empirical research on the variable impact of ability grouping practices on non-achievement outcomes. However, as with academic achievement, the research that does exist regarding the socio-affective consequences of ability grouping for high achievers is conflicting, and it suffers many of the same methodological problems as in the academic domain.

Catsambis, Mulkey and Crain (2001) examined the social psychological influences of between-class ability grouping in Mathematics, utilising data from 9,018 eighth grade students who participated in the National Education Longitudinal Study (NELS). The authors hypothesised that high achieving students would be positively affected by a more academically challenging environment.

However, controlling for differences on prior student background characteristics, Catsambis et al. (2001) found that students in the higher achievement group had significantly more negative attitudes towards Mathematics, educational aspirations, locus of control, and engagement in school, than students in un-grouped settings. Moreover, they found that males were more negatively affected than comparable females. Catsambis et al. determined that their findings did not support the belief that segregation on the basis of academic achievement creates a socially nourishing context for high achieving students.

A two year longitudinal study in which questionnaires were administered to 943 students, 72 interviews with students were conducted, and 120 hours of classroom observation were engaged in, investigated attitudes towards Mathematics for students in grouped and un-grouped settings (Boaler, William, & Brown, 2000). Interestingly, the study followed the trajectory of a subset of students who moved from a mixed-achievement setting to homogenous achievement groups. Boaler et al. (2000) reported that 83% of students in the ability grouped settings wished to return to a mixed-achievement setting. Specifically, the study reported that the image of setting in Mathematics was one of “disaffection and polarisation” (Boaler et al., 2000, p. 642). It appeared that a number of students located in the high achievement set found it difficult to cope with the fast pace of work and the adverse pressure to consistently perform at such a high level. Moreover, students within this group reported difficulty in acquiring a deep level of understanding of Mathematics in an environment that consistently bred a faster pace of work. Also, significant numbers of students within the lower achievement sets felt they were classed as failures, who could only cope with a low level of academic work.

A qualitative study conducted by Hallam, Ireson, and Davies (2004) investigated primary school students’ experiences of between-class ability grouping practices, and the subsequent effects on their attitudes to school, self-perceptions, and behaviour. The study utilised semi-structured interviews to compare students of high, moderate, and low achievement from schools that adopted grouping practices

with those from schools that employed mixed-achievement classes. Hallam et al. reported that overall, students' perceived grouping as an effective strategy, in that work was matched to individual student needs, such that understanding was fostered and work was paced at a level commensurate with their academic capabilities.

Alongside this, better teaching and explanations, and the setting of work at a harder level, were perceived as advantages of setting. On the other hand, the negative aspects of ability grouping that were highlighted were that the work was too easy for lower achievers and too hard for some higher achievers, and there was immense pressure for those in the top academic stream. Moreover, some pupils reported preferring mixed-achievement grouping, due to the cooperative nature of the classroom and the supportive learning environment. Thus, with both positive and negative aspects of grouping practices highlighted, Hallam et al. (2004) stated that ability grouping can have negative effects on personal and social educational outcomes for some groups of students, and positive effects for others. Later research by Hallam and Ireson (2006; 2007) supported the above findings quantitatively. Ultimately, such research highlights the complexities of determining the relative impact of ability grouping for psychosocial wellbeing outcomes.

In a review of the current evidence regarding the socio-affective impact of ability grouping for GAT students, Neihart (2007) noted the lack of research available, and the dearth of sound methodological studies within the existent body of literature. A proponent of the academic benefits of ability grouping practices, Neihart's (2007) concluded overall that the current research:

does not support the claim of social or emotional benefits for such grouping arrangements. Although advantages in peer relations, motivation, career development, and attitudes toward school have been reported for some gifted students, there is evidence that heterogeneous grouping is an advantage for others as long as challenging curriculum is provided. (p. 338)

Essentially, the overarching idea emerging from the small body of research investigating the psychosocial impact of ability grouping practices is that there is not enough solid evidence from which conclusions can be drawn. More than this, it may be the case that certain educational contexts will produce benefits for some students but will be negative for others.

Implications of Ability Grouping Research for the Present Investigation

In the preceding review of the ability grouping literature, some key issues have been highlighted. Firstly, the research itself has suffered from methodological issues, such as the failure to control for individual student differences, and the lack of an appropriate comparison group. Moreover, the varying types and functions of ability grouping practices have led to conflicting findings regarding impact, in terms of benefit or detriment. Furthermore, the diverse nature of the grouping practices makes it difficult to draw any conclusions regarding selective settings within Australia. Hence, the primary goal of this research is to compare the academic achievement and wellbeing outcomes of students located in academically selective contexts versus mixed-achievement comprehensive contexts, via quantitative and qualitative means. This chapter now turns to the limited research that has specifically evaluated the selective school model.

Academic Selectivity: A Review of the Research

Academically selective schools have been in existence in NSW for over a century. However, over this extensive period of time, little research has been conducted on the effectiveness of selective schools, in terms of their capacity to achieve their goal of nurturing high achievers, and how the academic performances and broader wellbeing of students attending these schools compare with students of similar academic standard attending comprehensive schools. The fourth main section of this chapter presents the available empirical research that has investigated these issues.

Early Empirical Studies

Four early Australian studies have investigated the impact of GAT primary programs or Opportunity Classes, and selective high schools on academic achievement. Jones (1955) first investigated the effects of ability segregation by comparing high achieving Australian primary school students from a selective program with students matched on academic achievement who attended regular, mixed-achievement classes. He found no significant differences in academic persistence or subsequent Leaving Certificate scores between the two different educational settings.

However, Sampson (1969) criticised the academic achievement matching procedures utilised by Jones (1955), who matched students at the completion of Year

6: this may have overshadowed any effects from the selective program prior to Year 6. To overcome this methodological issue, Sampson (1969) matched similarly high achieving students in regular classes with students from a Year 5 and 6 selective program on the basis of gender, age, neighbourhood, and IQ scores obtained in Year 4. The findings demonstrated that the two groups did not differ significantly on subsequent Commonwealth Secondary Scholarship Examination scores (a standardised test to gain a secondary school scholarship), Year 12 HSC scores (state-wide examinations at the final stage of high school), or persistence at school.

In the first research study, based on data collected from NSW selective high school students, Sampson (1977) compared the academic performance of students matched on gender, age, socioeconomic status, IQ, and prior academic achievement in selective and comprehensive high schools at the completion of six years of secondary education. The findings appeared as part of the 1977 Macdonald Report to phase out NSW selective schools (detailed in Chapter 2). Sampson (1977) found that there were no statistically significant differences between the selective and comprehensive high school students on Year 10 School Certificate scores (state-wide school examinations to assess knowledge for senior secondary years) or Year 12 HSC scores.

Furthermore, MacCann (1984) conducted a study to examine whether 852 students at seven NSW selective high schools performed better on the HSC examination than would be expected on the basis of their IQs. The results demonstrated that only students with an IQ greater than 130 (146 students, 17% of the sample) performed significantly better on the HSC than would have been predicted on the basis of their IQ. For the remaining 706 students within the selective school sample, there was no significant difference between their performance on the HSC examination and what would be expected on the basis of their IQs. Thus, MacCann concluded that academically selective schools only produced achievement benefits for the minority sample of exceptionally academically able students. Due to the lack of a comparative sample of high achieving students from comprehensive schools however, it could not be determined whether a similar or different outcome would be found for those located within mixed-achievement educational settings. Despite this, the findings from each of the four early empirical research studies cited above support the conclusion that there is little benefit of academically selective schools for enhancing high achievers' academic outcomes.

More Recent Empirical Studies

Later research on the impact of selective schooling for students' academic and psychosocial wellbeing is also sparse. Braithwaite and Kensell (1995) conducted a mixed-method evaluation of the perceptions of 137 Year 12 students enrolled in four NSW selective high schools from 1989 to 1990, of the effectiveness and quality of the education they received. This research was the first of its kind on NSW selective schools to be permitted since the implementation of major structural changes to the provision of education in 1988 (detailed in the previous chapter), which saw the number of selective schools in NSW more than double. Firstly, when asked if they had performed in the HSC as well as they had anticipated, 67% of the sample reported the perception that they did not achieve as well as they had hoped, even though the students within the sample obtained high mean HSC marks. Hence, these students predominantly reported more negative perceptions of their academic achievements, in contrast to their actual academic capabilities.

Secondly, whilst most students were satisfied with how their school had prepared them for life along academic and social dimensions, the majority of students did not perceive that the selective environment had prepared them for life along cultural, sporting, and community awareness dimensions. The current educational status of the selective student sample was also examined. During the first year following high school, 79% of the students indicated that they were studying full-time in the tertiary sector at university, a significantly higher proportion compared with the overall Australian population of students at the same age (Braithwaite & Kensell, 1995).

Moreover, the students in the Braithwaite and Kensell study (1995) were also asked an open-ended question about what they liked most and least about the selective environment. Selective students indicated that they most valued: working with like-minded students; the teachers, whom they perceived as dedicated and encouraging of their achievement; and the presence of healthy competition. Conversely, students felt the most negative aspects of the selective environment were the unhealthy competition and academic pressure, which culminated in "extreme stress and tears" (Braithwaite & Kensell, 1995, p. 137), that teachers were not specifically selected for their position, and the presence of low self-esteem amongst students. It was apparent that the positive and negative aspects identified tended to

mirror each other, and the issue of competition generated the most debate as to its adaptive or maladaptive role.

It was concluded that “overall, it would appear that the provision of selective high schools for GAT students appears to be beneficial for this sample of students” (Braithwaite & Kensell, 1995, p. 135). Indeed, what Braithwaite and Kensell’s (1995) findings seem to support is the notion that selective settings may be suited to some, but not all academic high achievers. However, the implications of Braithwaite and Kensell’s study are limited, due to the lack of an appropriate comparison group of students within the comprehensive school setting. Moreover, the quantitative component of the study relied on single items to measure constructs, rather than on psychometrically sound instruments, and analysed the responses in terms of basic percentages: this led to a descriptive presentation of findings that is not an adequate base from which to draw solid conclusions regarding educational policy.

A study by Chan (1996) compared 143 NSW selective high school students in Year 7 with 133 average achieving age peers from local comprehensive schools on motivational orientations and metacognitive abilities. The results showed that in comparison to the average achieving comprehensive students, the selective school students perceived they had greater competence in reading, more personal control over their success and failures in school tasks, and demonstrated more knowledge of learning strategies. However, the fact that no academic achievement scores were collected means that the pre-existing and large achievement differences between the two samples could not be controlled for. As such, these findings must be interpreted with caution.

Furthermore, Gross (1997) compared Year 7 students from nine academically selective high schools with a cross-section of mixed-achievement Year 7 students in comprehensive high schools on facets of academic and non-academic (Social, Family, and General) self-concept, measured at three time points throughout the school year. As with Chan (1997), some methodological issues with the study limit the validity of the findings and their implications. Specifically, the selective and comprehensive students were not matched on any background variables and no achievement scores were collected; thus, it failed to account for the substantially higher academic achievement level of the selective sample compared to the comprehensive sample. Gross (1997) concluded that students in selective and

comprehensive schools reported a similar decline in their academic self-concepts across the school year.

Moreover, the Social, Family, and General facets of self-concept rose significantly for both groups, with the selective school students rating significantly higher than the comprehensive group on all three facets. However, Marsh and Craven (1998) subsequently reanalysed these data and demonstrated that Gross's (1997) findings showed: (i) a significant decline in academic self-concept for the selective school students, and an increase for comprehensive students across the school year; (ii) no significant differences between the groups on Social self-concept; (iii) whilst selective students had higher Parental Relations self-concepts at the start of the year, the two groups were statistically similar by Time 3; and iv) for General self-concepts, both groups experienced increases across the year, but the increase was significantly greater for comprehensive students. Ultimately then, Gross's study supports the BFLPE for academic self-concept within NSW selective schools, and furthermore shows that shifts over time for non-academic facets of Social, Family, and General self-concept tend to positively favour the comprehensive school group.

Moreover, in the Craven et al. (2000) study previously outlined, in which high achieving primary school students located in three differing educational settings (a regional GAT program, mixed-achievement classes and streamed classes within schools) were compared, the supposed benefits of academic selectivity were not supported. Controlling for pre-existing differences between the three groups, students in the specialised GAT program had lower Reading, Mathematics, Science, School, General, Physical Appearance, and Peer self-concepts, and lower adaptive motivational orientations compared to the students who experienced the streamed or mixed-achievement environments. Additionally, there were no differences between the three groups in terms of academic achievement across the school year. This led Craven et al. to conclude that their empirical research did not support the intended outcomes of academically selective programs in improving the self-concept, adaptive motivational orientations, and academic outcomes of high achievers in comparison with alternative educational environments.

The rationale for the grouping of students of a similar academic standard together in specialised schools is based on the argument that it facilitates an increase in achievement levels. However, Ireson and Hallam's (2001) review of UK and wider international empirical research found that evidence regarding the link

between selective schooling and achievement was mixed, with some studies showing an advantage in examination results, while others found no difference. Moreover, Ireson and Hallam warned that the initial academic achievement level of the students was often not taken into account, and noted that when it was controlled for “the differences between unselective and selective systems are reduced and in some cases disappear” (p. 25). Furthermore, they found that the evidence of the impact of selective schools on student wellbeing outcomes, specifically on self-concept and emotional responses to schooling, was clear: students had lower self-concepts and less positive attitudes towards the school as a whole, and structured ability grouping had a negative effect on the self-concepts of more-able students.

A recent study conducted by Robert (2010) utilised PISA 2006 data and concluded that selectivity in school admittance based on pupil academic performance was linked to a higher level of scholastic achievement. Specifically, Robert compared a myriad of educational settings (government public schools, private schools, academically and vocationally-tracked systems, ability grouped schools, and academically selective schools) on student attainment in standardised Mathematics, Reading and Science tests. He reported that an academically selective environment was the strongest predictor of achievement in Mathematics and Science, and was the second strongest predictor of Reading achievement, second to the academically oriented tracking schools. However, as Robert failed to account for prior individual achievement levels, the study did not control for pre-existing differences between the non-equivalent groups in terms of student performance. Hence, the results are not surprising, considering the already high achievement levels of students attending academically selective schools.

Implications of the Selective School Research for the Present Investigation

In light of the paucity of research data . . . there is certainly a need to conduct comprehensive longitudinal research projects that examine the academically affective variables and their relationship to achievement outcomes. Ideally, longitudinal research should be conducted comparing this type of provision with a matched group of equally able students who attended a comprehensive school. No studies have been completed as yet.

(Dixon & Gow, 1993, p. 7)

Dixon and Gow’s (1993) call for research, cited above, is as relevant today as it was 21 years ago. In the Australian and international context, there has been a

paucity of studies that directly examine the effects of segregated schools in comparison to mixed-achievement settings for academic high achievers. Of the studies that have been conducted, methodological and conceptual limitations inherent within the research limit the conclusions that can be drawn from them. Also, the methods and groups utilised as comparisons within each study, and the variables that are controlled for, vary significantly between studies. Moreover, most of the research, including that on ability grouping more generally, has focused solely on academic achievement and self-concept outcomes, with little investigation of other affective outcomes that are important for students' health and wellbeing.

For such reasons, the question of the effectiveness of academic segregation remains muddled. Research conducted by Jones (1955) and Sampson (1969; 1977) considered only academic achievement scores and is particularly out-dated. Chan (1996) and Gross (1997) did not statistically control for prior differences in academic achievement between their selective and comprehensive samples of students. The Braithwaite and Kensell (1995) study did not consider students from educational settings other than selective schools, so no comparisons can be made. Moreover, most studies that have evaluated the impact of selective settings have typically focused on academic self-concept, while a few other studies have examined educationally oriented variables such as career aspirations. Moreover, few studies have qualitatively examined students' direct experiences of these settings.

Hence, the present study is the first to critically evaluate the differential impact of NSW academically selective schools and mixed-achievement comprehensive schools on high achievers' academic results and an array of psychosocial outcomes that are crucial to these students achieving their best life potential. Whether or not selective high schools can be effective providers for academic high achievers has never been adequately evaluated. The limited, relevant research available has tended to indicate that this type of educational provision may well have an unforeseen negative impact in dampening, rather than enhancing academic self-concept for a number of students. The discussion now turns to consideration of the psychosocial matters included in the present investigation.

Beyond Academic Achievement and Self-Concept: Selective Schooling and Other Psychosocial Outcomes

Predominantly, the literature and research on selective schooling and ability grouping has focused on impacts on academic achievement and academic self-concept outcomes. The present research extends the empirical research by examining the effects of differing schooling settings on a select set of vital wellbeing outcomes, including academic buoyancy, parental relationships, pressure to achieve, depression, and anxiety. Moreover, the predictive relations between each of these constructs and academic achievement are investigated for consistency across the differing school settings. As such, this fifth main section gives a very brief orientation to each of the constructs, highlighting their importance for school success, examines previous research on their relation to academic achievement and also research from the GAT literature relating to these constructs.

Academic Buoyancy

Academic buoyancy, a recently developed construct, is defined as “a student’s ability to successfully deal with academic setbacks and challenges that are typical of the ordinary course of school life (e.g., poor grades, competing deadlines, exam pressure, difficult school work)” (Martin & Marsh, 2008a, p. 54). Academic buoyancy is related to minor adversity, and has been distinguished from academic resilience by Martin and Marsh (2008a; 2008b): the latter refers to the capacity to overcome acute and chronic adversities (i.e., major adversities) that are viewed as a significant threat to students’ academic development. Findings based on a study conducted with 918 Australian high school students showed that academic buoyancy negatively predicted outcomes that impede student engagement, such as anxiety, working to avoid failure, and uncertainty about how to do well (Martin, 2013). Longitudinal research has also demonstrated that students who are the most academically buoyant obtain the highest academic grades (Barnett, 2012). Hence, academic buoyancy is an integral component of academic success.

The construct of academic buoyancy has yet to be investigated in the context of the GAT literature. Also, academic resilience research has tended to focus on ethnic groups located in adverse conditions, on chronic underachievers, and on those faced with learning disabilities (e.g., Finn & Rock, 1997). Moreover, little research has been undertaken to examine the differential effects that selective and mixed-achievement educational settings may have on this important student variable. Due to

the importance of the academic buoyancy construct in producing academic success, it was the aim of the present thesis to investigate academic buoyancy both quantitatively and qualitatively in terms of: (i) how Mathematics and English academic buoyancy may be differentially impacted by differing school settings (i.e., selective and comprehensive); and (ii) how Mathematics and English academic buoyancy relates to academic achievement, and whether the relation is similar or different for students located in diverse school settings.

Parental Relationships

Positive relationships with parents, arguably, are an integral ingredient in the development of well-rounded adolescents, and in promoting desirable educational, health, and behavioural outcomes. For example, positive parent-child relationships have been linked with better mental health and lower rates of delinquency (Hair, Moore, Garrett, Ling, & Cleveland, 2008), higher achievement, and fewer behavioural and learning problems at school (Gaylord-Harden, 2008). Furthermore, McNeal (1999) found that parental involvement functions as a form of social capital, and that quality parent-child communications are related to higher Science achievement. Limited research has been conducted in relation to the impact of selective versus mixed-achievement settings on relations with parents, and the outcomes of this research have been mixed.

Craven et al. (2000) compared high achieving Australian primary school students placed in a regional selective GAT program, with high achieving students educated in mixed-achievement and streamed classes within schools, and found no significant differences between these groups in terms of Parental Relations self-concept. Marsh and Craven (1998) analysed data comparing Year 7 students from nine academically selective high schools with a cross-section of mixed-achievement Year 7 students in comprehensive high schools, and showed that whilst selective students had higher Parental Relations self-concepts at the start of the year, the two groups were statistically similar by Time 3. Due to the lack of consistency in the small body of research that does exist, it was the aim of the present thesis to investigate parental relationships both quantitatively and qualitatively in terms of: (i) how Parental Relations self-concept may be differentially impacted by differing school settings (i.e., selective or comprehensive); and (ii) how Parental Relations self-concept relates to academic achievement, and whether the relation is similar to or different for students located in diverse school settings.

Pressure to Achieve

The pressure from significant others such as parents and teachers, to succeed academically, has been shown to have varied effects on student outcomes within the literature. For example, pressure to succeed from significant others was found to have a detrimental effect on student achievement (Campbell & Mandel, 1990; Campbell & Wu, 1994; Levpušček & Zupančič, 2009), and wellbeing (Rogers Theule, Ryan, Adams, & Keating 2009; Stoeber & Rambow, 2007). A study conducted by Cho and Yoon (2005) showed that the more pressure the family placed on gifted students, the more these children were reported to display distractibility, aggressiveness, helplessness, and emotional problems. However, not all research has demonstrated negative associations between pressure and student outcomes. For example, Kim and Park (2006) found that parental expectation and pressure had a positive effect on academic achievement. However, no research has investigated pressure from parents in selective versus mixed-achievement comprehensive settings. Furthermore, the existent literature regarding parental expectations from a GAT standpoint reveals that pressure from parents may, in fact, be culturally bound, as opposed to being a schooling context issue. This issue will be explored in more depth in the final section of this literature review.

In an extensive review of the literature considering more than 500,000 studies spanning teaching and learning, Hattie (2003) concluded that apart from the student themselves, teachers account for the next most important amount of variance in explaining students' academic success: "it is what teachers know, do, and care about which is very powerful in this learning equation" (p. 4). Furthermore, research has identified that teachers who are passionate about their students' learning and achievement, hold high expectations for their students, challenge their learning, and set high standards for work, help to produce the most positive outcomes not only for high achievers, but for students of all levels of achievement (Hattie, 2003; Ford & Trotman, 2001).

Hence, the extent to which students experience pressure from their teachers to achieve, and furthermore, perceive it as a positive or negative influence, may be critical to their academic and wellbeing outcomes. The construct of teacher pressure to achieve has yet to be examined from a high achievement context. Thus, it was the aim of the present thesis to investigate pressure to achieve from significant others both quantitatively and qualitatively in terms of: (i) how Parent and Teacher pressure

to achieve may be differentially experienced by students in differing school settings (i.e., selective and comprehensive); and (ii) how Parent and Teacher pressure to achieve relates to academic achievement, and whether the relation is similar or different for students located in diverse school settings.

Depression and Anxiety

Extensive research has documented that whilst good mental health is linked with school success (Puskar & Bernardo, 2007; Sznitman, Reisel, & Romer, 2011), poor mental health is associated with increased risk of later major depression, anxiety disorders, nicotine dependence, alcohol dependence, suicide attempts, educational underachievement, unemployment, homelessness, increased risk of incarceration, and misuse of drugs (Fergusson & Woodward, 2002). Of relevance to the present investigation, there exists a perception that high academic achievers are more susceptible to mental disorders than their peers achieving at lower levels (Martin, Burns, & Schonlau, 2010). However, the research on this itself is mixed, with some studies supporting this popular notion (e.g., Gallagher, 1990), and others arguing that high achievers are at lower risk of mental and emotional problems (Neihart, 1999).

As Martin et al. (2010) note, “as the field of giftedness evolves, literature continues to be published to support both views” (p. 32), thus making it challenging to rectify these disparate findings. Furthermore, Martin et al.’s recent comprehensive meta-analysis of the research to date comparing the depressive and anxious tendencies of gifted versus non-gifted students found only nine studies that the authors believed to be theoretically and methodologically sound. The authors concluded that overall, studies suggest that gifted youth have either the same or lower risk of depression and anxiety as lower achieving peers.

Similarly, Zeidner and Shani-Zinovich’s (2011) comparison of academically gifted and non-gifted students found that gifted students scored lower on state anxiety constructs and were not reliably different from their non-gifted peers on mental distress or subjective wellbeing. Hence, the most recent research may suggest that when gifted students are compared to non-gifted students on various socio-emotional outcomes, “the results are not unfavourable to gifted students” (Zeidner & Shani-Zinovich, 2011, p. 566).

With regard to the debate surrounding selective and comprehensive school settings and their respective effects on student mental health, it is difficult to draw sound conclusions from the existing literature. The present thesis examines the

mental health of students (measured via Depression and Anxiety) both quantitatively and qualitatively in terms of: (i) how mental health may be differentially impacted by differing school settings (i.e., selective and comprehensive); and (ii) how mental health relates to academic achievement, and whether the relation is similar or different for students located in diverse school settings.

This literature review now proceeds to the final section, which gives a brief discussion of the integral role of cultural background in the school success of high achieving students.

The Influential Role of Cultural Background

Even when Western parents think they're being strict, they usually don't come close to being Chinese mothers. For example, my Western friends who consider themselves strict make their children practice their instruments 30 minutes every day. An hour at most. For a Chinese mother, the first hour is the easy part. It's hours two and three that get tough.

(Chua, 2011, p. 4)

Amy Chua's (2011) memoir outlines the author's account of what she describes as traditional Asian cultural values and parenting practices to drive her children's academic success, including the use of minimal leisure time and non-academic socialising, strict sanctions for any grades less than excellent, and intense academic lessons. Chua's book, and her notion of what has been termed the 'tiger mother', has generated intense discussion and debate in the popular media, thrusting parenting in Asian-heritage families into the limelight. Debate centres particularly upon the existence, prevalence, and impact of tiger parenting. It seems that "this stereotypical, caricature-like image seems to confirm the worst fears about Asian parenting—that it is excessively controlling, harsh, and demanding unquestioning obedience with little to no concern for the child's needs, wishes, or emotional wellbeing" (Juang, Qin, & Park, 2013, p. 1).

Not since Chao's (1994) ground breaking study, which called into question the application of traditional, Western conceptualisations of parenting styles to Asian-heritage families (encompassing both Asian American and native Asians within the literature; Juang et al., 2013), have the culture-specific aspects of parenting that may be unique to this cultural grouping featured so prominently in the research sphere. Indeed, this notion of the tiger mother has created a challenge, the

need for a systematic examination of the literature, and impelled a new wave of research that attempts to provide a more nuanced and culturally embedded understanding of Asian-heritage parenting.

In the present study, something that emerged unexpectedly from the qualitative data is that some students revealed that the cultural composition of their backgrounds, and the interconnected influence of their parents were key factors in their academic success and psychosocial wellbeing. Hence, cultural heritage raised an important contextual factor to be considered alongside the achievement composition of the student body, when evaluating student outcomes. These students self-identified as being of “Asian” cultural heritage. Indeed, government-collated demographic data confirms that academically selective schools in NSW embrace, in almost all cases, students from a language background other than English, and that Asian-heritage backgrounds predominate (Australian Curriculum, Assessment and Reporting Authority, 2013; Ho, 2011).

Moreover, the demographic data specific to the present investigation indicates that overwhelmingly, the predominant Asian region nominated by students as representing their cultural heritage was Northeast Asia, inclusive of Chinese Asia, Japan, and the Koreas. This classification was based on the Standard Australian Classification of Countries (SACC) developed by the Australian Bureau of Statistics (ABS; 2008), which groups together countries that share similarities in social, political, cultural, and economic characteristics. More detail on this is provided in Chapter 5.

Within the literature itself, research has predominantly focused on Chinese American heritage families, while a few have considered Korean American heritage families, with the literature collectively and broadly terming this “East Asian” or “Confucian Asian” culture (House, Hanges, Javidan, Dorfman, & Gupta, 2004; Juang et al., 2013). Of course, it must be recognised that there are many problems inherent in utilising such a broad and generalised classification scheme that ultimately ignores the many considerable within-group differences, and nuances that are not shared across the grouped regions. Acknowledging this issue, which is further elucidated in following sections, and in line with the terminology adopted within the literature, this classification scheme is employed to provide a basic framework for discussion.

The following sub-sections briefly consider the literature regarding Asian-heritage academic achievement, culturally embedded values, culture-specific aspects of parenting, and their resultant impacts on student academic achievement and wellbeing outcomes. In this discussion, the theoretical, conceptual, and methodological problems inherent in this body of research are highlighted.

Asian Background and Higher Achievement

Numerous research studies have documented the school success of Asian background students in terms of their superior academic and occupational attainments compared to their Anglo-background counterparts (Kim & Chun, 1994; Patton & Royer, 2009; Steinberg, Elmen, & Mounts, 1989). Flynn (1991) found that students of Asian heritage typically achieve at higher levels than European heritage students with the same IQs. Extensive US research has found that Asian American students have higher SAT scores, higher grade point averages, and are over-represented among national competition prize winners, in secondary school and university graduation rates, and acceptance to prestigious universities (Caplan, Choy, & Whitmore, 1992; Kim & Chun, 1994). Moreover, there is considerable support for high levels of educational attainment amongst Asian background students in Australia, who typically obtain higher academic grades, spend more time studying, and are more likely to obtain an occupation requiring tertiary qualifications than Anglo-Australian peers with the same IQ (Dandy & Nettlebeck, 2002).

Findings from the most recent international PISA 2012 study, which tested more than 510,000 students in 65 countries and economies, showed that East Asian countries outperform the rest of the world in the domains of Mathematics and Science in particular (Organisation for Economic Cooperation and Development, 2014). Students in Shanghai, China scored a level equivalent to nearly three years of schooling above most other OECD countries in Mathematics. In relation to Reading, East Asian countries also performed well but the achievement gap was smaller, with many more European countries being represented amongst the top performers than was the case with Mathematics and Science (Organisation for Economic Cooperation and Development, 2014). A possible explanation for this may lie in the pedagogical practices of these Asian regions, which tend to emphasise strategies of repetitive effort, memorisation, and drill (Huang & Leung, 2005; Mok, 2006; Watkins & Biggs, 2001). These rote-learning tools may produce exceptional outcomes for subjects such as Mathematics, where principles and formulae can be memorised and

only one answer is correct. However, in the case of more subjective areas, such as Reading literacy, which requires a more creative generation of responses and where multiple answers may be correct, such strategies may not be so conducive to success.

Overall however, what explains the greater academic achievement of Asian background students compared to their Anglo-background counterparts? The next sub-sections attempt to provide answers to this question, beginning with cultural and sociological values.

Cultural and Sociological Values

Throughout the literature, key cultural values that may be shared by some families of East Asian heritage, and that may be integral to understanding the approach to education adopted by some within this cultural group, are highlighted. From the outset, it is important to emphasise that such values need not be representative of all individuals of East Asian heritage; largely, they have been gathered on the basis of data collected from Chinese American and native Chinese families.

That notwithstanding, there is a documented history of East Asian culture highly valuing learning and education, as the primary avenue for life success, emphasising effort above ability to achieve academically, and stressing hard work, discipline, and respect for family and authority (Nagasawa & Espinoza, 1992). Cross-cultural research in which Chinese heritage American families have been compared with European American heritage families has shown that the former tend to have higher expectations and performance standards, and higher educational and career aspirations for their children than any other cultural group (Chen & Stevenson, 1989; Huang & Leung, 2005). Simultaneously, the collectivist nature of this culture highlights the importance of family closeness and social harmony (Stankov, 2010). There is a strong emphasis on the need to fulfil familial obligations and to repay parental sacrifices (Sue & Okazaki, 1990).

In Confucian philosophy, filial piety, defined as upholding honour and respect for one's family, obeying parents' choices and wishes, and caring for parents even after their deaths, is one of the most closely held cultural virtues (Pan, Gauvain, & Schwartz, 2013). For some families of East Asian culture, it is considered appropriate and positive for children to feel a sense of indebtedness towards their parents for their sacrifice and support; this in turn promotes filial piety and academic success (Kim & Park, 2006). Hence, it appears that some individuals may strive to

attain success not only for their personal advancement, but just as importantly, for the honour of their family and their wider social standing (Huang & Leung, 2005; Mok, 2006; Watkins & Biggs, 2001). East Asian cultural values hold that the self and one's family are inextricably linked, such that one's own achievement is also perceived as a family achievement. Accordingly, some Asian heritage students are highly cognisant of, and learn to sincerely consider the implications and consequences that arise from, their academic achievements and failures (Stankov, 2010). The combination of these elements may be a driver of academic success for those students who experience these values.

It has also been shown that some family units of Asian heritage exert immense pressure on children and adolescents to invest effort in academic avenues more so than in other cultural groups (Stankov, 2010, Woo et al., 2004). This is said to reflect the traditional cultural belief that hard work and effort will be rewarded with success (Sue & Okazaki, 1990). Research suggests that generally, parents of Asian heritage emphasise effort, discipline, and self-regulation above innate ability, whilst European heritage parents are more likely to assume that if a child does not achieve to a desired standard it is rather due to a lack of innate ability (Huang & Leung, 2005; Kim & Park, 2006; Mok, 2006; Stevenson et al., 1990). Educational psychology research has demonstrated that there are indeed meaningful differences between some Asian background and European background students in terms of their exertion of effort in, and motivation for studying, with the former group reporting higher levels on both constructs (Huang & Leung, 2005; Stankov, 2010; Mok, 2006; Watkins & Biggs, 2001).

The theory of relative functionalism may also aid in the explanation of high academic attainments for certain students of East Asian heritage (Sue & Okazaki, 1990). Sue and Okazaki (1990) maintain that the academic success of some Asian students cannot be solely attributed to cultural values, and that explanations must also include the implications resulting from their historical standing and experience within society. The concept of relative functionalism holds that the educational attainments of some Asian background students may be influenced by the prospects of upward mobility, via either educational or non-educational avenues. Specifically, it considers the problems of attaining academic success through non-educational means: that is, in those domains that are not a clear and direct outcome of educational performance, and where educational attainment is not directly linked to a

desired position, such as one in entertainment, sport, politics, and leadership. Some families of Asian heritage have previously perceived or experienced restrictions in upward mobility in careers or jobs that are unrelated to education. Hence, the relative value or function of education as an avenue to achieving success has increased, and education has become more salient, as the primary functional means of achieving higher economic and social status relative to other, non-educational alternatives.

In support of this, Kim and Park's (2006) review of cross-cultural research examining the high educational achievement of Korean students found that for the samples studied, education was viewed as an integral part of self-cultivation, as the primary way to achieve personal, familial, social, and career success, and as the single most important life goal. Hence, it may be that cultural values and practices, alongside experiences in society and the functional emphasis on education, are all important factors in explaining the academic success of certain students of Asian heritage. Not surprisingly, the culture-specific aspects of parenting that may be unique to Asian-heritage families have garnered considerable attention in the literature.

Asian-heritage Parenting: What the Research Says

According to Chua's (2011) memoir, an excerpt of which is presented at the beginning of this main section, Asian-heritage mothers ("tiger mothers") are highly controlling, authoritarian, and deny their children free time, social activities, and extracurricular activities, in order to push them to high levels of academic attainments at all costs. This construction of Asian parents also seems to encapsulate the stereotypical viewpoint that is commonly held within the media and that is represented throughout public discourse. In the scholarly literature, researchers have prolifically studied elements of parenting in Asian-heritage families.

The overwhelming majority of these studies have utilised only quantitative methods based on cross-sectional data, used European Americans as a comparison group, and applied Baumrind's (1966) Western typology of authoritarian and authoritative parenting styles. Studies have generally reported that Asian-heritage parents are more authoritarian, compared to European American parents who are more authoritative (Chao, 2001; Liew, Kwok, Chang, Chang, & Yeh, 2014; Park, Kim, Chiang, & Ju, 2010; Pong, Hao, & Gardner, 2005); they tend to support higher levels of psychological control, strictness, and demandingness (Chao & Aque, 2009); are less permissive (Chao, 2001); express less parental warmth, external affection,

emotion, and verbal expressions of love (Eisenberg, Chang, Ma, & Huang, 2009; Wu & Chao, 2005); more strongly stress filial piety (i.e., honouring family, respecting elders, and being the best student; Chao, 2001), obedience, and regard for parents (Supple & Small, 2006); and place less importance on autonomy (Supple, Ghazarian, Peterson, & Bush, 2009). On appearance then, some Asian-heritage parents may differentially endorse beliefs and values regarding control, and adopt different parenting practices along various dimensions, compared to European American parents.

Moreover, research with predominantly Western students has linked the use of practices said to be employed by Asian-heritage parents with more negative developmental outcomes, such as lower levels of self-control, more emotional problems, and lower academic performance (Eisenberg et al., 2001; Lamborn, Mounts, Steinberg, & Dornbusch, 1991; Steinberg, Dornbusch & Brown, 1992; Steinberg, Lamborn, Dornbusch, & Darling, 1992). The same body of research has shown that European American practices are conducive to more positive developmental outcomes, including higher academic achievement, school grades, school engagement, psychosocial adjustment and competence, social development, self-perceptions, and mental health (Collins, Madsen, & Susman-Stillman, 2002; Lamborn et al., 1991; Pong, Johnston, & Chen, 2010; Steinberg, Dornbusch, et al., 1992).

As Juang et al. (2013) outline, one advantage of the dominant approach of investigating Asian background parenting (i.e., quantitative methods based on cross-sectional data, European Americans as a comparison group, and Baumrind's [1966] typology of parenting styles), is that it offers a clear understanding of what is distinctive to and what may be common across different ethnic groups. However, one significant disadvantage of this research approach is that it fails to account for variations within Asian parenting across cultural groups, time, and contexts, or to adequately consider culturally specific approaches to parenting (Juang et al., 2013). Indeed, a number of problems are inherent within this comparative approach. Firstly, most studies have principally sampled Chinese American families and Korean American families. Moreover, few studies have considered families of Southeast Asian-heritage, or modern-day Asian families that have been located within Western countries such as the United States or Australia for generations.

Secondly, the majority of studies have employed a quantitative research method, giving little attention to qualitative tools that could bring about a deeper and more nuanced understanding of specific Asian-heritage parenting practices. Thirdly, most research has compared Asian American families to European American families, with little focus on the unique within-group differences of these broad groupings. Lastly, the notion of the “model minority” Asian student as the exceptional academic achiever has dominated the research landscape, leading to theory and empirical research almost solely focusing on educational achievement as an outcome. Hence, the impact of parenting styles and practices on the psychological, social, and emotional wellbeing of students has principally been ignored.

Chao’s (1994) research was one of the first studies to demonstrate that the typical application of Baumrind’s (1966) classification of parenting styles to Asian background parenting studies may not be the most appropriate methodology. Chao outlined that for certain Asian-heritage families, the Confucian concepts of *guǎn* (“safeguarding”) and *jiào xun* (“demandingness of excellence”) may more accurately capture some of the culture-specific aspects of parenting (Chao, 1994, 2001; Liew et al., 2014). *Guǎn*, meaning “to govern” and “look after” describes the parental duty of fulfilling children’s needs and safeguarding their wellbeing (Tobin, Wu, & Davidson, 1989). *Jiào xun*, meaning “to train or teach” refers to the parental duty of demanding excellence from children (Chao, 1994). It is argued that these cultural concepts of *guǎn* and *jiào xun*, which encapsulate the safeguarding of children and the demandingness of excellence, may be a more accurate description of parenting practices for some Asian-heritage parents than in traditional Western definitions.

A more recent body of research that was in fact driven by Chua’s (2011) memoir, has laid claim to a more complex and representative understanding of Asian background parenting practices (e.g., Chea, Leung, & Zhou, 2013; Choi, Kim, Kim, & Park, 2013; Kim, Wang, Orozco-Lapray, Shen, & Murtuza, 2013; Lamborn, Nguyen, & Bocanegra, 2013). Collecting data from a diverse array of Asian-heritage cultures including Mainland Chinese, American Chinese, Korean American, and Hmong American, adopting both quantitative and qualitative methods, and specifically investigating within-group differences, this contemporary research has attempted to overcome the limitations of past research.

Supple and Cavanaugh's (2013) findings, based on Hmong American parents and their adolescent children, found that parental monitoring (an integral aspect of tiger parenting) is a culturally appropriate and positive parenting practice that conveys concern and support to Hmong adolescents. Furthermore, Lamborn et al. (2013) found that although the same parenting behaviours that are said to define tiger parenting (that is, using high expectations to fulfil family obligations and close supervision in training children) were present in their sample of low socioeconomic status Hmong mothers, they may have had a different basis to those found with middle and upper socioeconomic status Chinese American families, which have been the predominant focus in the literature. Hence, not only the importance of cultural values that shape parenting beliefs, practices, and subsequent child outcomes, but also the weight of family resources, and social and economic factors, were highlighted.

Utilising a three-wave longitudinal design across eight years, from early adolescence to adulthood, Kim et al. (2013) studied adolescents, fathers and mothers from 444 Chinese American families. Latent profile analysis revealed the operation of four parenting profiles within the sample: supportive, easy going, tiger, and harsh. The authors found that the most prevalent parenting style was supportive: this scored relatively highly on the positive parenting dimensions of parental warmth, inductive reasoning, parental monitoring, and democratic parenting, and relatively low on the negative parenting dimensions of parental hostility, psychological control, shaming, and punitive parenting. This profile is akin to the classic authoritative parenting style operationalised by Baumrind (1966), which is high in parental warmth and positive control.

The next most prevalent parenting style was tiger parenting, which scored relatively high on both the positive and negative parenting dimensions. The least prevalent style of parenting was harsh, which closely identifies with Baumrind's (1966) authoritative parenting style, which is low on parental warmth and high on negative control. Moreover, it was found that supportive parenting was linked with the most positive developmental outcomes, including a higher GPA and educational attainment, lower levels of academic pressure, depressive symptoms, and feelings of alienation from parents, and a stronger sense of family obligation. Tiger parenting on the other hand did not result in the best educational attainment, and was associated with high academic pressure.

The implications from Kim et al.'s (2013) study then, are threefold. Firstly, the findings indicated that traditional, dichotomous classifications of parenting styles that previously have been applied to Asian-heritage parenting research, might not adequately capture the true nature of culture-specific aspects of parenting. Secondly, contrary to the common perception, tiger parenting was not the most typical parenting profile, and was defined both by positive and negative parenting aspects. Thirdly, tiger parenting does not lead to optimal adjustment among Chinese adolescents. Ultimately, it seems that although the importance of parental beliefs and practices for students' academic and wellbeing outcomes is not disputed, there exist two separate commentaries regarding the adaptive or maladaptive nature of this role.

Considering Psychological Health and Well-Being

Although the academic success of Asian background students is well documented, empirical attention to the psychosocial wellbeing of these students has often been neglected (Juang et al., 2013; Sung, 2010). Research based on the large-scale PISA 2003 data has found significant differences between the top performing four East Asian and five European countries on self-reported, domain-specific measures of test anxiety, self-efficacy, and self-concept in Mathematics (Lee, 2009). More specifically, students of an Asian background were found to be significantly more anxious and reported significantly lower self-efficacy and self-perceptions of their academic capabilities than did students of a European background. The effect sizes for the differences between these two regions were .50 for anxiety, .52 for self-efficacy, and .38 for self-concept: this indicates the magnitude and practical importance of these differences.

Furthermore, Stankov (2010) outlines that the differences on self-efficacy and anxiety are five to seven times larger than the differences on achievement between these two regions. Wilkins' (2004) findings, based on the Trends in International Mathematics and Science Study (TIIMS), also found that Asian background students possessed significantly lower self-concepts than their European counterparts, with Japan, South Korea, and Hong Kong China reporting the most negative self-perceptions of all countries involved in the study.

In attempting to explain these broad between-group differences, the literature has reported that some Asian heritage families may be more unforgiving towards underachievement and misbehaviours, compared to other parts of the world (Hook et al., 2013; Neff, Pisitsungkagarn, & Hsieh, 2008; Stankov & Lee, 2008; 2009).

Moreover, immense familial and societal pressure to achieve academic success is placed on some students. Alongside this, some Asian-heritage families have reported a strong emphasis on effort, and the belief that one's academic successes and failures are a direct result of personal discipline, rather than being due to external factors or to ability. For students who experience these elements of Asian-heritage parenting, the resultant effect may be more negative social, emotional, and psychological health outcomes.

However, these broad studies have failed to consider within-group nuances, which could provide a more complex understanding of the social and emotional development of certain Asian background students. Qin's (2008) study with Chinese Americans is important because it showed that features of tiger parenting, such as excessively high academic expectations, pressure to achieve, absence of open parent-child communication and high strictness, may lead to academic success at school, but also to less positive outcomes in social or emotional areas.

Indeed, Supple and Cavanaugh (2013) found that certain aspects of tiger parenting, such as high parental monitoring, could promote some areas of development (academic achievement) better than others (experiences of parental disapproval, self-concept). Conversely, Kim et al.'s (2013) research (as previously outlined) shows that the most common parenting style utilised within a sample of Chinese American families (that is, supportive) evinced widespread, positive adolescent development outcomes. As Juang et al. (2013) highlight, "only when academic outcomes are studied in conjunction with socio-emotional outcomes simultaneously can we begin to discern whether or not there are important trade-offs associated with certain parenting practices" (p. 4). It is the aim of the present research to shed further light on this issue.

Implications of Cultural Background Research for the Present Investigation

During the collection of qualitative data for the present investigation, the students participating in the focus group interviews identified that their parents' beliefs and behaviours, embedded within their cultural heritage, were significant factors in their academic lives. The preceding discussion has explored the literature pertaining to culturally specific, Asian background parenting practices and their subsequent impact on academic and psychosocial outcomes for students. The majority of research has produced an overwhelmingly negative image of Asian parenting practices.

At the same time, such research has been criticised for applying out dated and inappropriate typologies of parenting, employing broad generalisations without considering within-group variations, and relying solely on quantitative approaches. More contemporary research that has adopted a range of methodologies and specifically examined unique variations, has demonstrated a more complex image. Specifically, for families that engage in so-called tiger parenting practices, the outcomes may be costly in relation to psychosocial domains. However, there is also evidence that Asian-heritage parents are employing practices that emphasise nurturance and warmth to produce positive developmental outcomes.

It is hoped that by examining this issue qualitatively, the present investigation will provide insight into the experiences of the Asian background students sampled, with regard to the roles played by their cultural heritage and by their parents in shaping their school lives. Moreover, by analysing the interview data for comparisons and contrasts across the differing schooling contexts (selective and comprehensive), and students of differing self-concept levels (high and low), it is hoped that any interactive effects will be uncovered. Furthermore, the quantitative data will be examined in a post-hoc manner to uncover any broad, between-group differences on the measured academic and wellbeing outcomes amid students of self-identified Anglo Australian or Asian Australian heritage, and to determine whether the educational context of the school impacted on these cultural groupings in a similar or different manner.

Chapter Summary

The review of literature in this chapter has attempted to link, synthesise, and clarify the immense bodies of theoretical and empirical literature that span across academic self-concept, the BFLPE, ability grouping practices, GAT, and selective schooling. Throughout this discussion, implications arising from each of these areas that were of significance to and were the impetus for the present investigation, have been clearly emphasised. The following chapter outlines the specific aims, hypotheses, and research questions driving the current investigation.

CHAPTER 4 SUMMARY OF THE SPECIFIC FOCI OF THE PRESENT INVESTIGATION: AIMS, HYPOTHESES, AND RESEARCH QUESTIONS

Introduction

The central purpose of the present chapter is to outline the aims, hypotheses, and research questions driving the current investigation. The chief focus of the present research was to generate understanding about whether and how differing school settings—specifically, academically selective and mixed-achievement comprehensive—differentially impact upon high academically achieving students' academic outcomes and psychosocial wellbeing. The present study comprised three interconnected studies designed to achieve this purpose.

The primary purpose of Study 1 was to establish the psychometric soundness of the survey instruments selected to quantitatively measure the constructs under focus, using rigorous statistical methods, both cross-sectionally and longitudinally, so as to create a solid research base. Study 2 quantitatively examined the extent to which academic achievement and a range of psychosocial wellbeing outcomes (spanning academic self-concept, academic buoyancy, relationships with parents, pressure to achieve, and mental health) differed significantly between high achieving students educated in diverse educational settings over two time waves.

Additionally, the relations between the psychosocial constructs and the academic achievement constructs across time, and whether these relations differed across the educational setting/achievement level groups (selective students, high achieving comprehensive students, and other achievement comprehensive students) were examined to elucidate the factors that serve to enhance or impede the students' wellbeing and achievement. The last component of Study 2 was driven by the qualitative component of this research, which revealed cultural background as a major influencing variable in the students' school lives.

As such, Study 2 investigated whether the cultural background of students, specifically Anglo Australian and non-Anglo Australian, impacted differentially

upon students' academic and psychosocial outcomes over time, and the interaction of any cultural differences with achievement level groupings. For the cultural background analyses, only the high achieving comprehensive and the other achieving comprehensive student groups were included. The selective student group contained only five participants of an Anglo Australian background, thus violating the sample size requirements (Hills, 2008). This will be discussed in more depth in Chapter 5.

Study 3 employed a qualitative research design to enrich and extend upon the quantitative findings. It utilised in-depth student interview responses to reveal the role played by, and interconnections between, the student level variables of academic achievement, self-concept, and psychosocial wellbeing, and the external influences of parents, teachers, peers, and the school institution itself in shaping the students' school life experiences.

The specific aims, hypotheses, and research questions that directed each study are outlined next. Hypotheses were developed based on previous theory and research, as presented in Chapter 2 and Chapter 3. Where past theory and research were lacking, making it difficult to formulate any clear predictions, research questions were devised. In order to avoid repetition of the discussion of the literature in Chapters 2 and 3, only the hypotheses and research questions are presented below. Prior to presentation of the hypotheses and research questions relevant to each study, the guiding aims are numbered and outlined. The hypotheses and research questions are also numbered, with a three-digit identifier. The first digit represents the study (i.e., 1, 2, or 3); the second digit is representative of the aim it refers to; the third digit serves to specify the particular hypothesis or research question under study. For example, Hypothesis 1.2.3 refers to Study 1, Aim 2, Hypothesis 3, and Research Question 2.2.1 refers to Study 2, Aim 2, and Research Question 1. Additionally, each of the hypotheses and research questions is presented with a clear label for further ease of interpretation.

Study 1: Psychometric Properties of the Instrumentation at Time 1 and Time 2

Statement of the Problem

Do the measurement instruments used to evaluate the academic achievement and psychosocial wellbeing outcomes, including academic self-concept, academic buoyancy, relationships with parents, pressure to achieve, and depressive and anxious tendencies of secondary students demonstrate acceptable psychometric

properties at both testing time points? Specifically, do the measures show: (a) normal distribution and internal consistency reliability of all subscales; (b) a valid underlying factor structure that conforms to the facets the instrument was hypothesised to measure; and (c); invariance of the factor structure of the instrumentation across critical sub-groups within the sample, specifically males and females, early secondary (Year 7 and 8) and middle secondary (Year 9 and 10) student year levels, and school setting/academic achievement groups (selective, high achievement comprehensive, and other achievement comprehensive)? It is imperative that these conditions be met in order to provide a solid within-construct base before proceeding to investigation of between-construct issues.

Aims

The aims of Study 1 were to:

1. Test the normality and internal consistency reliability of all subscales within the instruments utilised to measure academic achievement and psychosocial outcomes, specifically: Mathematics, Spelling, and Sentence Comprehension achievement, Mathematics, English, and General School academic self-concept, Mathematics and English academic buoyancy, Parental Relations self-concept, Parental and Teacher pressure to achieve, Depression, and Anxiety, to demonstrate that each was normally distributed and reliable;
2. Assess the construct validity of the factor structure of the instruments employed (i.e., the configuration of factor loadings, variances/covariances, and correlated uniquenesses), specifically: the Wide Range Achievement Test 4 (WRAT4; Wilkinson & Robertson, 2006), Academic Self-Description Questionnaire II (ASDQ-II) subscales (Marsh, 1990b), Self-Description Questionnaire II Short (SDQII-S) subscales (Marsh, Ellis, Parada, Richards, & Heubeck, 2005), Academic Buoyancy Scale (ABS; Martin & Marsh, 2006; 2008a), Index of Achievement Press (IAP; based on Organisation for Economic Cooperation and Development, 2002), and Depression, Anxiety, and Stress 21 (DASS-21) subscales (Lovibond & Lovibond, 1995), to demonstrate that each was valid and psychometrically sound; and
3. Examine the factorial invariance or equivalence of the instruments across gender, year level (junior and middle high school students), and setting/achievement groups (selective, high achieving comprehensive, and other

achieving comprehensive) to demonstrate that each of the measures' theoretically derived factors was applicable across these different groups.

Statement of Hypotheses and Research Questions

Wide Range Achievement Test 4 (WRAT4)

Hypothesis 1.1.1: Normality and reliability of the WRAT4. It was predicted that distribution and reliability tests would demonstrate normality and internal consistency for the three subscales measured by the WRAT4 (Mathematics, Spelling, and Sentence Comprehension) at Time 1 and Time 2.

Hypothesis 1.2.1: Factor Structure of the WRAT4. It was posited that the data would support a sound three-factor structure (Mathematics, Spelling, and Sentence Comprehension) for the WRAT4 at Time 1 and Time 2 through confirmatory factor analysis (CFA).

Hypothesis 1.3.1: Factorial invariance of the WRAT4 across gender. Hypothesis 1.3.1 predicted that the factor structure of the WRAT4 would be similar for both males and females at Time 1 and Time 2 points of testing.

Hypothesis 1.3.2: Factorial invariance of the WRAT4 across year level. Hypothesis 1.3.2 predicted that the student responses to the WRAT4 would produce a consistent factor structure for both year level groups, junior and middle secondary students, across each time wave.

Hypothesis 1.3.3: Factorial invariance of the WRAT4 across setting/achievement groups. Hypothesis 1.3.3 predicted that the factor structure of the WRAT4 would be consistent for academically selective, high achieving comprehensive, and other achieving comprehensive student groupings at Time 1 and Time 2.

Academic Self-Description Questionnaire II (ASDQ-II) Subscales

Hypothesis 1.1.2: Normality and reliability of the ASDQ-II subscales. It was hypothesised that tests of distribution and reliability would demonstrate normality and acceptable Cronbach's alpha values for the two subscales utilised from the ASDQ-II (Mathematics and English academic self-concept).

Hypothesis 1.2.2: Factor structure of the ASDQ-II subscales. It was hypothesised that CFA would support a sound a priori two-factor structure (Mathematics and English academic self-concept) of the ASDQ-II subscales at Time 1 and Time 2.

Hypothesis 1.3.4: Factorial invariance of the ASDQ-II subscales across gender. It was predicted that the factor structure of the ASDQ-II subscales of Mathematics and English academic self-concept would be invariant across males and females at Time 1 and Time 2.

Hypothesis 1.3.5: Factorial invariance of the ASDQ-II subscales across year level. Hypothesis 1.3.5 predicted that the factor structure of the ASDQII subscales would be a consistent measure for both junior and middle school students across both time waves.

Hypothesis 1.3.6: Factorial invariance of the ASDQ-II subscales across setting/achievement groups. Hypothesis 1.3.6 predicted that the student responses to the ASDQII subscales would demonstrate a consistent factor structure for the three school setting/academic achievement groupings across Time 1 and Time 2 points of testing.

Self-Description Questionnaire II Short (SDQII-S) Subscales

Hypothesis 1.1.3: Normality and Reliability of the SDQII-S subscales. It was predicted that the General School and Parent Relations self-concept subscales of the SDQII-S utilised in the present study would be normally distributed and would exhibit sound internal consistency reliability at both time points.

Hypothesis 1.2.3: Factor structure of the SDQII-S subscales. It was hypothesised that data would support a sound two-factor structure (General School and Parent Relations self-concept) underpinning the SDQII-S subscales at Time 1 and Time 2, as assessed via CFA.

Hypothesis 1.3.7: Factorial invariance of the SDQII-S subscales across gender. It was predicted that the factor structure of the SDQII-S subscales would be invariant across males and females at Time 1 and Time 2.

Hypothesis 1.3.8: Factorial invariance of the SDQII-S subscales across year level. Hypothesis 1.3.8 predicted that the factor structure of the SDQII-S subscales would be similar for junior and middle school year participants for Time 1 and Time 2.

Hypothesis 1.3.9: Factorial invariance of the SDQII-S subscales across setting/achievement groups. Hypothesis 1.3.9 predicted that the subscales of the SDQII-S would be a consistent measure for selective students, and for students of high and lower achievement levels within the comprehensive school.

Academic Buoyancy Scale (ABS)

Hypothesis 1.1.4: Normality and reliability of the ABS. Hypothesis 1.1.4 predicted that tests of normality and internal consistency would support the normal distribution and reliability of the Mathematics and English academic buoyancy subscales across both time points.

Hypothesis 1.2.4: Factor structure of the ABS. It was predicted that data would support a sound two-factor structure (Mathematics and English academic buoyancy) of the newly developed ABS at Time 1 and Time 2.

Hypothesis 1.3.10: Factorial Invariance of the ABS across gender. It was hypothesised that the two-factor structure of the ABS would be invariant across males and females for both Time 1 and Time 2 phases of testing.

Hypothesis 1.3.11: Factorial Invariance of the ABS across year level. Hypothesis 1.3.11 predicted that the structure of the ABS would be similar across junior and middle year level groupings at Time 1 and Time 2.

Hypothesis 1.3.12: Factorial Invariance of the ABS across setting/achievement groups. Hypothesis 1.3.12 predicted that the factorial structure of the ABS would be consistent for selective, high- and other achievement comprehensive school students across each time wave.

Index of Achievement Press (IAP)

Hypothesis 1.1.5: Normality and reliability of the IAP. Hypothesis 1.1.5 predicted that tests of normality would demonstrate a normal distribution of the Parent and Teacher pressure to achieve subscales. Moreover, based on prior research results (Adams & Wu, 2002—see Chapter 5) it was hypothesised that reliability tests would demonstrate lowered but acceptable levels of internal consistency.

Hypothesis 1.2.5: Factor structure of the IAP. It was predicted that CFA results would support a sound two-factor structure (Parent and Teacher pressure to achieve) of the newly adapted IAP for Time 1 and Time 2 phases of testing.

Hypothesis 1.3.13: Factorial invariance of the IAP across gender. It was hypothesised that the two-factor structure of the IAP would be similar for both males and females at Time 1 and Time 2, as demonstrated by multi-group CFA tests of invariance.

Hypothesis 1.3.14: Factorial invariance of the IAP across year level. Hypothesis 1.3.14 predicted that the factor structure of the IAP would be consistent

for junior and middle year level groups at Time 1 and Time 2 as demonstrated by CFA tests of invariance.

Hypothesis 1.3.15: Factorial invariance of the IAP across setting/achievement groups. Hypothesis 1.3.15 predicted that the factor structure of the IAP would be a consistent measure for each of the three school setting/academic achievement groupings across both time waves of data.

Depression, Anxiety, and Stress-21 (DASS-21) Subscales

Hypothesis 1.1.6: Normality and reliability of the DASS-21 subscales. Hypothesis 1.1.6 predicted that the DASS-21 subscales of Depression and Anxiety would exhibit normality and internal consistency, as demonstrated by tests of distribution and reliability.

Hypothesis 1.2.6: Factor structure of the DASS-21 subscales. It was hypothesised that data would support a sound, two-factor structure underpinning the Depression and Anxiety subscales of the DASS-21 at Time 1 and Time 2, as demonstrated via CFA.

Hypothesis 1.3.16: Factorial invariance of the DASS-21 subscales across gender. Hypothesis 1.3.16 predicted that the factor structure of the DASS-21 subscales would be similar for males and females at Time 1 and Time 2, as tested by CFA tests of invariance.

Hypothesis 1.3.17: Factorial invariance of the DASS-21 subscales across year level. Hypothesis 1.3.17 predicted that the subscales of the DASS-21 would be consistent measures across junior and middle year level student groups at Time 1 and Time 2 points of testing.

Hypothesis 1.3.18: Factorial invariance of the DASS-21 subscales across setting/achievement groups. Hypothesis 1.3.18 predicted that the factor structure of the Depression and Anxiety subscales of the DASS-21 measure would be consistent for academically selective, high achievement comprehensive, and other achievement comprehensive student groups at each time wave.

Instrument Battery

Research Question 1.2.7: Structural integrity of the assessment battery. Research Question 1.2.7 asked whether the factor structure of the individual measures would be upheld at Time 1 and Time 2, despite all of the instruments being combined into one assessment battery. Additionally, the network of relations between latent factors was of interest, in order to determine whether the factors were

related in a logical and theoretically coherent manner, wherein conceptually related factors were more strongly correlated compared to conceptually dissimilar factors.

Study 2: The Quantitative Impact of Differing School Settings on High Achieving Students' Academic Achievement and Psychosocial Wellbeing Outcomes, the Reciprocal Relations between Psychosocial Wellbeing and Achievement, and the Role of Cultural Heritage

Statement of the Problem

Do contrasting educational settings (academically selective schools and mixed-achievement level comprehensive schools) impact differentially on the academic achievement of high achieving students over time? Do differing educational environments differ in their impact on the psychosocial wellbeing of high achieving students over time, including: (a) multidimensional facets of academic self-concept; (b) academic buoyancy; (c) relationships with parents; (d) pressure to achieve from teachers and parents; (e) depressive tendencies; and (f) anxiety levels? What are the predictive relations between Time 1 psychosocial wellbeing constructs and Time 2 achievement in Mathematics and English, and between Time 1 measures of achievement and Time 2 psychosocial wellbeing measures, and do these relations differ across school setting/academic achievement groupings (selective, high achievement comprehensive, and other achievement comprehensive)?

Following analysis of the qualitative interview data, it became apparent that cultural background was an integral component to high achieving students' academic and social experiences. As such, the following questions were proposed post-hoc in order to quantitatively gauge the impact of culture on achievement and wellbeing: Do the distinct cultural backgrounds of the students (Anglo Australian and non-Anglo Australian) impact differentially on their academic achievement over time? Do the differing cultural backgrounds of students differ in their impact on select psychosocial wellbeing outcomes indicated by the qualitative component as outcomes of importance, including: (a) academic self-concept; (b) relationships with parents; and (c) pressure to achieve? How do any differences on achievement and wellbeing that are due to cultural background, interact across the achievement level of students?

Aims

The aims of Study 2 were to:

1. Examine the differential impact of diverse educational settings (academically selective schools and comprehensive schools) on the academic achievement of high achieving students, as evidenced by their Mathematics and English achievement scores across two time points;
2. Investigate the differential impact of diverse educational settings (academically selective schools and comprehensive schools) on the psychosocial wellbeing of high achieving students over time, as evidenced by their: (a) academic-self-concept; (b) academic buoyancy; (c) relationships with parents; (d) pressure to achieve; (e) levels of depression; and (f) levels of anxiety;
3. Uncover the reciprocal relations between various facets of student psychosocial wellbeing and academic achievement over time, and whether these relations are similar or different across each school setting/achievement grouping;
4. Determine the differential impact of the distinct cultural backgrounds of the students (Anglo Australian and non-Anglo Australian) on their academic achievement across two time points, and whether any effects found are similar or different across achievement groupings; and
5. Assess the differential impact of the distinct cultural backgrounds of the students (Anglo Australian and non-Anglo Australian) on key psychosocial wellbeing variables over time, specifically: (a) Mathematics and English academic self-concept; (b) Parental Relations self-concept; and (c) Parent pressure to achieve. If any differences are found, determine whether they are consistent or dissimilar across the achievement groups.

Statement of the Hypotheses and Research Questions

The Impact of Different Educational Settings on Academic Achievement

Research Question 2.1.1: Selective compared to high achievement comprehensive students on Mathematics achievement. Research Question 2.1.1 asked whether there were any significant differences between high achieving selective students and high achieving comprehensive students in relation to their Mathematics achievement at Time 1 or Time 2, in terms of total effects and change over time.

Hypothesis 2.1.2: High achievement comprehensive students compared to other achievement comprehensive students on Mathematics achievement.

Hypothesis 2.1.2 predicted that high achieving comprehensive students would have significantly higher achievement in Mathematics than other achieving comprehensive students at both time points, with regard to total effects and change over time.

Research Question 2.1.3: Selective compared to high achievement comprehensive students on Spelling achievement. Research Question 2.1.3 asked whether high achieving selective students and high achieving comprehensive students differed significantly on Spelling achievement at Time 1 or Time 2, in terms of total effects and change over time.

Hypothesis 2.1.4: High achievement comprehensive students compared to other achievement comprehensive students on Spelling achievement. Hypothesis 2.1.4 predicted that the high achieving comprehensive students would perform significantly better in Spelling than the other achieving comprehensive students in terms of total effects and change over time.

Research Question 2.1.5: Selective compared to high achievement comprehensive students on Sentence Comprehension achievement. Research Question 2.1.5 asked whether differing educational settings (selective or comprehensive) differentially impacted on the Sentence Comprehension achievement of high achieving students across time in relation to Time 1 and Time 2 total effects, and change over time.

Hypothesis 2.1.6: High achievement comprehensive students compared to other achievement comprehensive students on Sentence Comprehension achievement. Hypothesis 2.1.6 predicted that the high achieving comprehensive students would attain significantly higher achievement in Sentence Comprehension than the other achieving comprehensive students with relation to total effects and change over time.

The Impact of Different Educational Settings on Psychosocial Wellbeing

Hypothesis 2.2.1: Selective compared to high achievement comprehensive students on Mathematics self-concept. Hypothesis 2.2.1 predicted that the high achieving selective students would possess significantly lower Mathematics self-concepts than high achieving students educated within a comprehensive school setting at both time points, controlling for SES, cultural heritage and achievement.

Left as a research question was the change over time analysis, which assessed whether, controlling for prior self-concept, selective students' Mathematics self-concepts would decline significantly across the school year, in comparison to high achieving comprehensive students.

Research Question 2.2.2: High achievement comprehensive students compared to other achievement comprehensive students on Mathematics self-concept. Research Question 2.2.2 asked whether the high achieving comprehensive students would differ significantly in terms of their Mathematics self-concepts with regard to total effects and change over time, when compared to students of other achievement levels within the same educational setting.

Hypothesis 2.2.3: Selective compared to high achievement comprehensive students on English self-concept. Hypothesis 2.2.3 predicted that the high achieving selective students would possess significantly lower English self-concepts than high achieving students educated within a comprehensive school setting at both time points, controlling for SES, cultural heritage and achievement. Left as a research question was the change over time analysis, which assessed whether, controlling for prior self-concept, the selective students' English self-concepts would significantly decline across the school year, in comparison to high achieving comprehensive students.

Research Question 2.2.4: High achievement comprehensive students compared to other achievement comprehensive students on English self-concept. Research Question 2.2.4 asked whether comprehensive students of high achievement and other achievement levels would differ significantly with regard to their self-perceptions in English at Time 1 or Time 2, in relation to total effects and change over time.

Hypothesis 2.2.5: Selective compared to high achievement comprehensive students on General School self-concept. Hypothesis 2.2.5 predicted that the high achieving selective students would possess significantly lower General School self-concepts than high achieving students educated within a comprehensive school setting at both time points, controlling for SES, cultural heritage and achievement. Left as a research question was the change over time analysis, which assessed whether, controlling for prior self-concept, selective students' General School self-concepts would significantly decline across the school year, in comparison to high achieving comprehensive students.

Research Question 2.2.6: High achievement comprehensive students compared to other achievement comprehensive students on General School self-concept. Research Question 2.2.6 posed whether high achieving comprehensive students would differ significantly from other achievement comprehensive students in terms of their General School self-perceptions at Time 1 and Time 2, measured as total effects and change over time.

Research Question 2.2.7: Selective compared to high achievement comprehensive students on Mathematics academic buoyancy. Research Question 2.2.7 asked whether attending a selective or a comprehensive school would have a differential effect on high achieving students' buoyancy in Mathematics across two time waves, with regard to total effects and as change over time.

Research Question 2.2.8: High achievement comprehensive students compared to other achievement comprehensive students on Mathematics academic buoyancy. Research Question 2.2.8 asked whether there were any significant differences between comprehensive school students of a high achievement level and those of other achievement levels in relation to Time 1 and Time 2 Mathematics buoyancy in terms of total effects, and change across time.

Research Question 2.2.9: Selective compared to high achievement comprehensive students on English academic buoyancy. Research Question 2.2.9 posed whether there were any significant total effects or change over time differences between selective school students and their high achieving counterparts within the comprehensive schools in relation to their English buoyancy at Time 1 and Time 2.

Research Question 2.2.10: High achievement comprehensive students compared to other achievement comprehensive students on English academic buoyancy. Research Question 2.2.10 asked whether students of high achievement level and those of a lower achievement level, both located within the comprehensive school setting, were similar or different in relation to their English buoyancy at Time 1 or Time 2 in terms of total effects or change over time.

Research Question 2.2.11: Selective compared to high achievement comprehensive students on Parental Relations Self-Concept. Research Question 2.2.11 asked whether high achieving students in the selective and comprehensive settings would possess similar or different Parental Relations self-concepts at Time 1 and Time 2, measured as total effects and as change over time.

Research Question 2.2.12: High achievement comprehensive students compared to other achievement comprehensive students on Parental Relations self-concept. Research Question 2.2.12 posed whether high achieving and other achieving comprehensive students would report similar or different relationships with their parents, in terms of total effects and change over time.

Results for Research Question 2.2.13: Selective compared to high achievement comprehensive students on Parental pressure to achieve. Research Question 2.2.13 asked whether the educational setting in which high achieving students were situated (selective or comprehensive) differentially affected the pressure they received from their parents to do well academically at Time 1 and Time 2, in regard to total effects and change over time.

Research Question 2.2.14: High achievement comprehensive students compared to other achievement comprehensive students on Parental pressure to achieve. Research Question 2.1.14 asked whether comprehensive school high achievers differed to their lower achievement peers within the same educational setting in terms of the pressure they received from their parents to achieve well at school, measured as total effects and change across time.

Research Question 2.2.15: Selective compared to high achievement comprehensive students on Teacher pressure to achieve. Research Question 2.2.15 asked whether there were any significant total effects or change over time differences between high achieving selective students and high achieving comprehensive students in relation to the pressure received from teachers at Time 1 or Time 2, with regard to total effects and change over time.

Research Question 2.2.16: High achievement comprehensive students compared to other achievement comprehensive students on Teacher pressure to achieve. Research Question 2.1.16 posed whether there were any significant differences between high achieving comprehensive students and other achievement level comprehensive students in pressure received from teachers at Time 1 or Time 2, with regard to total effects and change over time.

Research Question 2.2.17: Selective compared to high achievement comprehensive students on Depression. Research Question 2.2.17 asked whether the educational settings (selective or comprehensive) in which high achieving students were educated had a differential impact on their depressive tendencies, measured as total effects and as change over time at two points during the school year.

Research Question 2.2.18: Depression in high achievement comprehensive students compared to other achievement comprehensive students. Research Question 2.1.18 asked whether levels of reported Depression would differ between high achieving comprehensive students and other achievement comprehensive students, with regard to total effects and change over time.

Research Question 2.2.19: Selective compared to high achievement comprehensive students on Anxiety. Research Question 2.1.19 asked whether high achieving selective students and high achieving comprehensive students differed significantly in terms of their levels of reported Anxiety at Time 1 or Time 2, measured as total effects and change over time.

Research Question 2.2.20: High achievement comprehensive students compared to other achievement comprehensive students on Anxiety. Research Question 2.2.20 posed whether students of differing achievement levels in the comprehensive school setting would report similar or different levels of Anxiety, measured as total effects and change over time.

The Reciprocal Relations between Psychosocial Constructs and Academic Achievement

Hypothesis 2.3.1: The reciprocal relations between Mathematics self-concept and Mathematics achievement across student setting/achievement groups. Hypothesis 2.3.1 predicted that in accordance with the REM (Marsh & Craven, 2006), Mathematics self-concept and Mathematics achievement would share significant and positive reciprocal relations for the selective, high achievement comprehensive, and other achievement comprehensive student groups. Left as a research question was the strength of the relations and whether they were similar in size across the groups.

Hypothesis 2.3.2: The reciprocal relations between English self-concept and English achievement across student setting/achievement groups. In accordance with the REM (Marsh & Craven, 2006), Hypothesis 2.3.2 predicted that prior English self-concept would have significant positive relations with subsequent English achievement (comprising Spelling and Sentence Comprehension) and prior achievement in English would be a significant positive predictor of later English self-concept for selective students, high achieving comprehensive students, and other achievement comprehensive students. Left as a research question was the strength of the beta paths and whether they would be similar or different across the three groups.

Hypothesis 2.3.3: The reciprocal relations between General School self-concept and Mathematics achievement across student setting/achievement groups.

Hypothesis 2.3.3 predicted that in accordance with the REM (Marsh & Craven, 2006), prior General School self-concept would have a significantly positive relation to later achievement in Mathematics, and prior Mathematics achievement would be positively related to subsequent General School self-concept for each of the three student setting/achievement groups: selective, high achievement comprehensive, and other achievement comprehensive. Left as a research question was the strength of the beta paths and whether they were similar or different across the three groups.

Hypothesis 2.3.4: The reciprocal relations between General School self-concept and English achievement across student setting/achievement groups. In accordance with the REM (Marsh & Craven, 2006), Hypothesis 2.3.4 predicted that prior General School self-concept would have a significantly positive relation to later achievement in Spelling and Sentence Comprehension, and prior achievement in English would significantly positively relate to subsequent General School self-concept for all students, irrespective of their school setting and academic achievement level. Left as a research question was the strength of the beta paths and whether they would be similar or different across the three groups.

Research Question 2.3.5: The reciprocal relations between Mathematics academic buoyancy and Mathematics achievement across student setting/achievement groups. Research Question 2.3.5 asked whether prior Mathematics academic buoyancy would be a significant predictor of later Mathematics achievement and vice versa, for each of the selective, high achieving comprehensive, and other achieving comprehensive student groups. Moreover, it was asked, where significant relations were found, were they statistically similar or different across the three groups.

Research Question 2.3.6: The reciprocal relations between English academic buoyancy and English achievement across student setting/achievement groups. Research Question 2.3.6 asked whether Time 1 English academic buoyancy would significantly relate to Time 2 Spelling and Sentence Comprehension achievement, and vice versa, for each of the selective, high achieving comprehensive, and other achieving comprehensive student groups. Moreover, if significant relations were found, it was asked whether they were of the same magnitude across the three groups studied.

Research Question 2.3.7: The reciprocal relations between Parental Relations self-concept and Mathematics achievement across student setting/achievement groups. Research Question 2.3.7 investigated whether, holding constant any differences in SES and cultural heritage, prior Parental Relations self-concept was significantly related to subsequent Mathematics achievement or vice versa for the selective students, high achieving comprehensive students, and other achieving comprehensive students,. If significant relations were found, it was further asked whether these were statistically similar or different across the groups.

Research Question 2.3.8: The reciprocal relations between Parental Relations self-concept and English achievement across student setting/achievement groups. Research Question 2.3.8 investigated whether Time 1 Parental Relations self-concept was significantly related to Time 2 English achievement and vice versa for the selective, high achievement comprehensive, and other achievement comprehensive students. If significant relations were found, it was further asked whether the size of the paths found were statistically similar or different across the groups.

Research Question 2.3.9: The reciprocal relations between Parental pressure to achieve and Mathematics achievement across student setting/achievement groups. Research Question 2.3.9 asked whether prior Parental pressure to achieve would be significantly related to later achievement in Mathematics and vice versa for the three groups of students: selective, high achievement comprehensive, and other achievement comprehensive. Furthermore, if any relations were found, it was asked whether they were similar or different across the three groups.

Research Question 2.3.10: The reciprocal relations between Parental pressure to achieve and English achievement across student setting/achievement groups. Research Question 2.3.10 asked if there was any significant impact of Time 1 Parental pressure to achieve on Time 2 English achievement (Spelling and Sentence Comprehension), and Time 1 English achievement on Time 2 Parental pressure to achieve for the selective, high achievement comprehensive, and other achievement comprehensive students. Furthermore, it was asked whether any impact found was similar or different across the three groups.

Research Question 2.3.11: The reciprocal relations between Teacher pressure to achieve and Mathematics achievement across student setting/achievement groups. Research Question 2.3.11 asked whether prior Teacher pressure to achieve had a significant relation to subsequent Mathematics achievement, and prior Mathematics achievement had a significant relation to later Teacher pressure to achieve, for each of the three student setting/academic achievement groups: selective, high achievement comprehensive, and other achievement comprehensive. Moreover, if significant relations were found, it was asked were they similar across all three groups.

Research Question 2.3.12: The reciprocal relations between Teacher pressure to achieve and English achievement across student setting/achievement groups. Research Question 2.3.12 asked whether prior Teacher pressure to achieve had a significant impact on subsequent English achievement (comprised of Spelling and Sentence Comprehension), and whether prior English achievement was significantly related to later Teacher pressure to achieve for each of the three student setting/academic achievement groups: selective, high achievement comprehensive, and other achievement comprehensive. If any significant relations were found, it was further asked whether these relations were of the same magnitude for all three student groups.

Research Question 2.3.13: The reciprocal relations between Depression and Mathematics achievement across student setting/achievement groups. Research Question 2.3.13 asked whether prior Depression significantly predicted later Mathematics achievement, and whether previous Mathematics achievement was related to subsequent levels of Depression for the three student setting/academic achievement groups: selective, high achievement comprehensive, and other achievement comprehensive. Furthermore, if any significant effects were found, it was also asked whether these were similar or different across the groups.

Research Question 2.3.14: The reciprocal relations between Depression and English achievement across student setting/achievement groups. Research Question 2.3.14 asked whether Time 1 Depression significantly impacted Time 2 English achievement (Spelling and Sentence Comprehension), and whether Time 1 English achievement was significantly related to Time 2 Depression for the three groups of interest: selective, high achievement comprehensive, and other achievement comprehensive students. Moreover, if any significant effects were

found, it was further examined whether the relations were similar or different across the three groups.

Research Question 2.3.15: The reciprocal relations between Anxiety and Mathematics achievement across student setting/achievement groups. Research Question 2.3.15 asked whether Anxiety and Mathematics achievement shared any significant reciprocal relations, and whether any relations found were similar or different across the selective, high achievement comprehensive, and other achievement comprehensive groupings.

Research Question 2.3.16: The reciprocal relations between Anxiety and English achievement across student setting/achievement groups. Research Question 2.3.16 asked whether Time 1 Anxiety would have any significant relations with Time 2 English achievement (comprised of Spelling and Sentence Comprehension facets), and whether Time 1 English achievement would significantly impact Time 2 Anxiety within any of the student setting/achievement groups. If any significant relations were found, it was further asked whether the relations were statistically similar across the groups.

The Impact of Cultural Background on Academic Achievement

Research Question 2.4.1: Cultural background differences on Mathematics achievement across student achievement groupings. Research Question 2.4.1 asked whether there were any significant differences between Anglo Australian and non-Anglo Australian students in relation to their Mathematics achievement at Time 1 or Time 2, in terms of total effects and change over time. Moreover, if any significant relations were found, were they similar or different across the two student achievement groups that met the sample size requirements for the analysis: high and other achievement comprehensive school students.

Research Question 2.4.2: Cultural background differences on Spelling achievement across student achievement groupings. Research Question 2.4.2 asked whether Anglo Australian and non-Anglo Australian students differed significantly on Spelling achievement at Time 1 or Time 2, in terms of total effects and change over time. Furthermore, if cultural background significantly impacted on Spelling achievement, was the relation similar or different for the comprehensive school high achievers and other achievers.

Research Question 2.4.3: Cultural background differences on Sentence Comprehension achievement across student achievement groupings. Research

Question 2.4.3 asked whether diverse cultural backgrounds (Anglo Australian and non-Anglo Australian) differentially impacted on the Sentence Comprehension achievement of students in relation to Time 1 and Time 2 total effects, and change over time. Additionally, if a significant relation was found, was this of the same strength for both high and other level comprehensive achievers.

The Impact of Cultural Background on Select Psychosocial Outcomes

Research Question 2.5.1: Cultural background differences on Mathematics self-concept across student achievement groupings. Research Question 2.5.1 asked whether students of an Anglo Australian cultural background would differ significantly to students of a non-Anglo Australian cultural background in terms of their Mathematics self-concepts across time. Furthermore, if any differences were found, would they be similar for comprehensive school students classified as high achievers and other achievers.

Research Question 2.5.2: Cultural background differences on English self-concept across student achievement groupings. Research Question 2.5.2 asked whether students of differing cultural backgrounds (Anglo Australian and non-Anglo Australian) or Time 2, in relation to total effects and change over time. If cultural background is significantly related to English self-concept, is this relation similar or different for high and other level comprehensive achievers.

Research Question 2.5.3: Cultural background differences on Parental Relations self-concept across student achievement groupings. Research Question 2.5.3 asked whether Anglo Australian and non-Anglo Australian students located within the comprehensive setting would possess similar or different Parental Relations self-concepts at Time 1 and Time 2, measured as total effects and change over time. Moreover, if a significant impact was found, was this the same for the two academic groupings.

Research Question 2.5.4: Cultural background differences on Parental pressure to achieve across student achievement groupings. Research Question 2.5.4 asked whether the cultural background of students (Anglo Australian and non-Anglo Australian) differentially affected the pressure they received from their parents to do well academically at Time 1 and Time 2, in regard to total effects and change over time. Furthermore, if significance is found, will the predictive paths be similar or different across the two academic groups: high and other achievement comprehensive.

Study 3: A Comparative and Contrastive Qualitative Investigation Uncovering the School Life Perceptions and Experiences of High Achieving Selective and Comprehensive Students of Differing Levels of Self-Concept

Statement of the Problem

A review of the literature revealed that few qualitative studies have investigated the characteristics and impact of academic segregation and mixed-achievement educational settings for high achievers. This is a research gap that needs to be addressed, considering the popularity of and controversy surrounding selective schools in NSW. Further to this, there is increasing recognition and practice of mixed methods research, with many researchers, from an array of disciplines, acknowledging that quantitative and qualitative research methods are complementary in nature (Creswell & Plano Clark, 2011; Teddlie & Tashakkori, 2009). The use of a mixed-methodology approach allows both for the consolidation of findings, and the revelation of issues that would not be uncovered by the use of either method on its own.

Therefore, the purpose of the qualitative component of this study was to: (1) further explicate the impact of diverse schooling environments for high achievers; (2) allow comparisons of experiences from different types of educational settings; (3) allow a deeper understanding of the quantitative data with the perceptions and experiences of the students being canvassed directly; (4) explain the mechanisms and nuances underlying the statistical results; and (5) enable the extension and elaboration of the quantitative findings by providing additional insights. Most importantly, the findings from both the quantitative and qualitative components were considered, not merely in isolation, but also interactively, to uncover convergence, corroboration, divergence, and dissonance, allowing the findings from each method to be enriched.

Aims

The aims of Study 3 were to:

1. Conduct a comparative and contrastive investigation in the two school settings by enabling students to reveal their positive and negative experiences of each environment, as driven by the preceding quantitative analysis;
2. Gain insight into the human experience behind the statistical results, to enrich the quantitative data and to understand more closely the experiences of high achieving students; and to

3. Elucidate any emerging themes and issues the students deemed of importance that were overlooked or untapped in the quantitative study.

Statement of the Research Questions

Research Question 3.1.1: Assessing school strengths and weaknesses.

What aspects of the school environment are seen as positive, and what are the areas that can be built on to improve students' wellbeing?

Research Question 3.1.2: Relationships with teachers. What are the students' perceptions of their teachers? Do the students think their teachers want them to do well, and how do they gauge this?

Research Question 3.1.3, Pressure to achieve from teachers. Do students feel that their teachers place pressure on them to do well?

Research Question 3.1.4: Relationships with parents. How do students relate to and interact with their parents?

Research Question 3.1.5: Pressure to achieve from parents. Do the students feel that their parents are concerned with their academic performance? What is the evidence for their beliefs?

Research Question 3.1.6: Self-perceptions of Mathematics achievement. How do the high achieving students feel about their performance in Mathematics?

Research Question 3.1.7: Self-perceptions of English achievement. How do the high achieving students feel about their performance in English?

Research Question 3.1.7: Buoyancy in Mathematics. What do the students do in response to a bad mark in Mathematics?

Research Question 3.1.8: Buoyancy in English. How do the students react to a bad mark in English?

Research Question 3.1.9: Experiences of depression. Do any aspects of the schooling environment or associated factors cause the students to feel depressed?

Research Question 3.1.10: Experiences of anxiety. Are there any school life variables that may contribute to the students feeling anxious?

Research Question 3.2.1: Additional themes. Are there any further themes relating to high achievers' achievement and wellbeing that were not considered in the quantitative component of the study?

Chapter Summary

This chapter has outlined the problem, aims, hypotheses, and research questions for each of the three studies that comprise the current synergistic investigation. A mixed-method research design was deemed the most appropriate research tool to address the overarching aims, given the array of issues at hand in the present study, and given the strengths that arise from integrating both quantitative and qualitative approaches. The next chapter details the methodology utilised in each of the three studies, to address the hypotheses and research questions.

CHAPTER 5 METHODOLOGY

Introduction

A mixed methods research design comprising three synergistic studies was implemented, to investigate the hypotheses and research questions posed in Chapter 4. The purpose of this chapter is to detail the methodological procedures utilised to conduct the three studies encompassed in the present investigation. Study 1 employed a quantitative research design, establishing the psychometric properties of instrumentation. Study 2 quantitatively investigated the differences between high academically achieving secondary students located in differing educational settings (academically selective and mixed-achievement comprehensive high schools) in terms of their academic achievement and various psychosocial outcomes, longitudinally across two time points. The reciprocal relations between the facets of psychosocial wellbeing and achievement across time were also investigated. Lastly, Study 2 examined the impact of differing cultural backgrounds for students' achievement and socio-emotional wellbeing. Study 3 examined the perceptions and experiences of the high achieving students regarding their educational settings, academic achievement, and psychosocial wellbeing through a qualitative research approach.

Firstly, the chapter briefly provides a rationale for the use of a mixed methods research design in the current investigation, and the framework utilised to conduct the research. Subsequently, the participant characteristics and sample demographics, data collection procedures, instrumentation, and techniques for analysing the quantitative and qualitative data are detailed.

Mixed Methods Research

A Methodology

Mixed methods research is defined as “a class of research where the researcher mixes or combines quantitative and qualitative research techniques,

methods, approaches, concepts, or language into a single study” (Johnson & Onwuegbuzie, 2004, p. 17). At its core, mixed methods research allows multiple means of seeing, hearing, interpreting, and knowing the research problem (Greene, 2007). The recognition and practice of mixed methods research methodologies has grown significantly in the last decade (Teddlie & Tashakkori, 2009), with many researchers from a wide array of disciplines now combining quantitative and qualitative research methods within a single study (Creswell & Plano Clark, 2011; Creswell, Plano Clark, Gutmann, & Hanson, 2003; Teddlie & Tashakkori, 2009). Rather than simply being a combination of the traditional quantitative and qualitative domains, mixed methods research has emerged alongside these traditions as the third methodological approach (Johnson & Onwuegbuzie, 2004; Teddlie & Tashakkori, 2009). This acknowledgement of mixed methods research as a methodological approach in its own right emerged from the recognition that quantitative and qualitative methods are in fact complementary in research design (Creswell & Plano Clark, 2011; Greene, 2007).

Quantitative research is grounded in the positivist paradigm, and understanding is generated via numerical data and statistical analyses resulting from studying a large number of individuals and considering their responses on select variables (Creswell & Plano Clark, 2011; Teddlie & Tashakkori, 2009). Alternatively, qualitative research adopts the constructivist paradigm, and understanding emerges from textual and narrative data created by studying a few individuals and exploring their experiences and perspectives in greater depth (Creswell & Plano Clark, 2011; Teddlie & Tashakkori, 2009). Thus, quantitative and qualitative methodologies provide different approaches to gathering data and therefore offer unique perspectives, each with their own inherent limitations. For example, when many people are studied quantitatively, it is argued that understanding of any single person is weakened (Johnson & Onwuegbuzie, 2004).

Quantitative research can lack a deep understanding of contextual factors within the environment of study, such as the sensitivities and subtleties of the subject being researched, and the ability of survey items to elicit the true opinions of participants with the perspectives of participants not directly heard (Guba & Lincoln, 1994). Furthermore, quantitative researchers adopt a background role, where their own weaknesses and personal biases are rarely acknowledged or discussed (Creswell & Plano Clark, 2011). Conversely, when few individuals are studied qualitatively, it

is believed that the capacity to generalise to many is weakened (Creswell & Plano Clark, 2011; Teddlie & Tashakkori, 2009). Additionally, qualitative research is criticised for the resultant bias that emerges from the personal interpretations placed by the researcher upon the data analysed (Creswell & Plano Clark, 2011). Thus, the limitations of each approach, used in isolation, have the potential to impact the integrity of the data collected, the resultant analysis, and the authenticity of interpretations and conclusions drawn from the data. However, the weaknesses of one methodological approach can be balanced and ultimately negated by the strengths of the other, and the combination of both methodologies results in a complementary union that provides a more complete understanding of the research issue than either approach in isolation (Greene, 2007; Johnson & Onwuegbuzie, 2004; Teddlie & Tashakkori, 2009).

The underlying assumption of mixed methods research then is “that there are multiple legitimate approaches to social inquiry and that any given approach to social inquiry is inevitably partial” (Green, 2007, p. 20). More than this though, mixed methods research moves beyond simply combining quantitative and qualitative methods to offset the respective weaknesses of one or the other method. Rather, mixed methods research is, at its heart, characterised by ‘methodological eclecticism’, whereby the researcher carefully chooses and synergistically incorporates the most suitable practices from a multitude of quantitative, qualitative, and mixed methodologies to best investigate and answer the research questions (Johnson & Onwuegbuzie, 2004; Teddlie & Tashakkori, 2010).

In mixed methods research, the most fundamental aspect is the research questions themselves, which drive the selection of the research tools (Greene, 2007; Johnson & Onwuegbuzie, 2004; Teddlie & Tashakkori, 2009). Informed by the purpose and rationale of the study, the research questions delineate the clear path and boundaries of the study, with the research methodologies chosen based upon a review of all available methodologies and the subsequent identification of the methods most suited to answer the research questions. It is apparent then, that a mixed methods approach is an expansive and creative form of research that most closely approximates what is actually used in everyday practice (Johnson & Onwuegbuzie, 2004).

Following from this, a mixed methods way of thinking embraces a pluralistic worldview and philosophical stance on knowledge (Creswell & Plano Clark, 2011;

Teddlie & Tashakkori, 2010). Mixed methods research is situated within the pragmatic paradigm, which spans the divide between historical positivist versus constructivist paradigm dualism, with its practical, consequential, and emergent approach (Greene, 2007; Johnson & Onwuegbuzie, 2004; Teddlie & Tashakkori, 2009). Pragmatism centres upon the idea that although an external world exists outside of our internal mind, concepts such as truth, reality, meaning, or knowledge result from the interplay between consciousness and the external world, such that truth and reality become contextual and temporal (Greene, 2007).

Researchers who adopt a pragmatic lens to view the world and their research focus instead on “what works”, and make design and methodology decisions that are practical and continually responsive to context (Teddlie & Tashakkori, 2009). At the heart of pragmatism, and therefore mixed methods research, is the belief that the researcher is generative and open, being free to choose the combination of whichever methodological techniques enable the research questions to be most comprehensively answered (Johnson & Onwuegbuzie, 2004; Teddlie & Tashakkori, 2009).

“Pragmatism rejects the either/or choices associated with the paradigm wars, advocates for the use of mixed methods in research, and acknowledges that the values of the researcher play a large role in the interpretation of results” (Tashakkori & Teddlie, 2003, p. 713).

In employing a mixed methods approach to research, the aim is not only to strengthen the validity of the findings in finding convergence or corroboration of results—in a method termed “triangulation”. Held in equal regard is divergence or dissonance in results (Greene, 2007; Johnson & Onwuegbuzie, 2004; Teddlie & Tashakkori, 2010). This emphasis on both convergent and divergent results allows the full generative potential of mixed methods research to be realised, thereby providing greater perspectives, insights, and understandings into complex aspects of the research problem that may previously have been unexplored (Greene, 2007; Teddlie & Tashakkori, 2010).

As emphasised by Greene (2007), the great advantage of thoughtfully conducted mixed methods research is that it generates “puzzles and paradoxes, clashes and conflicts” (p. 24) about the phenomenon under study that cannot be gained with a focus on mere corroboration, and therefore on triangulation, alone. As such, it was determined that the research objectives in the present investigation

would be best addressed by a mixed methods approach. A rationale specific to the overarching research questions is outlined in the next section.

Purpose and Rationale for Mixed Methods

The central research question driving the present investigation is: Do the differing schooling environments—academically selective and mixed-achievement comprehensive—in which high achieving students are educated, impact differentially on their academic achievement and psychosocial wellbeing outcomes? A deconstruction of this question demonstrates the need for the use of a mixed methodology, as quantitative and qualitative methods and data were required to best explicate the influences of differing school settings on students of a high academic standard. The quantitative study established the reliability and validity of the instrumentation, and objectively measured students' academic achievement and various facets of psychosocial wellbeing, on two occasions. This provided the appropriate statistical and measurable data to determine trends, relationships, similarities, and differences within and between the differing educational setting groups.

The qualitative study had three main purposes: it allowed a deeper understanding of the quantitative data with the perceptions and experiences of the students being directly heard; was utilised to explain the mechanisms underlying the statistical results, and the nuances in these results; and enabled the extension and elaboration of the quantitative findings by providing additional insights. Most importantly, the findings from both the quantitative and qualitative components were analysed not merely in isolation, but also interactively, to uncover convergence, corroboration, divergence, and dissonance, allowing the findings from each method to be validated. The specific mixed methods research design selected for the present investigation is outlined in the next section.

Selection of Mixed Methods Research Design

With the emergence of mixed methods research as a methodology in its own right (Teddle & Tashakkori, 2009), various design frameworks have been put forth to guide the research process. A sequential explanatory mixed methods design was utilised in the present investigation, whereby quantitative data were collected and analysed, followed by the collection and analysis of qualitative data; the quantitative data informed the progression of the study and the qualitative data served to augment and elaborate on the quantitative findings (Creswell & Plano Clark, 2011; Teddle &

Tashakkori, 2009). Additionally, Creswell and Plano Clark (2011) outline that the use of the explanatory sequential design is also valuable in forming qualitative interview groups based upon a measured characteristic within the quantitative data, in order to guide purposeful sampling for the qualitative phase. The design for the current study is depicted in Figure 5.1.

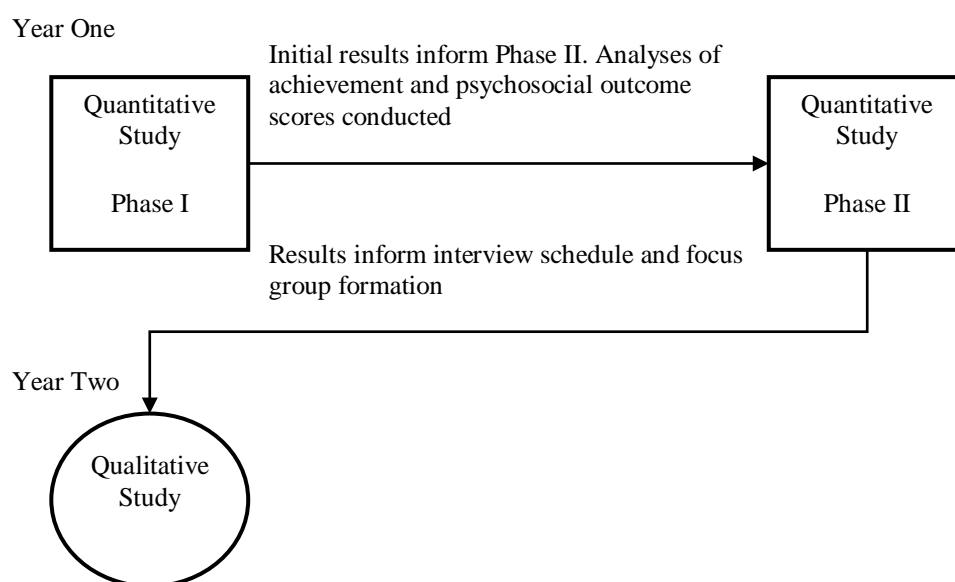


Figure 5.1. A pictorial representation of the sequential explanatory mixed methods design utilised in the present investigation.

Students completed the quantitative surveys at two time points, six months apart, within one school year. Focus groups were conducted with students in the second year. In the first quantitative phase, data analysis served to ensure that all instrumentation used was psychometrically assessed and validated. Additionally, quantitative hypotheses and research questions were answered via measuring students' academic achievement and psychosocial wellbeing outcomes, in order to make comparisons across differing schooling settings. In the second phase, students were again tested on the same variables, so as to allow a longitudinal assessment of any differences across groups.

Analyses from the quantitative phases informed the development of the interview schedules for the qualitative component of the study. In the final phase, focus group interviews were held with students purposefully selected on the basis of their quantitative results (see Participants section) to uncover their experiences of the school environment and gain greater insight into their perceptions about their

achievement and wellbeing. In sum, the use of a synergistic, reflexive, multiple methodological approach allowed for a more enriched understanding of the multifaceted and complex nature of educational phenomena under study to be obtained.

Participants

Overview

Participants were a purposefully selected sample of secondary students from four NSW Department of Education and Communities schools from the Northern and Western Sydney regions. All schools were coeducational, and they were located in similar geographical and educational regions. The four schools included one academically selective school and three comprehensive schools of mixed academic achievement. These two schooling environments were specifically selected in order to investigate how the differing settings impacted on high achieving students' academic and psychosocial outcomes.

Both systems of schooling adhere to an equivalent mandatory curriculum and external examinations. However, the academically selective schools specifically cater to high achieving, academically gifted students. Entry into an academically selective school is based on students' results in the Selective High School Placement Test in English, Mathematics, General Ability, and Writing, in addition to their primary school assessment scores in English and Mathematics (NSW Department of Education and Communities, 2012). Conversely, all students in NSW are entitled to a place in a local comprehensive school, with the enrolment area or zone they belong to being determined by their home address.

Cultural Background

Cultural background was operationalised as Anglo and non-Anglo. The Anglo category included parentage from Australia, Europe, and the USA. The non-Anglo category included parentage from Asia, Melanesia, Africa, and the Middle East. Table 5.1 presents the percentages of students from Anglo and non-Anglo backgrounds for each of the four schools involved in the present study. Furthermore, students who reported a non-Anglo background were, in the great majority, of Asian heritage (86.4%).

Table 5.1

Percentages of Anglo and Non-Anglo Cultures Represented

	Selective School	Comprehensive School A	Comprehensive School B	Comprehensive School C
Anglo	1%	34.5%	72%	41%
Non-Anglo	99%	65.5%	28%	59%

Socio-Economic Background

With regard to socio-economic status, students across the schools reported a similarly high mean level: selective school ($M = 11.84$, $SD = 1.83$), comprehensive school A ($M = 11.16$, $SD = 2.06$), comprehensive school B ($M = 11.63$, $SD = 1.84$), and comprehensive school C ($M = 11.80$, $SD = 1.81$), out of a highest possible score of 14. Additionally, the Index of Community Socio-Educational Advantage (ICSEA), developed by the Australian Curriculum, Assessment and Reporting Authority (ACARA) for the 'My School' website is a value that represents the level of educational advantage for a given school (Australian Curriculum, Assessment and Reporting Authority, 2011).

The ICSEA value is calculated on several variables. The first, family background information, is comprised of parental occupation, parental school education and non-school education levels achieved. The second consists of three school-level characteristics: whether a school is located in a metropolitan, regional, or remote area; the proportion of Indigenous students; and the proportion of students with language backgrounds other than English (Australian Curriculum, Assessment and Reporting Authority, 2011). ICSEA values range from approximately 500 (representing extremely disadvantaged backgrounds) to approximately 1,300 (representing schools with students from very advantaged backgrounds), with an average of 1,000 (Australian Curriculum, Assessment and Reporting Authority, 2011). Each of the four schools scored a similarly above-average ICSEA value of educational advantage: selective school (1,186), comprehensive school A (1,122), comprehensive school B (1,120), and comprehensive school C (1,146) (My School, 2010).

Quantitative Study: Time 1 Sample

In the first wave of data collection for the study, conducted in Term 1, respondents were 1,993 secondary school students in junior high school (Years 7 and 8: 1,065, range: 11–14 years) and middle high-school (Years 9 and 10: 928, range:

13–17 years) from four Australian co-educational high schools. The total sample of respondents was aged between 11 and 17 years, with a mean age of 13.24 years ($SD = 1.18$ years). The sample was almost equally composed of male (996 students) and female (997 students) respondents.

Quantitative Study: Time 2 Sample

The second stage of data collection for this longitudinal study was collected in Term 3 of the same school year. The Time 2 sample comprised 1,752 secondary school students in junior high school (Years 7 and 8: 972, range 11–14 years) and middle secondary school (Years 9 and 10: 781, range 13–17 years) from the same four secondary schools sampled at Time 1. The total sample of respondents at the second time point was aged between 11 and 17 years with a mean age of 13.20 years ($SD = 1.18$ years). Again, the sample was almost equally comprised of male (859 students) and female (894 students) respondents.

Qualitative Study Sample

The qualitative sample consisted of a total of 24 high academically achieving secondary students in Year 10, drawn from the selective and from one comprehensive school, as previously described. Interviews were conducted in the form of four focus groups, with two focus groups of six students conducted within each of the schools. The sample of students was purposively chosen, based on the specific results obtained via the quantitative testing. Students from Year 10 were chosen, as, apart from Year 12, this year represents the most intensive and important year, in terms of standardised academic testing.

Ethical considerations did not permit students from Years 11 and 12 to participate in research studies, due to the amount of preparation required for the Higher School Certificate. The purposive selection and subsequent focus group allocation is described in depth in the next section.

Allocation to Analysis Groups

Quantitative Study

The sample was divided into three groups for the quantitative component of the study: selective students of a high academic achievement level ($n = 432$), high academically achieving students within comprehensive schools ($n = 294$), and students of mixed-achievement levels within comprehensive schools ($n = 1266$). All students from the academically selective school who participated in the study at

Time 1 were included in the analyses and categorised as “selective students”. These students had previously demonstrated their high academic achievement levels via the Selective High School Placement Test, in order to gain entry to the selective school. Moreover, the selective students currently performed in the top 5% of all students within the state, according to the NSW Department of Education and Communities (2013b).

The distribution of the selective school students’ scores on the standardised Mathematics and English achievement tests at Time 1 were utilised, to determine the comprehensive students’ eligibility for and allocation to, either the high achievement comprehensive group or the mixed-achievement comprehensive group. More specifically, when the Mathematics and English achievement scores of the selective school were combined to create an overall achievement score, these scores ranked in the top 15% (85th percentile and above) of the normed scores for the WRAT 4 (Wilkinson & Robertson, 2006). Hence, comprehensive students who scored within the top 15% on the achievement test were allocated to the high achievement comprehensive group. Comprehensive students who did not meet this criterion were allocated to the other achievement level comprehensive group.

Qualitative Study

Twenty-four high academically achieving students were purposefully chosen, on the basis of their academic test results and academic self-concept scores, to participate in the qualitative research interviews. Specifically, within the selective school and comprehensive school involved, two focus groups were conducted. The first was with students who obtained a high academic achievement score in the Mathematics and English test and self-reported a **high** level of self-concept in Mathematics and English; the second was with students who obtained a high academic achievement score in the Mathematics and English tests and self-reported a **low** level of self-concept in Mathematics and English. High academic achievers were identified via the methods outlined in the section above. Students were selected for the self-concept groups based on their average score on the Academic Self-Description Questionnaire II (ASDQII; Marsh, 1990c). The high self-concept group reported an average score of four or above (out of a possible six), and the low self-concept group reported an average score of two or below.

The rationale for this purposive selection hinges on Marsh’s big-fish-little-pond-effect (BFLPE; Marsh, 1991; Marsh & Hau, 2003), which was at the core of

the present investigation. For more than twenty years the BFLPE has demonstrated that students' perceptions of their academic abilities (academic self-concept) are adversely affected by being educated in academically selective environments. Specifically, this research (e.g., Marsh & Hau, 2003; Marsh et al., 2001) has repeatedly established that students who are educated in high-ability environments possess lower academic self-concepts than their equally able counterparts who are educated in low-ability environments. Thus, self-concept was played a vital role in focus group formation.

Instrumentation

Quantitative Instrumentation

A battery of instrumentation was employed to investigate the central research questions. This included a combination of established measures previously tested for strong psychometric properties, and newly adapted measures specific to this study. A standardised achievement test was used to assess students' academic performance in Mathematics and English. A questionnaire battery (see Appendix A) measured various psychosocial constructs, covering: academic self-concept, academic buoyancy, relationships with parents, pressure to achieve, and mental health. The next sections describe each of the measurement instruments in turn.

Academic achievement measure. A standardised achievement test was utilised to assess students' academic performance in English and Mathematics. Standardised achievement measures are deemed more constant and more resistant to short-term changes in students' lives than school grades (Keith, 2002). School grades tend to be distinctive to each teacher, as they grade on a curve, giving higher grades to better-performing students in their class and lower grades to students who perform less well, regardless of the achievement level of the school (see Marsh, 1987a). As such, even when there are substantial differences between classes and schools in terms of student ability, there is little difference between classes and schools in the average grade allocated by individual teachers. If school grades had been used as the academic outcome measure in the present study, there would have been little variation in the achievement levels between the selective and mixed-achievement students, even though achievement in the selective schools would have been higher. Therefore, the use of a standard measure across all students and schools within the present sample was deemed appropriate.

The Wide Ranging Achievement Test 4 (WRAT4; Wilkinson & Robertson, 2006), and its earlier editions have been widely used in a variety of settings to assess the word reading, spelling, sentence comprehension, and mathematical abilities of people aged five to 94 years of age. As such, the Spelling, Sentence Comprehension, and Mathematics subtests of this standardised measure were administered. Due to the need to administer the test in a school hall setting, the Reading subtest (assessing letter and word decoding via correct verbal pronunciation) was omitted, as was the Letter Writing component (assessing the correctness of 13 dictated letters) and a subset of the Sentence Comprehension items relevant only to young school-aged children.

The Spelling subtest of the WRAT4, containing 42 items, was a spelling dictation task wherein students were presented with a word, and the sentence to which it belongs (i.e., the context), followed by the word being repeated again. Students were required to write the word in English on the test paper provided, with one mark allocated for each correct item and a mark of zero allocated to incorrect and missing responses. The words that students were required to spell were Standard English words that would be encountered in the normal course of academic life, dependent of course upon their age and year-level. As such, the words presented increased in difficulty across the 42 items. The Spelling subtest took approximately 15 minutes to complete.

The Sentence Comprehension subtest typically contains 50 items; however, for the current study only 41 items were utilised, as the first nine items apply to younger children. The subtest consisted of one to two sentences with a blank space, to be filled in by the student with one word or two short words, to demonstrate their comprehension of the sentence. Students were required to read the sentences quietly to themselves and were given 8 minutes to complete as many of the sentence comprehension items as possible. One mark was awarded for each written response that demonstrated the student's correct understanding of the meaning of the sentence, while a mark of zero was allocated to incorrect and missing responses. Once again, the items in this subtest were presented in order of increasing difficulty and were designed to reflect comprehension problems encountered by students in the ordinary course of their English instruction—again dependent upon the student's age and year-level at school.

The Mathematics subtest consisted of a written arithmetic component that required students to perform computations through counting, identifying numbers, and solving arithmetic problems. Students were given 13 minutes to complete as many of the 40 items as possible, without the use of a calculator. Again, the items were presented in order of ascending difficulty, and were intended to reflect problems faced by students in the typical course of their Mathematics instruction—again, relative to student age and year-level at school. One mark was allocated for each correct answer, and a mark of zero was allocated for incorrect and missing responses.

The WRAT4 was scored according to the administration manual (Wilkinson & Robertson, 2006). Students received a total score for each of the Spelling, Sentence Comprehension, and Mathematics components, based on their performance on the test. Following the recommendations of Hau and Marsh (2004), an item parcelling procedure was then utilised, in order to create a more reliable and stable measure of achievement. Rather than working with the large amount of Spelling, Sentence Comprehension, and Mathematics items individually, the items were grouped together into logical sets within the three academic domains. Item parcels were then generated by calculating the means of the grouped items (Hau & Marsh, 2004). Thus, seven components represented each of the 42 Spelling and 41 Sentence comprehension items, and ten parcels represented the 40 Mathematics items. The Spelling and Sentence Comprehension parcels were then combined to form an English performance factor, used alongside the Mathematics performance factor as a domain or subject-specific measure throughout all analyses.

Two alternative but equivalent test forms (blue and green) for all three subtests were utilised in the present study—the blue form was used at Time 1 and the green form at Time 2. Previous reliability estimates across the two test forms were excellent, with Cronbach's alpha values ranging from .87 to .93 for the three subscales, and the correlation coefficient of equivalence between the blue and green test forms demonstrating that either form could be used, with analogous results (Wilkinson & Robertson, 2006). The measure has been shown to be reliable and valid for a myriad of age groups and across different educational applications (Wilkinson & Robertson, 2006). Previous versions of the instrument, most specifically the WRAT3 (in which the only difference to the current version is the absence of the Sentence Comprehension subtest), have demonstrated strong content

and construct validity in international (e.g., Roche & Thompson, 2007) and Australian (e.g., Lucas, Carstairs, & Shores, 2003) settings. Furthermore, the WRAT4 has been normed on a US sample of 3,000 participants for individuals aged 5 to 94 years, and students in grades K to 12 (Wilkinson & Robertson, 2006). However, caution is advisable when interpreting the results, as the norms were based on a US sample.

Academic self-concept measure. The Academic Self-Description Questionnaire II (ASDQII; Marsh, 1990b) was specifically developed to measure multiple domains of academic self-concept for adolescents in Years 7 through to 12. Based on the Shavelson et al. (1976) multidimensional model of self-concept (Marsh, 1987b; Marsh & Shavelson, 1985), the ASDQII is a measure of students' ratings of their skills and abilities relevant to particular school subjects. The ASDQII contains 17 different dimensions of academic self-concept, including nine core subject subscales, six non-core subject subscales, one Physical subscale, and one General School subscale. Each subscale consists of six items, and was originally rated on a Likert scale ranging from 1 (*definitely false*) to 8 (*definitely true*). However, for ease of administration, the items were scored on a 1 (*strongly disagree*) to 6 (*strongly agree*) Likert scale in the present study.

As a focus on all subjects was beyond the scope of the present investigation, only the English and Mathematics self-concept scales were used in the present study. The English and Mathematics subscales include items such as "I get good marks in English" and "I learn things quickly in Mathematics". The Self-Description Questionnaire (SDQ) family of instruments, of which the ASDQII is a part, consistently possess strong psychometric properties (Byrne, 1996; Byrne & Shavelson, 1996; Hattie, 1992; Wylie, 1989) and are widely recognised as the best measures of multiple dimensions of self-concept. Each of the facets of self-concept measured by the ASDQII has undergone rigorous investigation, demonstrating sound factor structure and excellent reliability estimates, with Cronbach's alpha values ranging from .89 to .95 (Marsh, 1990c).

General School and Parent Relations self-concept measure. Parallel to the ASDQII, the Self-Description Questionnaire II Short (SDQII-S; Marsh, Ellis, et al., 2005) instrument was also grounded in the Shavelson et al. (1976) theory of self-concept, and was designed to measure multidimensional facets of self-concept for adolescents. The SDQII-S has 11 subscales, including three areas of academic self-

concept, two areas of physical self-concept, three areas of relationship self-concept, and also subscales measuring Emotional Stability, Honesty/Trustworthiness, and General self-concept. Each scale contains four items measured on a 1 (*strongly disagree*) to 6 (*strongly agree*) Likert scale. For the present investigation, the Parental Relations and General School scales were utilised: these contained items including “I get along well with my parents” and “I get bad marks in most school subjects”. The SDQII-S instrument has demonstrated strong psychometric properties in varied research settings, with a robust factor structure and Cronbach’s alpha values ranging from .80 to .90 (Ellis, Marsh, & Richards, 2002; Marsh, Ellis, et al., 2005).

Academic buoyancy measure. The Academic Buoyancy Scale (ABS; Martin & Marsh, 2006) was utilised to measure a student’s ability to successfully deal with setbacks, challenges, adversity, and pressure in the course of school life. In its original form, the ABS was a six-item, single factor scale that referred generally to ‘school work’ challenges (e.g., “I think I am good at dealing with school work pressures”). As the current study had a domain-specific focus, the ABS was altered to encompass two subscales of six items each that specifically referred to English and Mathematics challenges, containing items such as “I believe I am mentally tough when it comes to English exams” and “I’m good at bouncing back from a poor Maths mark”. The domain-specific items were drawn directly from the original items, but with the word ‘school work’ simply substituted with the terms ‘English’ or ‘Mathematics’. Students responded to the 12 items on a 6-point Likert response scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Previous research (Martin & Marsh, 2006; 2008a) utilising the ABS in its original single-dimension form has demonstrated support for its psychometric strength, via a sound factor structure and strong reliability, with Cronbach’s alpha .89. The psychometric properties of the adapted two-factor model are evaluated and presented in Chapter 6.

Pressure to achieve measure. A newly revised version of the Index of Achievement Press (IAP; Organisation for Economic Cooperation and Development, 2002) was utilised to measure the degree to which students reported experiencing pressure from their parents and teachers to perform at a higher academic standard. In its original form, the IAP was a 4-item, single factor instrument designed to measure Teacher pressure to achieve (e.g., “My teachers tell me that I can do better”). However, it was modified for the present study to also measure Parental pressure to achieve, including items such as “My parents want me to work hard”. The newly

developed items were adapted directly from the existing teacher scale items, leading to a two-factor, eight-item scale. The items were measured on a six-point Likert response scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Prior research has supported the factor structure of the original instrument; however, only moderate internal consistency levels were reported, with the average Cronbach's alpha value of .54 falling below the required .70 (Adams & Wu, 2002). As the instrument had a solid factor structure, and was re-developed for the present study, it was deemed appropriate for use. The psychometric properties of the newly adapted two-factor model are assessed and displayed in Chapter 6.

Depression and Anxiety measure. The Depression, Anxiety, and Stress Scales 21 (DASS-21; Lovibond & Lovibond, 1995) was designed to measure negative mental health states. The DASS-21 is traditionally a three-factor, 21-item scale. However, previous research has demonstrated that it may be difficult to distinguish between the symptoms of depression, anxiety, and stress in young people (Cole, Truglio, & Peeke, 1997; Lahey et al., 2004; Szabo, 2010). In particular, high and potentially problematic correlations between the Anxiety and Stress scales, and Depression and Stress Scales have been found, suggesting that the Stress factor may not be differentiated from the other two factors (Griezel, 2007). As such, the Depression and Anxiety scales were selected for use in the current study. The Depression scale measures dysphoria, lethargy, despondency, self-deprecation, disinterest, and lack of positive affect, with items including "I felt that I had nothing to look forward to". The Anxiety scale assesses subjective bodily symptoms of fear, such as autonomic arousal, and contains items such as "I felt scared without any good reason".

Participants indicated their responses to the 14 items with reference to their experiences over the past week on a 4-point Likert response scale from 0 (*did not apply to me at all*) to 3 (*applied to me very much or most of the time*). The DASS21 has exhibited predominantly good psychometric properties, in both clinical and non-clinical samples and across diagnostic and research purposes (Antony, Bieling, Cox, Enns, & Swinson, 1998). Specifically, the factor structure of the scale has been supported and found to have good discriminant validity in a majority of studies (Antony et al., 1998; Bados, Solanas, & Andrés, 2005; Lovibond & Lovibond, 1995). However, Henry and Crawford (2005) reported high correlations and thus a significant amount of shared variance among the Depression, Anxiety, and Stress

Factors, and suggested that there may be a general psychological distress factor underlying the three factors. Reliability estimates for the depression subscale range between .84 and .94, and for the anxiety subscale between .70 and .87 (Antony et al., 1998; Bados et al., 2005).

Demographic characteristics. In addition to the instrumentation described previously, participants were also asked to provide a range of general demographic information, including their age, grade, and gender. In order to gauge the cultural composition of the sample, students were asked to indicate their country of birth and the country of birth of their mother and father. The nominated countries were then organised and classified according to the Standard Australian Classification of Countries (Australian Bureau of Statistics, 2008).

Additionally, the Household Possessions Indices (HPI; Organisation for Economic Cooperation and Development, 2005) was utilised to measure family wealth and indicate socio-economic status. Students were required to report the availability of 13 different household possessions within their family home. The items reflected four aspects, including Computer Facilities (e.g., “In your home, do you have a computer you can use for school work?”), Cultural Possessions (e.g., “In your home, do you have books of poetry?”), Home Educational Resources (e.g., “In your home, do you have books to help you with your school work?”), and General Home Possessions (e.g., “In your home, do you have a room of your own?”). The HPI items were scored on a dichotomous response scale of 1 (*no*) or 2 (*yes*). Previous research has shown the HPI to be valid and reliable, with a Cronbach’s alpha value of .75 (Organisation for Economic Cooperation and Development, 2005).

Qualitative Instrumentation

Four focus groups were utilised, to interview students of a high academic standard from the participating academically selective school and a mixed-achievement comprehensive school. Unlike individual interviews, which can disconnect individuals from their social setting, focus groups build a social space that encourages and enables participants to interact and connect with each other, producing data and knowledge otherwise unreachable to the researcher (Robinson, 2012).

Within the focus group format, semi-structured interviews were employed to collect the qualitative data. The semi-structured interview technique relies upon a set of key target areas, or a ‘topic guide’, and a central group of questions that are used

to guide the interview towards an interactive conversation, whilst remaining grounded in the pre-determined areas of focus (Hesse-Biber & Leavy, 2010; Robinson, 2012). This type of interview technique permits respondents the freedom and flexibility to raise issues of importance to them as they arise organically, allowing the conversation to flow naturally and in varied directions, while still ensuring the key areas are covered (Bogdan & Biklan, 1992; Patton, 2002). Moreover, if themes were not anticipated by the researcher emerge, the semi-structured interview allows for the generation of spontaneous questions by the interviewer, to explore new topics (Hesse-Biber & Leavy, 2010). The combination of focus groups and a semi-structured approach to interviewing means that the interviewer should function more as a moderator or facilitator, enabling the interaction to take place (Robinson, 2012).

The overarching aim of the qualitative component of research was to gain an understanding of the high academically achieving students' experiences and perceptions of their educational environment, their academic achievement, and psychosocial wellbeing, and the complex interplay between these constructs. In the present investigation, the researcher sought to investigate some a priori assumptions: at the same time, participants were allowed the flexibility to raise and explore unanticipated issues and ideas throughout the interview process. Thus, focus groups and the semi-structured interview were chosen, to best meet the research needs. This provided a balance between the competing requirements of consistency in questioning across interviews, and thus generalisability of results, and the desire to allow interviewers and interviewees the freedom to explore emergent issues within an interactive setting (Patton, 2002).

To address the research questions posed in Chapter 4, and to extend the quantitative findings, the semi-structured interview schedule contained questions examining school life, including: relationships with teachers, relationships with parents, and the extent to which they felt pressure to achieve academically. Next, students were asked about their self-perceptions of their Mathematics and English performance, and how buoyant they were when facing challenges and setbacks at school. To assess aspects of mental health, participants were also asked about any feelings and experiences of depression or anxiety related to school and their achievement. Finally, a generalised question asked students about negative and positive aspects of school life. It was hoped that the interviews would uncover the

interaction between these key areas and the educational settings in which these high achieving students were situated, and also the extent to which students' experiences were similar or different according to their school environment.

The interview schedule took the form of a topic guide, listing the areas to be tapped that specifically related to the posed research questions, so as to orient the interviewer to the focal aspects to be covered (Patton, 2002; Robinson, 2012). In each key area, one or two core questions were specified, with some prompts to use where required. The facilitator was free to deviate from the guide at any time, to follow additional issues raised by the participants, to spontaneously generate questions in response to interview content, and to explore the key areas in whichever order the interview dictated. The moderator referred back to the guide throughout the interview process, to ensure the interviews remained on track. The semi-structured interview guide is included in Appendix B.

Procedures

Ethics Approval

Ethics approval was sought and granted by the University of Western Sydney Human Research Ethics Committee (see Appendix C). Subsequently, approval was obtained from the NSW Department of Education and Communities via the State Education Research Approval Process (see Appendix D). The Department of Education and Communities undertook the required child protection screening for all researchers involved in the present study.

School Recruitment and Participant Consent

Schools of interest were identified via meetings with Department of Education and Communities officials, to ensure a good representation of high academically achieving students within the comprehensive schools. The desired schools were subsequently contacted by the researcher, and informed of the nature of the study and the implications of their involvement. Following this initial contact, the researcher and an academic colleague visited each school to describe the study and research process in-depth to the principals and to the executive teaching body. Each school principal was presented with a detailed information sheet (see Appendix E) and consent form (see Appendix F). School principals made the final decision as to whether the school would participate. School participation was completely voluntary, and failure to participate did not affect the school in any way. Each school contacted

consented to participating in the study. Subsequent to the principal's agreement to participate in the study, each school was sent a package containing the information and consent forms (see Appendix G and H respectively) for the parents/guardians of students. Only students with parental consent to participate were included in the study.

Quantitative Procedure: Time 1 and Time 2

Prior to the administration day, all consent forms were collated and the surveys were pre-coded with students' names and an individual student code. The researcher and selected research assistants attended the schools to administer the surveys. Students themselves also needed to indicate their consent to participate, on the survey provided. The surveys were administered to year groups in the school hall. Before beginning the questionnaire, all students were informed of the purpose of the survey, the use to which the data would be put, and the confidential nature of the data.

The first component of the questionnaire administered to students was the battery of items assessing: academic, general school, and parent relations self-concept, academic buoyancy, pressure to achieve, depression, anxiety, and demographic characteristics. The research assistant first explained the rating scale of the items and provided a sample question. The survey was then read aloud to students via a microphone by an experienced researcher. This method ensured that all students completed the survey within the allotted time frame, and served to overcome potential reading and language problems experienced by students.

Upon completion of the first component of the survey, the standardised achievement test was administered to the students. For the Mathematics section, students were instructed to complete as many of the items as they could in the 13 minutes provided. Students were directed to complete the calculations by hand (without a calculator) and to write all answers in the designated space (a clear sheet for working out was also made available within the survey booklet). With regard to the Spelling component, the researcher read aloud the target word, gave an example of the word's use in a contextual sentence, and repeated the word once more. Students were allowed approximately 15 seconds to spell the target word in the space provided. Once the Spelling component was complete, students were then directed to self-complete the Sentence Comprehension subtest. Students were instructed to read each sentence, and to generate a word to fill the blank space contained within each

statement, to complete its meaning. Eight minutes was allowed to complete as many items as possible.

Upon completion of the assessment battery, all students were thanked for their time, and the survey and test responses were collected and collated by the research assistants. The cover sheet containing the name of the student was discarded, while the second page, containing the unique identification number remained. This allowed student responses to be paired at Time 1 and Time 2, whilst ensuring the de-identification of all participants. Surveys were kept in a locked data storage cabinet.

Qualitative Procedure

The collection of the qualitative data was conducted via four, 45–60 minute focus groups using a semi-structured interview format. The researcher contacted each school principal in order to organise a suitable day and time to conduct the interviews. Additionally, the principals were advised of the names of the students who had been purposefully selected for the focus group interviews, and who had parental consent to participate. Principals and students were not informed as to the selection criteria. The students were then invited to participate in the interviews by the school principal.

The researcher took on the role of moderator and conducted the focus groups. An academic colleague was also present, as an observer, to take any additional notes, list the names of speakers in sequential order, and to contribute to the interview questioning, as desired (Robinson, 2012). The focus group interviews were recorded via the computer-recording program Audacity®, and a digital recorder was also used as a backup device (Robinson, 2012). Prior to commencement of the interviews, a brief introduction to the purpose of the study was provided. Although consent had been sought at the beginning of the study, via a signed consent form, each student was again required to give his or her written consent, once they understood the nature of the interviews. The students were reminded that their participation was voluntary, and that they were free to withdraw at any time without penalty. Additionally, participants were advised that their interviews would be de-identified, and assured that all transcripts would remain confidential. At the end of each interview, students were given details on how to contact the school counsellor if required.

It was common for the researcher and the students to engage in some informal conversation once the formal interview was completed, and notes were

taken to that effect, with the permission of the students involved. The researcher and colleague debriefed each other following each interview, and discussed their thoughts about the interviews, as recommended by Patton (2002). The researcher also spent time writing down any ideas, interpretations, and observations that emerged following the interviews, in a research diary (Patton, 2002; Robinson, 2012).

Data Analysis

Quantitative Data Analysis

Data screening. All data were initially entered and screened in SPSS Version 17 (SPSS Incorporated, 2008) to check for univariate and multivariate outliers and for assumptions of normality, linearity, and homoscedasticity (Hills, 2008; Tabachnick & Fidell, 2007). Data screening showed the presence of univariate and multivariate outliers in the raw data. Initially, a procedure suggested by Tabachnick and Fidell (2007) for dealing with outliers, was considered. This procedure entails converting raw scores into standardised scores (z-scores) to identify extreme scores. Raw scores with an absolute z-score value greater than 3.29 are considered univariate outliers and are modified to one unit more extreme than the next most extreme score (Tabachnick & Fidell, 2007).

It is often necessary to repeat this procedure as with each modification the distribution of scores changes, thereby potentially producing new outliers. A problem with this approach is that if scores meeting the criteria of an outlier in the procedure suggested by Tabachnick and Fidell (2007) are modified, this results in reducing the variance of the data considerably. As variance of data is crucial, this approach to modifying outliers was re-examined. Adopting the advice of H. W. Marsh (personal communication, December 9, 2010) outliers should not be discarded unless it is clear that the responses are incorrect. As such, the questionnaires were visually inspected for any occurrences of patterned responding, resulting in the removal of one participant from Time 1, and two participants from Time 2. Thus, the final Time 1 and Time 2 datasets contained 1,992 and 1,750 participants respectively.

In dealing with randomly missing data, the Expectation Maximization (EM) algorithm recommended by Tabachnick and Fidell (2007), which predicts replacement values based on available information from data not missing for the particular item, was used in the present investigation. EM currently represents one of

the best methods for the replacement of missing data, as it does not result in a large loss of participants or a loss in variance, which does occur with the more traditional methods of listwise deletion or mean replacement (Schafer & Graham, 2002).

Reliability analyses. A series of reliability analyses was conducted using SPSS Version 17 (SPSS Incorporated, 2008) for all subscales within the instrumentation utilised at Time 1 and Time 2: Mathematics, Spelling, and Sentence Comprehension achievement, Mathematics and English academic self-concept, General School and Parent Relations self-concept, Teacher and Parent pressure to achieve, Mathematics and English academic buoyancy, Depression, and Anxiety. Reliability is a measure of the extent to which a set of items within a scale are internally consistent, and the degree to which they can be deemed to be measuring a unitary construct (Anastasi & Urbina, 1997).

The Cronbach's alpha statistic is the most common method for measuring the internal consistency reliability of a scale, and is calculated by obtaining the mean of the correlations between items within a given scale (Cronbach & Shavelson, 2004; Hills, 2008). Reliability coefficients range between zero and one; the higher the value the more reliable the factor is considered to be. Cronbach's alpha values of .70 or greater are deemed an acceptable level of reliability for research purposes (Hills, 2008; Tabachnick & Fidell, 2007). Additionally, it has been argued that alphas above .60 are acceptable in exploratory research (Nunnally, 1978). As such, the present study emphasised values above .70; and values above .60 were accepted but interpreted with caution.

Confirmatory Factor Analysis. In addition to assessing and establishing the reliability of each subscale, it was also imperative to validate the underlying factor structure of the instrumentation via Confirmatory Factor Analysis (CFA) using Mplus Version 5.1 (Muthén & Muthén, 2008). CFAs were carried out for Time 1 and Time 2 data on: the three-factor WRAT4, the two factors of the ASDQII, the two factors of the SDQII-S, the two-factor IAP, the two-factor ABS, and the two factors of the DASS-21.

A model of the relations between the observed indicators or items and the latent factors—i.e., the factor structure of the instrument—is proposed a priori, based on theory or empirical evidence (Byrne, 1998). CFA then allows the researcher to test the extent to which the theoretically derived relations specified in the a priori hypothesised structure actually manifest in the empirical data (Byrne, 2001). Put

simply, CFA is used to investigate whether the established dimensionality and factor-loading pattern of an instrument fits a sample from a new population (Muthén & Muthén, 1998-2007). The CFA technique requires the researcher to specify or model the precise items that combine to form the latent factors (Fleishman & Benson, 1987; Quintana & Maxwell, 1999). Through CFA, the researcher is then able to test the ability of the model to fit the data, based on the proposed structure, by demonstrating the following: the parameter estimates are consistent with theory and a priori predictions; the solution is well defined; and the chi square and indices of fit are acceptable (Byrne, 1998; Marsh, Balla, & McDonald, 1988; McDonald & Marsh, 1990). Once the structure of the model has been estimated, the researcher is required to assess the extent to which the goodness-of-fit indices produced by Mplus represent the actual data—a process often termed model fitting.

In evaluating the goodness-of-fit indices produced by Mplus to assess model fit, current practice (Hu & Bentler, 1995; Marsh, Balla, & Hau, 1996; Marsh, Balla, et al., 1988; Marsh, Hau, & Wen, 2004; Yuan, 2005) recommends the following indices be emphasised: the Root Mean Square Error of Approximation (RMSEA; Browne & Cudeck, 1993), the Tucker Lewis Index (TLI; Bentler & Bonett, 1980), and the Comparative Fit Index (CFI; Bentler, 1990). For the RMSEA index, values below .08 and .05 are considered to reflect acceptable and excellent fits respectively (Browne & Cudeck, 1993; Marsh et al., 1996; Schumacker & Lomax, 1996; Yuan, 2005). The TLI and CFI yield values that range from zero to one, with values greater than .95 indicative of excellent fit, and values greater than .90 indicative of acceptable model fit (Marsh et al., 1996; Schumacker & Lomax, 1996).

The CFI statistic contains no penalty for lack of parsimony, so that excellent model fit may be due to the specification of more parameters and thus may be a capitalisation on chance (Holmes-Smith, 2000). However, the RMSEA and TLI statistics include a penalty for lack of parsimony, and thus a more complex model may generate lower values for these two indices, compared to the CFI (Holmes-Smith, 2000; Yuan, 2005). Ultimately though, fit indices and cut-off values should serve only as a guide to aid model evaluation; a degree of subjectivity and professional judgement must be used in selecting the best fitting model (Marsh, 2007a).

Consideration must also be given to the use of parallel items in CFA. Parallel data such as items within a scale containing equivalent wording (e.g., English and

Mathematics academic buoyancy parallel items) present statistical problems specific to their structure. Essentially, the measurement errors related to the matching items across domains are likely to be correlated, resulting in biased parameter estimates (Martin, 2008). Hence, Martin (2008) recommends that not only should the factors be correlated in CFA, but so too should the parallel item uniquenesses. Correlated uniquenesses however must be posited a priori and on the basis of the contents of the instrument (Martin, 2008). As such, a priori determined correlated uniquenesses were permitted within CFA for all instruments containing parallel worded items in the present investigation.

Factorial invariance testing. After establishing the validity of each instrument's factor structure, it was vital to investigate whether the factor structure remained the same across critical sub-groups within the sample, via factorial invariance testing (Byrne, 1998) conducted within Mplus Version 5.1 (Muthén & Muthén, 2008). Most research has focused on comparing various sub-groups of interest with regard to mean-level differences across various measures. However, scarce consideration has been given to testing whether the measures themselves are comparable in factor structure and meaning across the particular groups (Byrne, 2003; Byrne & Campbell, 1999; Martin, 2007; Vandenberg & Lance, 2000). Factorial invariance testing offers an extension of CFA findings by establishing whether or not the factor structure remains consistent across sub-groups of interest within a larger sample (MacCallum & Austin, 2000; Marsh, 1994). This is of particular importance when the legitimacy of comparisons between groups rests on the assumption that the equivalent construct is being measured in the differing groups.

Marsh (1993) extended upon this point, outlining that investigations of factor invariance are justified, as it may not be justifiable or legitimate to pool data across sub-groups unless there is sufficient support for the invariance of factor structure across those groups. The present study assessed the factorial invariance of the WRAT4, ASDQII subscales, SDQII-S subscales, IAP, ABS, and the DASS-21 subscales across gender, year-level groups (lower: Years 7 and 8; middle: Years 9 and 10), and school setting/academic achievement groups (selective, high achievement comprehensive, and other achievement comprehensive).

Following the specification of a hypothesised factor structure of an instrument, a succession of logically structured and increasingly stringent models is

carried out whereby any one, or set, of parameters is held invariant across groups and compared to a model of no constraints (Byrne, 2004). The first model contained no constraints, being completely free across groups, and was used as the baseline model (Model 1). The second model held factor loadings invariant across groups (Model 2). The third model held factor loadings and factor variances and covariances invariant (Model 3), whilst the fourth model held factor loadings and uniquenesses invariant across groups (Model 4). In the fifth and final model, all parameter estimates (i.e., factor loadings, factor variances and covariances, and uniquenesses) were held invariant across groups (Model 5).

The baseline model was then compared with the four successive models; with emphasis on the CFI statistic, changes in the goodness-of-fit indices between the models must not exceed .01 to meet the requirements of factorial invariance across groups (Cheung & Rensvold, 2002). The minimal requirement for factorial invariance is typically considered to be equivalence in factor loadings across groups (Byrne, 1998; Cheung & Rensvold, 2002). Therefore, invariance of factor loadings, as indicated by a change in the CFI of less than .01 between the baseline model and Model 2, was emphasised in the current study to demonstrate invariance across gender, year-level, and academic achievement groupings.

Structural Equation Modelling. Structural Equation Modelling (SEM) is a statistical technique that examines the relations between a number of predictor and outcome variables (Byrne, 1998). SEM has two components. The first is a measurement component, which examines the relations between the observed variables (the indicator items) and a set of latent constructs (the factors), assessed through CFA, as described earlier (Byrne, 1998; Kline, 1998; Muthén & Muthén, 1998-2007). Unlike CFA, the second component of SEM is a structural model that examines substantive questions about the interrelations between latent variables (Byrne, 1998; Hoyle, 1995; Kline, 1998).

When data are longitudinal, containing repeated measures of the constructs under study, causal ordering within SEM is possible. Specifically, by utilising repeated measures, one can assess the degree to which a predictor variable at Time 1 may cause a separate outcome at Time 2, once the predictive power of that outcome variable upon itself (from Time 1 to Time 2) has been accounted for (Byrne, 1998). The advantage of using SEM over traditional regression techniques is that it estimates the latent constructs expunged of measurement error, and allows the

researcher to use numerous dependent variables within a single model (Kline, 1998). Various techniques that fall under the SEM umbrella were utilised to conduct the three main groups of analyses required to answer the hypotheses and research questions pertaining to Study 2. Each is now detailed in turn.

Comparisons between groups. In order to assess the impact of diverse educational settings on achievement and wellbeing, longitudinal comparisons between student school setting/academic achievement groups on the student outcomes were conducted. This was the first group of analyses. The creation of these groups has been explained in the section entitled “Allocation to Analysis Groups”. The comparisons made were: (i) selective students compared to high achieving comprehensive students; and (ii) high achieving comprehensive students compared to other achievement comprehensive students. To avoid issues of multicollinearity and suppression effects, the comparisons were conducted separately across each construct.

As students within the sample differed in terms of SES and cultural background, each model included these variables, so that they were statistically controlled for. Additionally, prior academic achievement at Time 1 was also controlled for with academically oriented constructs. As stipulated by Marsh, Byrne, and Yeung (1999), the uniquenesses between items repeated across time waves were correlated, to avoid method halo effects. As Marsh and O’Mara (2008) outline, not controlling for this error structure via the use of correlated uniquenesses would produce positively biased estimates of stability over time and distorted parameter estimates. Hence, a priori correlated errors were permitted between Time 1 and Time 2 matched items within the SEM analyses.

Analyses were conducted in terms of total effects and change over time (Bollen, 1987; Pearl, 2001). Firstly, total effects consider any differences at each time point, without controlling for previous levels of the specific construct under consideration, such that each time point is studied in isolation of results at previous time points (Bollen, 1987). Consider an example model conducted in the present study, which investigated the effect of being a high achieving student in a selective school compared to a high achieving student in a comprehensive school on Mathematics self-concept at Time 1 and Time 2. When total effects are examined, this refers to the effect of schooling environment on self-concept at Time 1 and Time

2, controlling for SES, cultural background, and prior Mathematics achievement at Time 1 only. Figure 5.2 depicts these total effects.

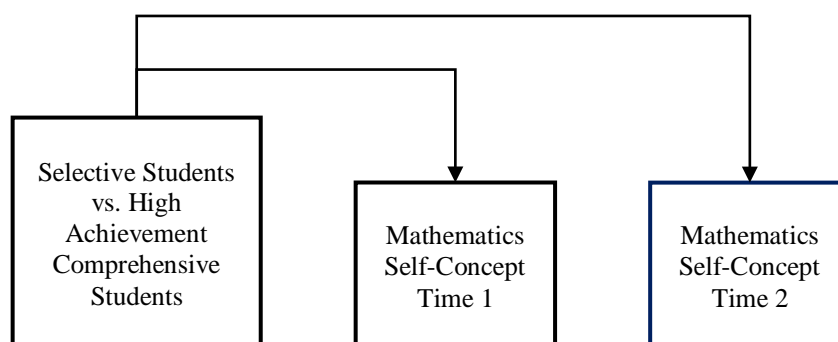


Figure 5.2. Example of a total effects analysis conducted for the comparisons between school setting/achievement groups for Mathematics self-concept outcomes. The covariates of SES, cultural background, and Time 1 Mathematics achievement were also specified in this model; however, for purposes of clarity they are not included here.

Change over time, however, does take into account differences in the construct being considered that may have occurred at previous time points, such that any effect found at Time 2 is over and above that found at Time 1 and thus represents change from Time 1 to Time 2 (Bollen, 1987). Using the above example, change over time for Mathematics self-concept refers to the impact of school setting on Mathematics self-concept at Time 2, controlling for SES, cultural background, Time 1 Mathematics achievement, *and* Time 1 Mathematics self-concept. That is, any significant effect at Time 2 indicates growth over and above any effect found at Time 1, signifying an increase from Time 1 to Time 2. Figure 5.3 depicts a change over time analysis.

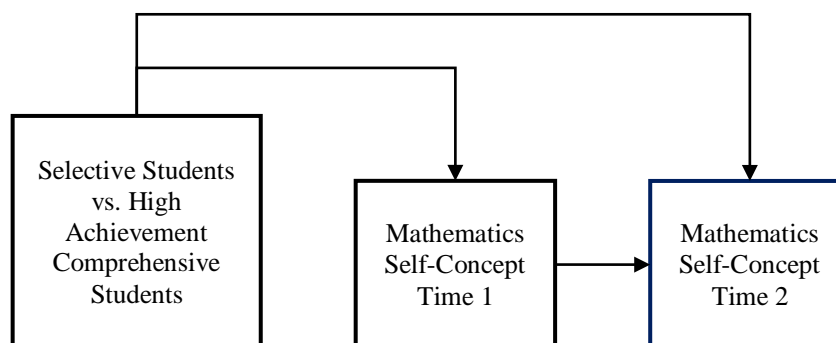


Figure 5.3. Example of a change over time analysis conducted for the comparisons between school setting/achievement groups for Mathematics self-concept outcomes. The covariates of SES, cultural background, and Time 1 Mathematics achievement were also specified in this model: however, for purposes of clarity they are not included here.

Multi-group moderating analyses. A moderating analysis within SEM is a combination of traditional invariance testing and path analysis, wherein the predictive paths between a set of constructs are simultaneously estimated and tested to determine whether they differ across groups (Byrne, 2011). Using an invariance testing strategy, a researcher is able to test for the replicability of the structural regression or predictive paths across groups. In the current study, for each model tested the factor loadings were held to be equal across groups (this is the minimal requirement for invariance; Byrne, 1998; Cheung & Rensvold, 2002), in addition to the structural predictive paths, which were also constrained to be equal.

To determine whether the parameters were operating equivalently across groups, a Wald chi-square test of parameter equalities (Muthén & Muthén, 1998-2007) was then carried out. This omnibus test identified whether or not there were differences in the predictive paths between the groups. A non-significant Wald statistic indicates that the structural paths are similar across groups. A significant Wald statistic indicates a difference *somewhere* in the predictive paths between groups. In order to ascertain where the specific differences lay, pair-wise post-hoc comparisons were performed between the groups. In the present study, multi-group moderating analyses were utilised to investigate the second and third main group of analyses.

The second set of analyses involved examining the longitudinal predictive relations between the Time 1 psychosocial variables and the Time 2 academic achievement outcomes, and vice versa the relations between the Time 1 academic achievement measures and the Time 2 psychosocial wellbeing constructs, for the selective, high achievement comprehensive, and other achievement comprehensive student groups, controlling for differences in SES and cultural background. Moderating analysis investigated whether the predictive relations were similar or different across each group. Once again, to overcome potential problems with multicollinearity and suppression effects, the models were conducted separately for each construct. Each model tested was conducted in the format of a reciprocal effects model (REM; Marsh, 1990a; Marsh & Martin, 2011; Marsh & Yeung, 1997a), simultaneously estimated across the three groups.

These autoregressive cross-lagged structural equation models (Curran & Bollen, 2001) test the effect on a measure at a particular time point of: (a) the same measure at the prior time point (the autoregressive part of the model); and (b) another measure at the prior time point (the cross-lagged part of the model; Curran & Bollen, 2001; Hong, Yoo, You, & Wu, 2010). For example, Mathematics achievement at Time 2 was regressed on Mathematics achievement at Time 1, and simultaneously on Mathematics self-concept at Time 1. Hence, the model indicates the stability in achievement over the lag (autoregressive path), whilst the cross-lagged path demonstrates whether Mathematics self-concept at Time 1 predicts change in Mathematics achievement at Time 2, over and above Mathematics achievement at Time 1 (Robitaille, Oprana, & McIntosh, 2012). An example analysis is depicted in Figure 5.4.

The third and final group of quantitative analyses were added to this investigation post-hoc, due to findings emerging from the qualitative interview data. Specifically, the student interviews revealed that cultural background played an integral role in the students' achievement and key wellbeing factors, namely: academic self-concept, parental relations, and parental pressure to achieve. As such, it was deemed important to investigate this impact within the quantitative data. Cultural background was operationalised as Anglo and non-Anglo, and the demographic data indicated that the non-Anglo group was comprised predominantly of students of self-identified Asian heritage (see previous section entitled "Participants" in this chapter).

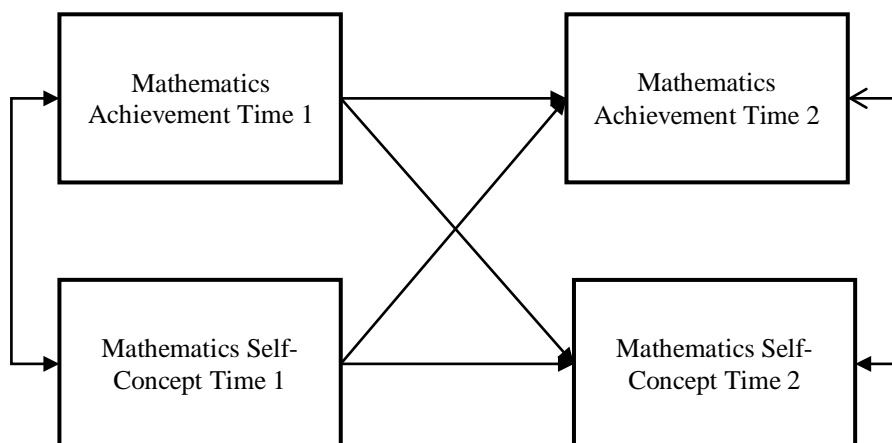


Figure 5.4. Example of a model investigating the reciprocal relations between Mathematics self-concept and Mathematics achievement across the school year. Using a multi-group method, this model was simultaneously estimated for the selective, high achievement comprehensive, and other achievement comprehensive groups. The covariates of SES and cultural background were also specified in this model: however, for purposes of clarity they are not included here.

Multi-group moderating analyses were conducted, as explained above, to determine whether there were differences between students of an Anglo Australian and non-Anglo Australian background on academic achievement and select psychosocial outcomes across the student academic achievement groups, and whether the strength of the predictive paths varied across the groups. Analyses were again conducted in terms of total effects and change over time. Comparisons were conducted between the high achieving comprehensive students and the other achieving comprehensive student groups only. The selective student group contained only five participants of an Anglo Australian background. Thus, this violated the sample size requirements of five participants per questionnaire item within each group (Hills, 2008).

Qualitative Data Analysis

Data authentication. The digital recordings from each of the focus group interviews were transcribed verbatim via a transcription service. In order to authenticate the transcripts, the researcher listened to each audio recording whilst simultaneously reading the transcript to ensure the accuracy of the transcription. The researcher was able to clarify where text was missed or misinterpreted by the

transcription service, which of the interview participants was speaking, and to clarify mumbled phrases and words. After the authenticity of the transcripts had been verified, the researcher consulted the research diary containing post-interview reflections, and added to the transcripts any additional observations from the day. The researcher read each of the transcripts multiple times before the commencement of the thematic analysis, to ensure familiarity with the interview content.

Data analysis. In accordance with Miles and Huberman (1994), the analysis of the qualitative data was undertaken in three processes, which were not sequential steps: rather, they happened simultaneously and repeatedly. The first process of data reduction involved summarising, sorting, organising, focusing, and transforming interview transcripts. Data display refers to the creation of an organised assembly of the relationships and connections between parts of the data and their themes, so as to allow understanding of the data. The final process, of conclusion drawing and verification, encompassed testing of the themes and meanings that emerged from the analysis via cross-examination of the data and triangulation with other sources of data. This section now turns to description of the methodology and tools utilised to conduct the qualitative data analysis within the processes described by Miles and Huberman (1994).

Thematic analysis is a search for themes that emerge as essential to the description of the phenomenon under study (Daly, Kellehear, & Gliksman, 1997; Patton, 2002). It allows the researcher to identify, analyse, and report themes and patterns of meaning within the data, and to interpret such patterns not in isolation but within the context of the data as a whole (Braun & Clark, 2006). Through the method of thematic analysis, an iterative coding process was utilised as a tool for reducing the data (Boyatzis, 1998). Coding alternated repeatedly between a top-down or deductive approach, and a bottom-up or inductive approach wherein a priori codes were imposed on the data (Crabtree & Miller, 1999), and relevant elements that emerged from the data were added to the coding scheme (Boyatzis, 1998). This approach complemented the research aims, by allowing codes developed a priori on the basis of the research questions and theoretical framework to be imposed, while still permitting themes to emerge organically from the data.

The process of manual data coding and generation of themes was a comprehensive one, covering six key steps (Braun & Clark, 2006). The researcher and an experienced colleague coded the data, and inter-rater reliability checks were

conducted to enhance the reliability of the coding (Patton, 2002). Initially, the researcher began reading and re-reading the transcripts, noting recurrent ideas and thoughts. This is known as familiarising yourself with the data (Braun & Clark, 2006) or pre-coding (Saldaña, 2009). Significant participant quotes or passages worthy of attention were highlighted and preliminary jottings and notes were made, marking ideas for coding (Braun & Clark, 2006; Saldaña, 2009). Next the researcher moved on to the generation of codes. As per Crabtree and Miller (1999), an *a priori* list of codes based on the research questions—a coding template—was employed alongside emergent coding (Boyatzis, 1998).

The data were coded in two cycles. First cycle coding appointed a word or short phrase written in the transcript margin that described a summative, significant, essence-capturing, or evocative characteristic for a fragment of the interview transcript (Saldaña, 2009). Second cycle coding was a more focused process wherein codes were organised, collated, and conceptualised into broader categories, leading towards a coherent picture of the data set (Saldaña, 2009). The primary goal of second cycle coding is to begin to develop a sense of the thematic organisation of the interview data. Essentially, first cycle codes are reorganised and refined, with some codes subsumed by other codes, relabelled, or dropped altogether, to move towards a polished list of broader categories (Boyatzis, 1998; Braun & Clark, 2006).

Next, the codes were collated and organised into themes—the higher-level more abstract constructs—in the third step of searching for themes (Braun & Clark, 2006). Essentially, the researcher analysed all codes and considered how different codes linked and combined to form an overarching theme. The researcher thought about the relations between codes, between themes, and between different levels of themes. Some codes were used to inform overarching themes, and others formed sub-themes within them, while others were discarded (Boyatzis, 1998; Braun & Clark, 2006). Closely linked to this, the step of theme reviewing (Braun & Clark, 2006) involved the use of a visual representation to help display the data (Miles & Huberman, 1994). A thematic map of the analysis was created, to ensure that an accurate and meaningful representation of the data set was generated.

In the next phase, overarching themes and sub-themes were defined and named with regard to their meaning and according to which aspect of the data was captured (Braun & Clark, 2006; Saldaña, 2009). Once again, the researcher revisited the coded transcript, in order to write a detailed narrative of each theme, to develop a

wider analysis and interpretation of the meaning of themes, as well as the interrelationship between themes and how they fit into the overall picture (Braun & Clark, 2006). Extract examples from the interview transcripts were selected to provide evidence for the themes (Boyatzis, 1998). In the final step of thematic analysis, the researcher wrote the final report, which detailed the story of the data, whereby explanative narrative was balanced with transcript extracts as exemplars and an interwoven interpretive argument that was clearly linked to the initial research questions, was proposed (Braun & Clark, 2006).

Quantitative and Qualitative Data Integration

In the final stage of the mixed methods research design, the quantitative and qualitative results were analysed for convergent and divergent findings, in order to generate a rich understanding of the phenomena investigated. Termed data integration, this process refers to “making meaningful conclusions on the basis of consistent and inconsistent results” (Teddlie & Tashakkori, 2009, p. 305). In establishing and strengthening the validity and credibility of the findings, convergence or corroboration of the results via multiple research methods—termed triangulation—was employed, but held in equal regard was the divergence or dissonance of results (Greene, 2007; Johnson & Onwuegbuzie, 2004; Teddlie & Tashakkori, 2010). This focus on recognising, interpreting, and reporting both convergent and divergent results is argued to provide greater perspectives, insights, and understandings into complex aspects of the research problem than is achievable through focusing on convergence alone (Greene, 2007; Teddlie & Tashakkori, 2010). In addition, integrating the data was undertaken within the framework of prior theory and empirical research, in order to evaluate the present findings in the context of an existing body of knowledge.

Credibility in qualitative data analysis, analogous to internal validity in quantitative designs, deals with the question “how congruent are the findings with reality?” (Shenton, 2004). Ensuring credibility is integral to establishing trustworthiness, and it can be supported by: adopting well-established research methods; triangulation of the data by different methods; analysis of negative cases; tactics to ensure honesty in informants (non-compulsory involvement, building of rapport); iterative questioning; peer scrutiny of the research; thick and detailed description of the phenomenon under study; and the examination of previous research findings to test the extent to which the findings were congruent with past

research (Lincoln & Guba, 1985; Miles & Huberman, 1994; Silverman, 2000). In order to establish the credibility of the current research, this methodology chapter has addressed in detail each of these aforementioned aspects.

Also integral to the trustworthiness of qualitative findings, the transferability of qualitative results (akin to external validity in quantitative research), is concerned with demonstrating that the findings can be applied to a wider population (Shenton, 2004). The provision of a full description of the contextual information related to the fieldwork is important, so as to allow future readers to make inferences regarding the transferability of conclusions across other setting and populations (Lincoln & Guba, 1985) state that. In addressing this, the present research furnished a detailed description of the age, gender, cultural background, socio-economic-status, achievement level, and self-concept level of the participants for this component of the investigation. Additionally, the educational settings in which students were situated were described. Finally, in establishing the dependability of the qualitative findings (analogous to reliability in quantitative research), Lincoln and Guba (1985) argue that the research design and its implementation should be reported in such detail as to allow a future researcher to replicate the work.

The present chapter, addressing the reliability of the findings, has provided an in-depth coverage of the planning and execution of the research methods.

Chapter Summary

This chapter has described the methodology utilised to address and answer the hypotheses and research questions posed in Chapter 4. A rationale for the use of a mixed methods research approach and the subsequent framework utilised, was provided. A description of the overall participant sample at each time phase, and of allocation to quantitative and qualitative analysis groups, has been presented and the instrumentation utilised to collect the statistical and textual data has been described. An outline of the data collection procedures, and the analyses utilised to assess the quantitative and qualitative data has been furnished. Specifically, the chapter has explained the reliability analyses, CFAs, and factorial invariance testing utilised to examine the psychometric properties of the quantitative measures in Study 1. Additionally, the processes involved in longitudinal SEM analyses utilised in Study 2 to assess the differences between students on academic and psychosocial outcomes have been outlined. Finally, the methods and tools of thematic analysis used to

address the qualitative research questions of Study 3, were discussed. The findings emanating from these analyses are the focus of the subsequent chapters. Chapter 6 presents the normality, reliability, CFA, and invariance testing results in evaluating the psychometric properties of the instrumentation used. Chapter 7 presents the results of the longitudinal SEM analyses; the qualitative results are provided in Chapter 8.

CHAPTER 6 RESULTS OF STUDY 1: PSYCHOMETRIC PROPERTIES OF THE INSTRUMENTATION AT TIME 1 AND TIME 2

Introduction

A majority of the constructs in psychological and educational research are hypothetical constructs. In order for them to be useful in building and testing theory, they must be validated using a strict construct validity approach that examines the constructs from both a within-network and between-network perspective (Marsh, Martin, & Hau, 2006). Specifically, the within-network study is one that investigates the internal structure or dimensionality of a construct (Marsh, 1990b, 1990c; Marsh, Trautwein, et al., 2006). In contrast, a between-network study aims to establish how the construct may be related to other associated or distinct constructs in a logically, theoretically consistent pattern (Marsh, 2002a). The construct validation approach should focus on within-network studies before moving onto between-network studies (Marsh, 1993). Hence, it was vital to establish the psychometric properties of measures utilised in the present investigation, prior to proceeding to between-construct issues.

The present chapter assesses the psychometric properties of the instrumentation used to measure Mathematics and English academic achievement (as measured by the WRAT4; Wilkinson & Robertson, 2006), Mathematics and English academic self-concept (as measured by the ASDQ-II subscales; Marsh, 1990c), General School and Parent Relations self-concept (as measured by the SDQII-S subscales; Marsh, Ellis, et al., 2005), Mathematics and English academic buoyancy (as measured by the ABS; based on Martin & Marsh, 2006; 2008a), Teacher and Parent pressure to achieve (as measured by the newly adapted IAP; based on Organisation for Economic Cooperation and Development, 2002), and Depression and Anxiety (as measured by the DASS-21 subscales; Lovibond & Lovibond, 1995). The findings presented in this chapter are based on Time 1 ($N = 1,993$ students from four Australian secondary schools, Years 7 to 10) and Time 2 data ($N = 1,753$

students from four Australian secondary schools, Years 7 to 10), and are organised around the hypotheses and research questions outlined in Chapter 4.

Consistent with the construct validity approach previously outlined in the Methodology Chapter, the hypotheses were primarily focused on the normality and reliabilities associated with each construct, the factor structure underpinning the measures, and the invariance of factor structure across gender, year level (junior—Year 7 and 8; middle—Year 9 and 10 students), and school setting/achievement groupings (selective, high achievement comprehensive, and other achievement comprehensive). Specifically, the central focus of this chapter was to systematically test the reliability, validity, and invariance of the measures utilised, in order to provide a sound and robust foundation from which to examine between-construct issues salient to the present investigation.

Psychometric Properties of the Wide Range Achievement Test 4 (WRAT4) Distribution and Reliability of the WRAT4

Results for Hypothesis 1.1.1: Normality and reliability of the WRAT4.

Hypothesis 1.1.1 predicted that distribution and reliability tests would demonstrate normality and internal consistency for the three subscales measured by the WRAT4 (Mathematics, Spelling, and Sentence Comprehension) at Time 1 and Time 2.

Descriptive statistics for each subscale, presented in Table 6.1 indicate that the Mathematics, Spelling, and Sentence Comprehension facets were approximately normally distributed. Internal consistency coefficients, also displayed in Table 6.1, show excellent Cronbach's alpha values ($>.70$; Hills, 2008), ranging from .89 to .93 for Time 1, and .90 to .95 for Time 2.

Conclusions for Hypothesis 1.1.1: Normality and Reliability of the WRAT4. Overall, the findings provided support for the hypothesis that the factors would be normally distributed. The Cronbach's alpha values for the total sample for the three subscales of the WRAT4 all surpassed the minimum criteria for acceptability. As such, Hypothesis 1.1.1 was accepted.

Table 6.1

Descriptive Statistics and Cronbach's Alpha Reliability Values for the WRAT4

	Mean	Standard Deviation	Skewness	Kurtosis	Cronbach's α
Time 1					
Mathematics	29.21	6.78	-.37	-.26	.89
Spelling	28.41	6.54	-.97	1.80	.93
Sentence Comprehension	27.96	7.93	-.76	.54	.93
Time 2					
Mathematics	28.61	6.58	-.55	2.99	.90
Spelling	28.80	5.88	-.87	.55	.92
Sentence Comprehension	31.08	8.13	-1.27	2.59	.95

Factor Structure of the WRAT4

Results for Hypothesis 1.2.1: Factor Structure of the WRAT4. It was posited that the data would support a sound three-factor structure for the WRAT4 at Time 1 and Time 2. Results of the CFAs are shown in Table 6.2, with the three-factor model demonstrating an excellent fit to the data at both time points (Time 1: $\chi^2 = 681.19$, $df = 249$, RMSEA = .03, CFI = .99, TLI = .99; Time 2: $\chi^2 = 478.54$, $df = 249$, RMSEA = .02, CFI = .99, TLI = .99). Inspection of the factor loadings showed that the constructs were well defined and that each loading was statistically significant and substantial in size (Time 1: range .64 to .85; Time 2: range .66 to .87), exceeding the minimum .30 requirement (Hills, 2008). As such, all items loaded appropriately on their designated factor. Additionally, the correlations between the three first-order factors at Time 1 and Time 2 support the presence of three distinct domains of achievement.

Conclusions for Hypothesis 1.2.1: Factor Structure of the WRAT4. In conclusion, the findings assessing the three-factor model of the WRAT4 at both time points demonstrate support for the factor structure of the measure. Furthermore, the goodness-of-fit indices, factor loadings, and factor correlations support the use of these factors in the present investigation. As such Hypothesis 1.2.1 regarding the factorial structure of the WRAT4 was accepted.

Table 6.2

Factor Loadings for the WRAT4

	Mathematics		Spelling		Sentence Comprehension	
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
Item 1	.66	.72	.80	.80	.80	.85
Item 2	.64	.72	.80	.81	.77	.86
Item 3	.78	.75	.82	.78	.85	.85
Item 4	.76	.71	.83	.82	.78	.85
Item 5	.75	.74	.79	.83	.82	.87
Item 6	.70	.79	.81	.76	.84	.85
Item 7	.77	.75	.79	.75	.79	.80
Item 8	.79	.71				
Item 9	.81	.66				
Item 10	.77	.73				
Time 1 and Time 2 Factor Correlations						
	Mathematics			Spelling		
Spelling	.67/.70					
Sentence Comprehension	.58/.55			.74/.75		

Note. Time 1 factor correlations are presented before the forward slash, Time 2 factor correlations after the slash.

Factorial Invariance of the WRAT4 for Gender

Results for Hypothesis 1.3.1: Factorial invariance of the WRAT4 across gender. Hypothesis 1.3.1 predicted that the factor structure of the WRAT4 would be similar for both males and females at Time 1 and Time 2 testing points. The results of the multi-group CFAs conducted to assess this prediction are presented in Table 6.3. The first multi-group CFA at each time point allowed all factor loadings, uniquenesses, and correlations/variances to be freely estimated. This is known as the baseline model or Model 1. The baseline models showed excellent fits with the data at each time wave (Time 1: $\chi^2 = 1043.11$, $df = 519$, CFI = .98, TLI = .98, RMSEA = .03; Time 2: $\chi^2 = 823.61$, $df = 519$, CFI = .99, TLI = .99, RMSEA = .03), demonstrating that the factor structure of the WRAT4 was consistent across males and females. In order to test for invariance, it was necessary to examine the comparative fit indices for four additional models, across males and females. As outlined in Chapter 5, the second model holds the factor loadings invariant across males and females; the third holds both factor loadings and correlations/variances invariant; the fourth holds factor loadings and correlated uniquenesses invariant; and the fifth model holds factor loadings, correlations/variances, and correlated uniquenesses invariant.

Table 6.3

Gender Invariance for the WRAT4 at Time 1 and Time 2

	χ^2	<i>df</i>	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	1043.11	519	.98	.98	.03
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	1082.77	540	.98	.98	.03
Model 3: FL + COVARIANCE (CV) invariant	1117.31	546	.98	.98	.03
Model 4: FL + UNIQUENESSES (UN) invariant	1122.08	564	.98	.98	.03
Model 5: FL + CV + UN invariant	1157.49	570	.98	.98	.03
Time 2					
Model 1: No invariance	823.61	519	.99	.99	.03
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	861.54	540	.99	.99	.03
Model 3: FL + COVARIANCE (CV) invariant	918.19	546	.99	.99	.03
Model 4: FL + UNIQUENESSES (UN) invariant	898.66	564	.99	.99	.03
Model 5: FL + CV + UN invariant	958.27	570	.99	.99	.03

Results for Time 1 and Time 2 demonstrated that when successive aspects of the factor structure were held invariant across gender groups, the fit indices remained comparable across the five models. Specifically, the CFI statistic produced no notable change greater than .01 (Cheung & Rensvold, 2002), even when Model 5 saw the assumption of complete invariance of the factor structure across factor loadings, variances/covariances, and correlated uniquenesses. Therefore, the WRAT4 met the requirements for a fully invariant model across gender at both time points.

Conclusions for Hypothesis 1.3.1: Factorial invariance of the WRAT4 across gender. The results support the invariance of the three-factor model of the WRAT4 across gender at Time 1 and Time 2 in relation to the most restrictive test of invariance. Consequently, the findings indicate that it was justifiable to pool data for males and females in subsequent analyses. Thus, Hypothesis 1.3.1, regarding factor invariance of the WRAT4 for gender, was supported.

Factorial Invariance of the WRAT4 for Year Level

Results for Hypothesis 1.3.2 Factorial invariance of the WRAT4 across year level. Hypothesis 1.3.2 predicted that the student responses to the WRAT4 would produce a consistent factor structure across junior and middle year level groups and across both time waves. The results of the subsequent multi-group CFAs

testing this hypothesis are presented in Table 6.4. Model 1 for each time wave, in which all parameters were freely estimated, yielded an excellent fit to the data (Time 1: $\chi^2 = 1309.59$, $df = 519$, CFI = .98, TLI = .97, RMSEA = .04; Time 2: $\chi^2 = 868.24$, $df = 519$, CFI = .99, TLI = .99, RMSEA = .03), supporting the consistency of the factor structure across the year levels. Even though these models fitted the data well, it was again necessary to test for invariance across the two year level groupings in a formal process. Utilising Cheung and Rensvold's (2002) criteria, the results showed that the goodness-of-fit statistics did not change significantly across the models tested. The WRAT4 demonstrated a completely invariant model for junior and middle year level groups across factor loadings, variances/covariances, and correlated uniquenesses. This finding suggests that the central constructs of the WRAT4 were similar for junior and middle high school students.

Table 6.4

Year Level Invariance for the WRAT4 at Time 1 and Time 2

	χ^2	df	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	1309.59	519	.98	.97	.04
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	1477.14	540	.97	.97	.04
Model 3: FL + COVARIANCE (CV) invariant	1525.24	546	.97	.97	.04
Model 4: FL + UNIQUENESSES (UN) invariant	1584.14	564	.97	.97	.04
Model 5: FL + CV + UN invariant	1627.32	570	.97	.97	.04
Time 2					
Model 1: No invariance	868.24	519	.99	.99	.03
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	926.07	540	.99	.99	.03
Model 3: FL + COVARIANCE (CV) invariant	968.63	546	.99	.99	.03
Model 4: FL + UNIQUENESSES (UN) invariant	1011.72	564	.98	.99	.03
Model 5: FL + CV + UN invariant	1053.25	570	.98	.98	.03

Conclusions for Hypothesis 1.3.2 Factorial invariance of the WRAT4

across year level. In support of Hypothesis 1.3.2, the WRAT4 measure was found to exhibit complete invariance at Time 1 and Time 2 for year level groupings across the most restrictive model, where factor loadings, variances/covariances, and correlated

uniquenesses were held invariant. As a result, Hypothesis 1.3.2 regarding the factor invariance of the WRAT4 at both time waves across Year level was accepted.

Factorial Invariance of the WRAT4 for Setting/Achievement Groups

Results for Hypothesis 1.3.3 Factorial invariance of the WRAT4 across setting/achievement groups. Hypothesis 1.3.3 predicted that the factor structure of the WRAT4 would be consistent for academically selective, high achievement comprehensive, and other achievement comprehensive groupings at Time 1 and Time 2. To evaluate this prediction, an increasing number of parameters were restricted over a total of five models, using multi-group CFAs. As shown in Table 6.5, the completely free baseline models yielded excellent fits to the data (Time 1: $\chi^2 = 1646.80$, $df = 789$, CFI = .98, TLI = .97, RMSEA = .03; Time 2: $\chi^2 = 1359.35$, $df = 789$, CFI = .99, TLI = .99, RMSEA = .02), supporting the hypothesis of a similar factor structure across the groups. In Model 2, imposing equality constraints on the factor loadings showed negligible changes in the fit indices, not exceeding .01, thereby satisfying the minimal requirement for factorial invariance across school setting/achievement groups (Byrne, 1998; Cheung & Rensvold, 2002). The imposition of subsequent constraints on the variances/covariances in Model 3, and the uniquenesses in Model 4 and Model 5, produced a change in the CFI statistic exceeding .01 from the baseline model. Therefore, these aspects of the model cannot be considered invariant.

Conclusions for Hypothesis 1.3.3 Factorial invariance of the WRAT4 across setting/achievement groups. In support of Hypothesis 1.3.3, the WRAT4 was found to meet the minimal requirements for invariance across the three setting/achievement groupings in relation to factor structure and factor loadings (Byrne, 1998; Cheung & Rensvold, 2002) across Time 1 and Time 2. However, more restrictive tests of the factor structure in relation to variances/covariances and uniquenesses did not produce invariance. Nonetheless, as the minimum invariance requirement was met, Hypothesis 1.3.3 was accepted.

Table 6.5

Setting/Achievement Grouping Invariance for the WRAT4 at Time 1 and Time 2

	χ^2	<i>df</i>	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	1646.80	789	.98	.97	.03
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	2438.26	837	.97	.96	.04
Model 3: FL + COVARIANCE (CV) invariant	2734.46	843	.93	.93	.05
Model 4: FL + UNIQUENESSES (UN) invariant	3969.67	885	.91	.92	.06
Model 5: FL + CV + UN invariant	4299.94	891	.90	.90	.07
Time 2					
Model 1: No invariance	1359.35	789	.99	.99	.02
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	1813.38	837	.98	.98	.03
Model 3: FL + COVARIANCE (CV) invariant	1841.89	843	.96	.96	.04
Model 4: FL + UNIQUENESSES (UN) invariant	2798.48	885	.93	.93	.05
Model 5: FL + CV + UN invariant	2830.39	891	.92	.92	.06

Psychometric Properties of the Academic Self-Description Questionnaire II (ASDQ-II) Subscales

Distribution and Reliability of the ASDQ-II Subscales

Results for Hypothesis 1.1.2: Normality and reliability of the ASDQ-II subscales. Hypothesis 1.1.2 predicted that tests of distribution and reliability would demonstrate normality and acceptable Cronbach's alpha values for the two subscales utilised from the ASDQ-II (Mathematics and English). As presented in Table 6.6, the distributional data indicated the two academic self-concept constructs were approximately normally distributed. Furthermore, the reliability estimates for the total sample were acceptable, well above the .70 criterion for research purposes (Hills, 2008) at both time points.

Conclusions for Hypothesis 1.1.2: Reliability of the ASDQ-II subscales.

Consistently with predictions made, it was concluded that the Mathematics and English subscales of the ASDQ-II were normally distributed and reliable measures of their constructs. Therefore, Hypothesis 1.1.2 was accepted.

Table 6.6

Descriptive Statistics and Cronbach's Alpha Reliability Values for the ASDQ-II Subscales

	Mean	Standard Deviation	Skewness	Kurtosis	Cronbach's α
Time 1					
Mathematics Self-Concept	4.44	.98	.98	.41	.91
English Self-Concept	4.22	1.02	1.02	.19	.91
Time 2					
Mathematics Self-Concept	4.76	1.05	-.65	.54	.89
English Self-Concept	4.62	.88	-.54	.39	.85

Factor Structure of the ASDQ-II Subscales

Results for Hypothesis 1.2.2: Factor structure of the ASDQ-II subscales.

It was hypothesised that Confirmatory Factor Analysis (CFA) would support a sound a priori two-factor structure of the ASDQ-II subscales at Time 1 and Time 2, as demonstrated by satisfactory goodness-of-fit indices. Results of the CFAs testing the two-factor structure are presented in Table 6.7. At both time points, the model provided a good to excellent fit with the data (Time 1: $\chi^2 = 382.80$, $df = 47$, RMSEA = .06, CFI = .98, TLI = .97; Time 2: $\chi^2 = 331.40$, $df = 47$, RMSEA = .06, CFI = .98, TLI = .97). The factor loadings indicate that the factors were well defined and that the loadings were robust and statistically significant (Time 1 range = .66 to .86; Time 2 range = .67 to .86). All items loaded highly on the factors they were intended to measure, well above the .30 requirement (Hills, 2008). Additionally, the correlation between the two first-order factors was low at .15 and .11 at Time 1 and Time 2 respectively, thereby supporting the distinctiveness of the two factors.

Conclusions for Hypothesis 1.2.2: Factor structure of the ASDQ-II subscales. In summary, the results assessing the two-factor model of the ASDQ-II subscales at Time 1 and Time 2 indicated support for the factor structure of the central constructs of Mathematics and English. Specifically, the goodness-of-fit indices, factor loadings, and the factor correlations, supported the use of these factors in the current study. As such Hypothesis 1.2.2 regarding the factorial structure of the ASDQ-II subscales was accepted.

Table 6.7

Factor Loadings for the ASDQ-II Subscales

Time 1						
	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6
Mathematics	.85	.79	.73	.70	.84	.78
Self-Concept						
English	.83	.83	.78	.66	.86	.79
Self-Concept						
Time 2						
	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6
Mathematics	.85	.80	.77	.68	.86	.77
Self-Concept						
English	.80	.84	.76	.67	.86	.79
Self-Concept						

Factorial Invariance of the ASDQ-II Subscales for Gender**Results for Hypothesis 1.3.4: Factorial invariance of the ASDQ-II**

subscales across gender. It was predicted that the factor structure of the ASDQ-II subscales of Mathematics and English academic self-concept would be invariant across males and females at Time 1 and Time 2. Analyses involved multi-group CFAs of the ASDQ-II subscales as a function of gender across both time points. As shown in Table 6.8, the baseline models that allowed all factor loadings, uniquenesses, and correlations/variances to be freely estimated, yielded good to excellent fits with the data at each time wave (Time 1: $\chi^2 = 546.67$, $df = 104$, CFI = .97, TLI = .96, RMSEA = .07; Time 2: $\chi^2 = 451.63$, $df = 104$, CFI = .97, TLI = .97, RMSEA = .06). This supports the consistency of the factor structure across gender. When successive elements of the factor structure were subsequently held invariant across gender groups, the results for Time 1 and Time 2 showed that the fit indices were primarily comparable. Specifically, application of the recommended criterion for evidence of invariance (i.e., a change in fit indices of no greater than .01—see Cheung & Rensvold, 2002) demonstrated a completely invariant model.

Conclusions for Hypothesis 1.3.4: Factor invariance of the ASDQ-II

subscales across gender. Consistent with Hypothesis 1.3.4, support was found for the invariance of the Mathematics and English academic self-concept subscales of the ASDQ-II measure across gender. Full invariance was found in relation to the factor structure, factor loadings, correlations/variances, and uniquenesses for Time 1 and Time 2. Therefore, Hypothesis 1.3.4 was supported.

Table 6.8

Gender Invariance for the ASDQ-II Subscales at Time 1 and Time 2

	χ^2	<i>df</i>	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	546.67	104	.97	.96	.07
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	576.17	114	.97	.96	.06
Model 3: FL + COVARIANCE (CV) invariant	581.85	117	.97	.97	.06
Model 4: FL + UNIQUENESSES (UN) invariant	668.79	132	.96	.96	.06
Model 5: FL + CV + UN invariant	675.15	135	.96	.97	.06
Time 2					
Model 1: No invariance	451.63	104	.97	.97	.06
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	479.00	114	.97	.97	.06
Model 3: FL + COVARIANCE (CV) invariant	480.89	117	.97	.97	.06
Model 4: FL + UNIQUENESSES (UN) invariant	591.13	132	.96	.96	.06
Model 5: FL + CV + UN invariant	593.80	135	.96	.97	.06

Factorial Invariance of the ASDQ-II Subscales for Year Level**Results for Hypothesis 1.3.5: Factorial invariance of the ASDQ-II**

subscales across year level. Hypothesis 1.3.5 predicted that the factor structure of the ASDQII subscales would be a consistent measure for both junior and middle school students across both time waves. To evaluate this prediction, CFA tests of invariance were conducted with an identical factor structure and with items tested within each year level group. As shown in Table 6.9, the completely free Model 1 for each time wave yielded a good to excellent fit to the data (Time 1: $\chi^2 = 547.37$, $df = 104$, CFI = .97, TLI = .96, RMSEA = .07; Time 2: $\chi^2 = 449.97$, $df = 104$, CFI = .97, TLI = .97, RMSEA = .06), indicating an equivalent factor structure for both year groups. In examining the criteria for invariance of a change no greater than .01 in the CFI (Cheung & Rensvold, 2002), it can be seen the CFI statistic remained constant throughout the subsequent imposition of increasingly restrictive constraints on the factor structure of the ASDQ-II subscales.

Conclusions for Hypothesis 1.3.5: Factor invariance of the ASDQ-II

subscales across year level. The results suggest not only that the ASDQ-II subscales met the minimal requirement of invariance for the factor loadings (Byrne, 1998; Cheung & Rensvold, 2002), but also that even the most restrictive models showed

the ASDQ-II subscales to be completely invariant across the junior and middle high school groups. Thus, Hypothesis 1.3.5 was accepted.

Table 6.9

Year Level Invariance for the ASDQ-II Subscales at Time 1 and Time 2

	χ^2	<i>df</i>	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	547.37	104	.97	.96	.07
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	591.55	114	.97	.96	.07
Model 3: FL + COVARIANCE (CV) invariant	625.39	117	.97	.96	.07
Model 4: FL + UNIQUENESSES (UN) invariant	653.78	132	.97	.97	.06
Model 5: FL + CV + UN invariant	689.66	135	.96	.96	.06
Time 2					
Model 1: No invariance	449.97	104	.97	.97	.06
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	482.15	114	.97	.97	.06
Model 3: FL + COVARIANCE (CV) invariant	625.39	117	.97	.97	.06
Model 4: FL + UNIQUENESSES (UN) invariant	653.78	132	.97	.97	.06
Model 5: FL + CV + UN invariant	538.86	135	.97	.97	.06

Factorial Invariance of the ASDQ-II Subscales for Setting/Achievement Groups

Results for Hypothesis 1.3.6: Factorial invariance of the ASDQ-II

subscales across setting/achievement groups. Hypothesis 1.3.6 predicted that the student responses to the ASDQII subscales would demonstrate a consistent factor structure for the three setting/achievement groups across Time 1 and Time 2 testing points. As such, multi-group CFAs examined the two-factor structure of the ASDQ-II subscales for selective, high achievement comprehensive, and other achievement comprehensive students. As shown in Table 6.10, the baseline models yielded good to excellent fits to the data (Time 1: $\chi^2 = 722.05$, *df* = 161, CFI = .97, TLI = .96, RMSEA = .07; Time 2: $\chi^2 = 677.56$, *df* = 161, CFI = .96, TLI = .95, RMSEA = .07). Subsequent inspection of the fit indices generated by the four successive and increasingly restrictive models, according to Cheung and Rensvold's (2002) criteria, indicated differing results for each time point. For Time 1, the CFI statistic was largely comparable with the baseline model when constraints were placed on the factor loadings (Model 2) and the variances/covariances (Model 3). However, when

increasingly restrictive constraints were placed on the correlated uniquenesses in Model 4 and Model 5, this resulted in substantial change to the CFI statistic greater than .01 (Cheung & Rensvold, 2002) compared to the baseline model. However, the minimal requirement for factorial invariance across factor loadings was met for Time 1. For Time 2, placing further parameter restrictions in the successive four models produced minimal changes in the CFI, demonstrating a completely invariant model for Time 2.

Table 6.10

Setting/Achievement Grouping Invariance for the ASDQ-II Subscales at Time 1 and Time 2

	χ^2	<i>df</i>	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	722.05	161	.97	.96	.07
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	851.41	185	.96	.96	.07
Model 3: FL + COVARIANCE (CV) invariant	855.99	187	.96	.96	.07
Model 4: FL + UNIQUENESSES (UN) invariant	1219.75	221	.95	.95	.08
Model 5: FL + CV + UN invariant	1224.50	223	.95	.95	.08
Time 2					
Model 1: No invariance	677.56	161	.96	.95	.07
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	804.12	185	.96	.95	.07
Model 3: FL + COVARIANCE (CV) invariant	807.73	187	.96	.96	.07
Model 4: FL + UNIQUENESSES (UN) invariant	1065.78	221	.95	.95	.07
Model 5: FL + CV + UN invariant	1069.53	223	.95	.95	.07

Conclusions for Hypothesis 1.3.6: Factor invariance of the ASDQ-II subscales across setting/achievement groups. As predicted by Hypothesis 1.3.6, support was found for the invariance of the Mathematics and English subscales of the ASDQ-II across student setting/achievement groupings for both time points. At Time 1, invariance was found in relation to factor loadings and variances/covariances, whilst at Time 2 the model was found to be fully invariant. Hence, Hypothesis 1.3.6 was accepted.

Psychometric Properties of the Self-Description Questionnaire II Short (SDQII-S) Subscales

Distribution and Reliability of the SDQII-S Subscales

Results for Hypothesis 1.1.3: Normality and Reliability of the SDQII-S subscales. It was predicted that the General School and Parent Relations self-concept subscales of the SDQII-S utilised in the present study would be normally distributed and exhibit sound internal consistency reliability at both time points. As can be seen from Table 6.11, the descriptive statistics indicate that the constructs were normally distributed. The Cronbach's alpha estimates for the General School and Parent Relations constructs demonstrate values well above the required .70 for research (Hills, 2008).

Table 6.11

Descriptive Statistics and Cronbach's Alpha Reliability Values for the SDQII-S Subscales

	Mean	Standard Deviation	Skewness	Kurtosis	Cronbach's α
Time 1					
General School	4.65	1.06	-.77	1.05	.86
Parent Relations	4.88	1.01	-1.01	.93	.93
Time 2					
General School	4.22	.98	-.76	.89	.91
Parent Relations	4.37	.96	-1.02	1.00	.91

Conclusions for Hypothesis 1.1.3: Normality and Reliability of the SDQII-S subscales. The results demonstrated that the General School and Parent Relations subscales of the SDQII-S displayed approximately normal distributional properties and sound internal consistency reliability. Hence, Hypothesis 1.1.3 was supported.

Factor Structure of the SDQII-S Subscales

Results for Hypothesis 1.2.3: Factor structure of the SDQII-S subscales.

It was hypothesised that data would support a sound two-factor structure underpinning the SDQII-S subscales at Time 1 and Time 2. Results of the CFAs are presented in Table 6.12, with the two-factor model providing an excellent fit to the data at both time points (Time 1: $\chi^2 = 66.46$, $df = 19$, RMSEA = .04, CFI = .99, TLI = .99; Time 2: $\chi^2 = 88.08$, $df = 19$, RMSEA = .05, CFI = .99, TLI = .99). Inspection

of the factor loadings indicates that the General School and Parent Relations factors were well defined, and that each item loading was statistically significant and substantial in size (Time 1: range .66 to .87; Time 2: range .65 to .88). In essence, all items loaded highly on their designated factor above the required .30 value (Hills, 2008). In addition, the correlation between the two first-order factors was low at Time 1 and Time 2 (.26 and .31 respectively), supporting the presence of two discrete factors.

Table 6.12

Factor Loadings for the SDQII-S Subscales

Time 1				
	Item 1	Item 2	Item 3	Item 4
Parent Relations	.84	.84	.84	.69
General School	.69	.66	.85	.87
Time 2				
	Item 1	Item 2	Item 3	Item 4
Parent Relations	.86	.86	.81	.74
General School	.67	.65	.88	.87

Conclusions for Hypothesis 1.2.3: Factor structure of the SDQII-S subscales. Results of the CFA demonstrated support for the two-factor model of the SDQII-S subscales at Time 1 and Time 2. In particular, the fit statistics, factor loadings, and factor correlations indicated the validity of using the central constructs in the present study. Consequently, Hypothesis 1.2.3 regarding the factor structure of the SDQII-S subscales was supported.

Factorial Invariance of the SDQII-S Subscales for Gender

Results for Hypothesis 1.3.7: Factorial invariance of the SDQII-S subscales across gender. It was predicted that the factor structure of the SDQII-S subscales would be invariant across males and females at Time 1 and Time 2. The first set of invariance analyses comprised multi-group CFAs of the SDQII-S subscales as a function of gender. As shown in Table 6.13, the initial multi-group models yielded excellent fits to the data for both time points (Time 1: $\chi^2 = 117.03$, $df = 44$, RMSEA = .04, CFI = .99, TLI = .99; Time 2: $\chi^2 = 147.56$, $df = 44$, RMSEA = .05, CFI = .99, TLI = .98), providing support for an equivalent factor structure for both males and females. The formal test for invariance for Time 1 indicated that, using Cheung and Rensvold's (2002) recommended criteria, in each additional model

where specific parameters were constrained to be invariant, the CFI statistic was largely comparable. As such, the SDQII-S subscales were completely invariant for Time 1 across gender. For Time 2, the constraint of factor loadings (Model 2) and variances/covariances (Model 3) resulted in minimal changes in the CFI as compared to the baseline model, thus meeting the minimal requirements for factorial invariance (Byrne, 1998; Cheung & Rensvold, 2002). The imposition of additional constraints on the error terms in Model 4 and Model 5 resulted in a change in the CFI of greater than .01 as compared to the baseline model (Cheung & Rensvold, 2002). As a result, the SDQII-S subscales were considered invariant in regard to factor loadings and variances/covariances for Time 2.

Table 6.13

Gender Invariance for the SDQII-S Subscales at Time 1 and Time 2

	χ^2	<i>df</i>	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	117.03	44	.99	.99	.04
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	122.81	50	.99	.99	.04
Model 3: FL + COVARIANCE (CV) invariant	123.35	53	.99	.99	.04
Model 4: FL + UNIQUENESSES (UN) invariant	172.06	58	.99	.99	.04
Model 5: FL + CV + UN invariant	172.85	61	.99	.99	.04
Time 2					
Model 1: No invariance	147.56	44	.99	.98	.05
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	153.52	50	.99	.99	.05
Model 3: FL + COVARIANCE (CV) invariant	159.38	53	.99	.99	.05
Model 4: FL + UNIQUENESSES (UN) invariant	269.27	58	.97	.97	.06
Model 5: FL + CV + UN invariant	274.22	61	.97	.97	.06

Conclusions for Hypothesis 1.3.7: Factor invariance of the SDQII-S subscales across gender. As predicted, the General School and Parent Relations subscales of the SDQII-S were invariant across males and females for both time waves. For Time 1, the model was considered fully invariant across all parameters. For Time 2, the model demonstrated invariance for factor loadings and variances/covariances. Thus, Hypothesis 1.3.7 was accepted.

Factorial Invariance of the SDQII-S Subscales for Year Level

Results for Hypothesis 1.3.8: Factorial invariance of the SDQII-S subscales across year level. Hypothesis 1.3.8 predicted that the factor structure of the SDQII-S subscales would be similar for junior and middle school year participants for Time 1 and Time 2, as demonstrated by multi-group CFA tests of invariance. As displayed in Table 6.14, the initial multi-group models where all parameters were set to be completely free between the student year groups produced excellent fits to the data at both time points (Time 1: $\chi^2 = 116.82$, $df = 44$, RMSEA = .04, CFI = .99, TLI = .99; Time 2: $\chi^2 = 157.08$, $df = 44$, RMSEA = .05, CFI = .99, TLI = .98). The goodness-of-fit statistics generated for each successive and increasingly restrictive model were essentially comparable, with the CFI only minimally affected by the imposed constraints. Indeed, these formal tests of invariance at Time 1 and Time 2 indicate there was full invariance of the SDQII-S subscales across all models for junior and middle year groups.

Table 6.14

Year Level Invariance for the SDQII-S Subscales at Time 1 and Time 2

	χ^2	df	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	116.82	44	.99	.99	.04
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	150.30	50	.99	.99	.05
Model 3: FL + COVARIANCE (CV) invariant	183.72	53	.98	.98	.05
Model 4: FL + UNIQUENESSES (UN) invariant	192.04	58	.98	.98	.05
Model 5: FL + CV + UN invariant	228.32	61	.98	.98	.05
Time 2					
Model 1: No invariance	157.08	44	.99	.98	.05
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	179.02	50	.98	.98	.05
Model 3: FL + COVARIANCE (CV) invariant	183.57	53	.98	.98	.05
Model 4: FL + UNIQUENESSES (UN) invariant	190.92	58	.98	.98	.05
Model 5: FL + CV + UN invariant	195.01	61	.98	.98	.05

Conclusions for Hypothesis 1.3.8: Factorial invariance of the SDQII-S subscales across year level. In conclusion, the General School and Parent Relations subscales of the SDQII-S met not only the minimal requirement of multi-group

invariance across the two year level groups (Byrne, 1998; Cheung & Rensvold, 2002), but also produced strong measurement equivalence for the completely invariant model. As such, Hypothesis 1.3.8 was accepted.

Factorial Invariance of the SDQII-S Subscales for Setting/Achievement Groups

Results for Hypothesis 1.3.9: Factor invariance of the SDQII-S subscales across setting/achievement groups. Hypothesis 1.3.9 predicted that the SDQII-S subscales would be a consistent measure for high achieving students in academically selective schools and high and other achieving students in comprehensive school settings. As reported in Table 6.15, the model where all parameters were set to be completely free between the three groups yielded excellent fits to the data at both time waves (Time 1: $\chi^2 = 204.15$, $df = 69$, RMSEA = .05, CFI = .99, TLI = .98; Time 2: $\chi^2 = 188.89$, $df = 69$, RMSEA = .05, CFI = .99, TLI = .98). Results for Time 1 in Table 6.15 indicated that in each additional model where specific parameters were systematically held invariant, the fit indices were comparable, against Cheung and Rensvold's (2002) recommended criteria. For Time 2, the constraint of factor loadings (Model 2) and variances/covariances (Model 3) produced negligible changes in the CFI statistic as compared to the baseline model. The addition of constraining the error terms to be equal in Model 4 and Model 5, however, resulted in a change in the CFI exceeding the .01 criteria (Cheung & Rensvold, 2002). However, the minimal requirement for invariance of factor loadings (Byrne, 1998; Cheung & Rensvold, 2002) was met for the SDQII-S subscales for Time 2.

Conclusions for Hypothesis 1.3.9: Factor invariance of the SDQII-S subscales across setting/achievement groups. In sum, the two-factor structure of the SDQII-S subscales was invariant for selective, high achieving comprehensive, and other achieving comprehensive student groups. For Time 1, the model was considered fully invariant across the most restrictive parameters. With regard to Time 2, the SDQII-S subscales were invariant in relation to factor loadings and variances/covariances thus meeting the minimal requirement for invariance (Byrne, 1998; Cheung & Rensvold, 2002). Therefore, Hypothesis 1.3.9 was accepted.

Table 6.15

Achievement Grouping Invariance for the SDQII-S Subscales at Time 1 and Time 2

	χ^2	<i>df</i>	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	204.15	69	.99	.98	.05
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	288.40	85	.98	.98	.05
Model 3: FL + COVARIANCE (CV) invariant	289.98	87	.98	.98	.05
Model 4: FL + UNIQUENESSES (UN) invariant	496.10	101	.98	.98	.06
Model 5: FL + CV + UN invariant	498.62	103	.98	.98	.06
Time 2					
Model 1: No invariance	188.89	69	.99	.98	.05
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	260.95	85	.98	.98	.06
Model 3: FL + COVARIANCE (CV) invariant	262.17	87	.98	.98	.06
Model 4: FL + UNIQUENESSES (UN) invariant	388.90	101	.97	.97	.07
Model 5: FL + CV + UN invariant	391.11	103	.97	.97	.06

Psychometric Properties of the Academic Buoyancy Scale (ABS)

Distribution and Reliability of the ABS

Results for Hypothesis 1.1.4: Normality and reliability of the ABS.

Hypothesis 1.1.4 predicted that tests of normality and internal consistency would support the normal distribution and reliability of the Mathematics and English academic buoyancy subscales across both time points. As shown in Table 6.16, the ABS, prior to and post-modification (as discussed in the next section), displayed approximately normal distributional properties, as evidenced by the descriptive statistics. In addition, the Cronbach's alpha estimates for both constructs were well above the required .70 value for research purposes (Hills, 2008) at Time 1 and Time 2, thus demonstrating the reliability of the subscales.

Conclusions for Hypothesis 1.1.4: Normality and reliability of the ABS.

In sum, the results demonstrate that the Mathematics and English subscales of the ABS exhibited normality and internal consistency reliability at Time 1 and Time 2. Thus, Hypothesis 1.1.4 was supported.

Table 6.16

Descriptive Statistics and Cronbach's Alpha Reliability Values for the ABS

	Mean	Standard Deviation	Skewness	Kurtosis	Cronbach's α
Time 1					
Mathematics Buoyancy	4.27 (4.27)	.93 (.94)	-.52 (-.53)	.20 (.22)	.84 (.80)
English Buoyancy	4.26 (4.26)	1.03 (1.04)	-.49 (-.51)	.12 (.13)	.89 (.87)
Time 2					
Mathematics Buoyancy	4.23 (4.22)	.91 (.93)	-.48 (-.51)	.43 (.46)	.85 (.82)
English Buoyancy	4.22 (4.22)	1.02 (1.04)	-.57 (-.58)	.37 (.39)	.91 (.89)

Note. Values for the ABS prior to modification are presented without parentheses, and in parentheses for the modified version.

Factor Structure of the ABS

Results for Hypothesis 1.2.4: Factor structure of the ABS. It was predicted that data would support a sound two-factor structure of the newly developed ABS at Time 1 and Time 2. CFAs were conducted on the data where all 12 items were free to load on their respective factors and all other factor loadings were constrained to be zero. Results of the CFAs, presented in Table 6.17, indicate that the two-factor model provided an unacceptable fit with the data for Time 1 ($\chi^2 = 853.08$, $df = 47$, RMSEA = .09, CFI = .94, TLI = .91), and Time 2 ($\chi^2 = 1148.63$, $df = 47$, RMSEA = .116, CFI = .91, TLI = .87). In both instances, the RMSEA index exceeded the .08 value required for an acceptable model fit (see MacCallum, Browne & Sugawara, 1996; Marsh et al., 1996; Schumacker & Lomax, 1996). Moreover, the TLI value obtained for the Time 2 analysis was less than the .90 level typically taken to reflect an acceptable model fit (McDonald & Marsh, 1990). The factor loadings for the two factors of the ABS were however, well defined, statistically significant, and substantial in strength (Time 1: range .54 to .86; Time 2: range .56 to .85).

As the ABS was newly adapted for the present study, from the original single factor domain-general model to contain two domain-specific factors, it was yet to be validated. Moreover, as it was deemed of utmost importance to have psychometrically robust measures, modification of the scale was undertaken in order to obtain acceptable goodness-of-fit indices and thus, to improve the fit between the data and the model. Accordingly, subsequent post hoc adjustments were carried out,

based upon CFA output. The r^2 values, which indicate the reliability of a given item, were all above the recommended value of .30 (Holmes-Smith, 2008), and all factor loadings were above .50 and statistically significant. Another aid in assessing model fit involves the inspection of modification indices (MI; see Holmes-Smith, 2008; Jöreskog & Sörbom, 1984; 1988). Essentially, MIs represent the expected decrease in the value of the chi-square statistic when a fixed parameter in the existing model is freed to be estimated or, in this instance, removed in the new model (Olsson, Troye, & Howell, 1999). Subsequent inspection of the MIs calculated for the ABS indicated the highest values for item four on each of the subscales of the measure. These two items were subsequently removed from the existing model, and the model was re-estimated.

Table 6.17

Factor Loadings for the ABS

Time 1						
	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6
Mathematics	.54	.66	.66	.72	.71	.79
Buoyancy						
English	.64	.74	.86	.77	.81	.78
Buoyancy						
Time 2						
	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6
Mathematics	.56	.69	.71	.73	.73	.78
Buoyancy						
English	.69	.77	.85	.76	.82	.81
Buoyancy						

Results of the CFA analyses conducted on the modified ABS at Time 1 and Time 2 are presented in Table 6.18, and demonstrate that the 10-item, two-factor model provided a good fit with the data at both time points (Time 1: $\chi^2 = 347.04$, $df = 29$, RMSEA = .07, CFI = .97, TLI = .98; Time 2: $\chi^2 = 313.86$, $df = 29$, RMSEA = .07, CFI = .97, TLI = .95). Inspection of the factor loadings indicated that the factors were well defined and that each factor loading was statistically significant and substantial in size (Time 1 range: .48 to .87; Time 2 range: .48 to .86). In essence, all items loaded highly on their designated factor. Moreover, the correlations amongst the two factors of the modified ABS at Time 1 and Time 2 were .68 and .66 respectively, thus indicating the presence of two distinct factors.

Table 6.18

Factor Loadings and Factor Correlations for the Modified ABS

	Time 1				
	Item 1	Item 2	Item 3	Item 4	Item 5
Mathematics	.48	.61	.65	.75	.83
Buoyancy					
English	.60	.70	.87	.84	.80
Buoyancy					
	Time 2				
	Item 1	Item 2	Item 3	Item 4	Item 5
Mathematics	.48	.61	.69	.77	.84
Buoyancy					
English	.62	.71	.86	.85	.84
Buoyancy					

Conclusions for Hypothesis 1.2.4: Factor structure of the ABS. Following the unacceptable fit indices demonstrated for the newly adapted ABS at Time 1 and Time 2, modification of the scale was deemed justified and thus was undertaken. Results of the CFA analyses conducted on the modified measure demonstrated support for the two-factor model of the ABS at Time 1 and Time 2. The goodness-of-fit indices, factor loadings, and factor correlations indicated the validity of using the central constructs in the present study in the ten-item format. As such, Hypothesis 1.2.4, regarding the factor structure of the ABS, was deemed to be supported.

Factorial Invariance of the ABS for Gender

Results for Hypothesis 1.3.10: Factorial Invariance of the ABS across gender. It was hypothesised that the two-factor structure of the ABS would be invariant across males and females for both Time 1 and Time 2 phases of testing. To test this prediction, multi-group CFA tests of invariance were carried out, with the results presented in Table 6.19. The baseline models where all parameters were freely estimated indicated a good fit to the data (Time 1: $\chi^2 = 450.30$, $df = 66$, RMSEA = .08, CFI = .96, TLI = .95; Time 2: $\chi^2 = 388.71$, $df = 66$, RMSEA = .08, CFI = .97, TLI = .95), providing support for the hypothesis that the ABS measure was reliable for both males and females. To test for invariance between males and females, the goodness-of-fit indices of four additional models, in which factor loadings, correlations/covariances, and uniquenesses were systematically held invariant, were examined. Results showed that the CFI statistic across both time waves was primarily comparable to the baseline model, according to an application

of Cheung and Rensvold's (2002) criteria, indicating complete invariance of the measure.

Table 6.19

Gender Invariance for the ABS at Time 1 and Time 2

	χ^2	<i>df</i>	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	450.30	66	.96	.95	.08
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	462.80	74	.96	.95	.07
Model 3: FL + COVARIANCE (CV) invariant	471.52	77	.96	.95	.07
Model 4: FL + UNIQUENESSES (UN) invariant	551.34	89	.95	.95	.07
Model 5: FL + CV + UN invariant	562.16	92	.95	.95	.07
Time 2					
Model 1: No invariance	388.71	66	.97	.95	.08
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	416.99	74	.96	.95	.07
Model 3: FL + COVARIANCE (CV) invariant	438.02	77	.96	.95	.07
Model 4: FL + UNIQUENESSES (UN) invariant	457.46	89	.96	.96	.07
Model 5: FL + CV + UN invariant	480.63	92	.96	.96	.07

Conclusions for Hypothesis 1.3.10: Factor Invariance of the ABS across gender. In sum, the findings demonstrate that the Mathematics and English domains of academic buoyancy displayed full invariance across factor structure, factor loadings, variances/covariances, and uniquenesses. As such, Hypothesis 1.1.10 was accepted.

Factorial Invariance of the ABS for Year Level

Results for Hypothesis 1.3.11: Factorial Invariance of the ABS across year level. Hypothesis 1.3.11 predicted that the structure of the ABS would be similar across junior and middle year level groupings at Time 1 and Time 2. Table 6.20 shows the results of the multi-group CFAs conducted to assess the invariance of the ABS. The initial baseline models in which no constraints were imposed yielded acceptable fits to the data at Time 1 ($\chi^2 = 412.88$, $df = 66$, RMSEA = .07, CFI = .96, TLI = .95) and Time 2 ($\chi^2 = 346.30$, $df = 66$, RMSEA = .07, CFI = .97, TLI = .96), indicating that the hypothesised model was plausible for both year levels. The results of the subsequent tests of invariance indicated that restrictive constraints placed on

the factor loadings, variances/covariances, and error terms or uniquenesses impacted minimally on the goodness-of-fit indices. Specifically, the change in the CFI statistic across the four successive models within each time wave did not exceed the .01 criteria advised by Cheung and Rensvold (2002). This year level invariance result suggests that in terms of the central constructs, junior and middle high school students are essentially similar across both time points.

Table 6.20

Year Level Invariance for the ABS at Time 1 and Time 2

	χ^2	<i>df</i>	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	412.88	66	.96	.95	.07
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	416.26	74	.96	.96	.07
Model 3: FL + COVARIANCE (CV) invariant	450.33	77	.96	.95	.07
Model 4: FL + UNIQUENESSES (UN) invariant	483.66	89	.96	.96	.07
Model 5: FL + CV + UN invariant	529.34	92	.95	.94	.07
Time 2					
Model 1: No invariance	346.30	66	.97	.96	.07
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	370.57	74	.97	.96	.07
Model 3: FL + COVARIANCE (CV) invariant	426.38	77	.96	.95	.07
Model 4: FL + UNIQUENESSES (UN) invariant	393.28	89	.97	.97	.06
Model 5: FL + CV + UN invariant	454.27	92	.96	.96	.07

Conclusions for Hypothesis 1.3.11: Factor Invariance of the ABS across year level. In conclusion, the ABS demonstrated invariance for junior and middle year level groups in relation to all parameter constraints. Therefore, complete invariance across year levels was found for both Time 1 and Time 2, and Hypothesis 1.3.11 was supported.

Factorial Invariance of the ABS for Setting/Achievement Groups

Results for Hypothesis 1.3.12: Factorial Invariance of the ABS across setting/achievement groups. Hypothesis 1.3.12 predicted that the factorial structure of the ABS would be consistent for high achieving selective students, high achieving comprehensive students, and other achieving comprehensive students across each time wave. Multi-group CFAs were conducted to examine this hypothesis, and the

results are presented in Table 6.21. The first multi-group CFAs allowed all factor loadings, uniquenesses, and correlations/variances to be freely estimated. These baseline models resulted in an acceptable fit to the data (Time 1: $\chi^2 = 543.86$, $df = 103$, RMSEA = .08, CFI = .96, TLI = .94; Time 2: $\chi^2 = 653.14$, $df = 103$, RMSEA = .08, CFI = .96, TLI = .95). Results of the formal tests for invariance indicated that in each successive and more restrictive model, the CFI statistics were comparable to the baseline models, using Cheung and Rensvold's (2002) recommended criteria. These findings suggest that in terms of the hypothesised factor structure of the ABS, selective and comprehensive school students were not substantially different at both time points.

Table 6.21

Setting/Achievement Grouping Invariance for the ABS at Time 1 and Time 2

	χ^2	df	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	543.87	103	.96	.94	.08
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	570.23	123	.96	.95	.08
Model 3: FL + COVARIANCE (CV) invariant	572.35	125	.96	.95	.07
Model 4: FL + UNIQUENESSES (UN) invariant	614.24	143	.95	.95	.07
Model 5: FL + CV + UN invariant	617.16	145	.95	.95	.07
Time 2					
Model 1: No invariance	653.14	103	.96	.95	.08
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	683.22	123	.96	.95	.08
Model 3: FL + COVARIANCE (CV) invariant	695.32	125	.96	.95	.08
Model 4: FL + UNIQUENESSES (UN) invariant	743.86	143	.95	.95	.08
Model 5: FL + CV + UN invariant	757.68	145	.95	.95	.08

Conclusions for Hypothesis 1.3.12: Factor Invariance of the ABS across setting/achievement groups. In summary, the structure of the ABS was found to be invariant across the three school setting/achievement groupings. Invariance was achieved for factor structure, factor loadings, variances/covariances, and uniquenesses, thus exhibiting complete model invariance. Therefore, Hypothesis 1.3.12 was accepted.

Psychometric Properties of the Index of Achievement Press (IAP)

Distribution and Reliability of the IAP

Results for Hypothesis 1.1.5: Normality and reliability of the IAP.

Hypothesis 1.1.5 predicted that tests of normality would demonstrate a normal distribution of the IAP subscales. Additionally, based on prior research results (Adams & Wu, 2002—see Chapter 5) it was hypothesised that reliability tests would demonstrate lowered, but acceptable levels of internal consistency. The distributional data displayed in Table 6.22 indicate that the constructs of Teacher and Parent pressure to achieve were approximately normally distributed. In regard to the internal consistency of the factors, the Teacher subscale produced lowered Cronbach's alpha values for both time points. However, as the value was close to the .60 required for exploratory research (Nunnally, 1978), particularly at Time 2, the subscale was retained for the present study, although results must be interpreted with caution. The Cronbach's alpha values for the Parent pressure to achieve subscale were deemed acceptable.

Table 6.22

Descriptive Statistics and Cronbach's Alpha Reliability Values for the IAP

	Mean	Standard Deviation	Skewness	Kurtosis	Cronbach's α
Time 1					
Teacher	4.87	1.01	-.46	.29	.54
Parent	5.19	.68	-.101	1.06	.69
Time 2					
Teacher	4.81	.70	-.72	1.06	.58
Parent	5.12	.73	-.81	.85	.70

Conclusions for Hypothesis 1.1.5: Normality and reliability of the IAP. In

conclusion, the results demonstrate that the factors of the IAP possessed normal distributional properties. Whilst the Teacher pressure to achieve construct produced borderline internal consistency results, it was deemed appropriate for use, but with results to be interpreted with caution. The Parent pressure to achieve factor demonstrated acceptable internal consistency. As such, Hypothesis 1.1.5 was accepted with this caveat.

Factor Structure of the IAP

Results for Hypothesis 1.2.5: Factor structure of the IAP. It was predicted that data would support a sound two-factor structure of the newly adapted IAP for Time 1 and Time 2. CFAs were conducted for each time point, in which all 8 items were freed to load on their designated factor, and all other factor loadings were constrained to be zero. Results of the CFAs are presented in Table 6.23, and indicate that the two-factor model provided an excellent fit to the data at Time 1 ($\chi^2 = 81.41$, $df = 15$, RMSEA = .05, CFI = .98, TLI = .97) and Time 2 ($\chi^2 = 82.98$, $df = 15$, RMSEA = .05, CFI = .98, TLI = .96). Inspection of the item loadings for the Teacher and Parent subscales showed that the constructs were well defined, with values above the .30 requirement (Hills, 2008), ranging from .39 to .75 for Time 1, and .41 to .76 for Time 2.

Table 6.23

Factor Loadings for the IAP

Time 1				
	Item 1	Item 2	Item 3	Item 4
Teacher	.75	.39	.40	.54
Parent	.72	.46	.60	.67
Time 2				
	Item 1	Item 2	Item 3	Item 4
Teacher	.76	.41	.46	.60
Parent	.72	.50	.61	.70

Conclusions for Hypothesis 1.2.5: Factor structure of the IAP. Results of the CFA demonstrate support for the two-factor structure of the newly adapted IAP at Time 1 and Time 2. The goodness-of-fit indices and factor loadings supported the use of the IAP in the present investigation. As such Hypothesis 1.2.5 was accepted.

Factorial Invariance of the IAP for Gender

Results for Hypothesis 1.3.13: Factorial invariance of the IAP across gender. It was hypothesised that the two-factor structure of the IAP would be similar for both males and females at Time 1 and Time 2, as demonstrated by multi-group CFA tests of invariance. The results, presented in Table 6.24, show that the initial baseline models in which all parameters were freely estimated across the groups, yielded a good fit to the data at both time points (Time 1: $\chi^2 = 149.26$, $df = 36$, RMSEA = .06, CFI = .97, TLI = .95; Time 2: $\chi^2 = 167.82$, $df = 36$, RMSEA = .06,

CFI = .96, TLI = .94). Measured against Cheung and Rensvold's (2002) criteria, the CFI statistic across both time waves was unchanged when compared with the baseline model, following the imposition of constraints on the factor loadings (Model 2) and the variances/covariances (Model 3). Further restrictions placed on the uniquenesses in Model 4 and Model 5, however, resulted in changes to the CFI in excess of the .01 criterion.

Table 6.24

Gender Invariance for the IAP at Time 1 and Time 2

	χ^2	<i>df</i>	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	149.26	36	.97	.95	.06
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	157.97	44	.97	.96	.05
Model 3: FL + COVARIANCE (CV) invariant	158.57	45	.97	.96	.05
Model 4: FL + UNIQUENESSES (UN) invariant	260.27	56	.94	.94	.06
Model 5: FL + CV + UN invariant	260.28	57	.94	.94	.06
Time 2					
Model 1: No invariance	167.82	36	.96	.94	.06
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	201.40	44	.96	.94	.06
Model 3: FL + COVARIANCE (CV) invariant	201.42	45	.96	.95	.06
Model 4: FL + UNIQUENESSES (UN) invariant	297.02	56	.93	.93	.07
Model 5: FL + CV + UN invariant	298.42	57	.93	.93	.07

Conclusions for Hypothesis 1.3.13: Factorial invariance of the IAP across gender. In sum, the structure of the IAP was the same for males and females in regard to factor structure, factor loadings, and variances/covariances, thus exceeding the minimum requirements for invariance (Byrne, 1998; Cheung & Rensvold, 2002). However, the error terms of the model cannot be regarded as equivalent. It was concluded that the IAP met the requirement for invariance across gender, and Hypothesis 1.3.13 was accepted.

Factorial Invariance of the IAP for Year Level

Results for Hypothesis 1.3.14: Factorial invariance of the IAP across year level. Hypothesis 1.3.14 predicted that the factor structure of the IAP would be similar for junior and middle year level groups at Time 1 and Time 2, as

demonstrated by CFA tests of invariance. From Table 6.25, it can be seen that the initial multi-group models (Model 1), where all parameters were set to be completely free between the year level groups, demonstrated a good fit to the data at Time 1 ($\chi^2 = 117.79$, $df = 36$, RMSEA = .05, CFI = .98, TLI = .97) and Time 2 ($\chi^2 = 132.84$, $df = 36$, RMSEA = .05, CFI = .98, TLI = .97), thus supporting the construct validity of the measure across year levels. With regard to Time 1, the placement of constraints on the factor loadings, variances/covariances, and correlated uniquenesses resulted in negligible changes to the CFI statistic, compared to the baseline model. Hence, the IAP was completely invariant across year level groupings at Time 1. In relation to Time 2, when factor loadings and variances/covariances were constrained in the second and third models respectively, only minimal changes were evident in the CFI, thus meeting the minimal requirement for factorial invariance (Byrne, 1998; Cheung & Rensvold, 2002). When error term or uniqueness constraints were imposed on the model, the CFI showed a change in value of greater than .01 in comparison to the baseline model. Thus, these aspects of the IAP cannot be considered invariant for Time 2.

Table 6.25

Year Level Invariance for the IAP at Time 1 and Time 2

	χ^2	df	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	117.79	36	.98	.97	.05
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	132.84	44	.98	.97	.05
Model 3: FL + COVARIANCE (CV) invariant	133.82	45	.98	.97	.05
Model 4: FL + UNIQUENESSES (UN) invariant	176.61	56	.97	.97	.05
Model 5: FL + CV + UN invariant	178.85	57	.97	.97	.05
Time 2					
Model 1: No invariance	132.84	36	.98	.97	.05
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	131.70	44	.98	.97	.05
Model 3: FL + COVARIANCE (CV) invariant	133.97	45	.97	.97	.05
Model 4: FL + UNIQUENESSES (UN) invariant	207.56	56	.96	.96	.06
Model 5: FL + CV + UN invariant	212.72	57	.96	.96	.06

Conclusions for Hypothesis 1.3.14: Factorial invariance of the IAP across year level. As predicted, the IAP was found to be invariant across junior and middle year level groupings in relation to all parameters for Time 1, and in relation to factor structure, factor loadings, and variances/covariances. Therefore, support was found for the invariance of the IAP across year level groups, and Hypothesis 1.3.14 was accepted.

Factorial Invariance of the IAP for Setting/Achievement Groups

Results for Hypothesis 1.3.15: Factorial invariance of the IAP across setting/achievement groups. Hypothesis 1.3.15 predicted that the factor structure of the IAP would be a consistent measure for selective, high achievement comprehensive, and other achievement comprehensive students, across both time waves of data. The results of the tests of invariance for achievement groups are presented in Table 6.26. The baseline multi-group models with no restrictions placed on the parameters produced good fits to the data at both time points (Time 1: $\chi^2 = 273.14$, $df = 57$, RMSEA = .07, CFI = .96, TLI = .94; Time 2: $\chi^2 = 194.82$, $df = 57$, RMSEA = .05, CFI = .98, TLI = .96), indicating a consistent factor structure for the three groups. When Time 1 and Time 2 factor loadings and variances/covariances were constrained in the second and third models respectively, only minimal changes were evident in the fit statistics, compared to the baseline model. Hence, the IAP met the minimum requirement for invariance across achievement groupings (Byrne, 1998; Cheung & Rensvold, 2002). When constraints were placed on the factor uniquenesses in the fourth and fifth models, changes in the CFI of greater than .01 resulted. Thus, full invariance could not be concluded.

Conclusions for Hypothesis 1.3.15: Factor invariance of the IAP across setting/achievement groups. In conclusion, the structure of the IAP was found to be invariant for selective students, and for comprehensive students of high and other achievement levels in relation to factor structure, factor loadings, and variances/covariances. Whilst invariance was not found for the error terms, the IAP satisfied the minimum requirement for invariance as per Byrne (1998) and Cheung and Rensvold (2002).

Table 6.26

Setting/Achievement Grouping Invariance for the IAP at Time 1 and Time 2

	χ^2	<i>df</i>	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	273.14	57	.96	.94	.07
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	311.58	73	.95	.94	.06
Model 3: FL + COVARIANCE (CV) invariant	315.25	75	.95	.94	.06
Model 4: FL + UNIQUENESSES (UN) invariant	470.15	97	.94	.94	.07
Model 5: FL + CV + UN invariant	473.64	99	.94	.94	.06
Time 2					
Model 1: No invariance	194.82	57	.98	.96	.05
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	220.30	73	.98	.97	.05
Model 3: FL + COVARIANCE (CV) invariant	223.74	75	.98	.97	.05
Model 4: FL + UNIQUENESSES (UN) invariant	327.28	97	.96	.96	.06
Model 5: FL + CV + UN invariant	334.06	99	.96	.96	.06

Psychometric Properties of the Depression, Anxiety, and Stress-21 (DASS-21) Subscales

Distribution and Reliability of the DASS-21 Subscales

Results for Hypothesis 1.1.6: Normality and reliability of the DASS-21 subscales. Hypothesis 1.1.6 predicted that the DASS-21 subscales of Depression and Anxiety would exhibit normality and internal consistency, as demonstrated by tests of distribution and reliability. As shown in Table 6.27, the two constructs were approximately normally distributed at Time 1 and Time 2 testing points. Tests of reliability produced Cronbach's alpha values above the required .70 for research purposes (Hills, 2008), thus supporting the consistency of the factors for both time waves.

Conclusions for Hypothesis 1.1.6: Normality and reliability of the DASS-21 subscales. As hypothesised, the findings demonstrated that the Depression and Anxiety subscales of the DASS-21 measure utilised in the present study were normally distributed and reliable at Time 1 and Time 2 phases of testing. As such, Hypothesis 1.1.6 was accepted.

Table 6.27

Descriptive Statistics and Cronbach's Alpha Reliability Values for the DASS-21 Subscales

	Mean	Standard Deviation	Skewness	Kurtosis	Cronbach's α
Time 1					
Depression	7.87	8.61	1.54	2.18	.87
Anxiety	7.49	7.01	1.40	2.08	.76
Time 2					
Depression	7.99	9.02	1.63	2.55	.89
Anxiety	7.01	7.09	1.60	2.99	.80
Scoring	Normal	Mild	Moderate	Severe	Extremely Severe
Depression	0-9	10-13	14-20	21-27	28+
Anxiety	0-7	8-9	10-14	15-19	20+

Factor Structure of the DASS-21 Subscales

Results for Hypothesis 1.2.6: Factor structure of the DASS-21 subscales.

It was hypothesised that data would support a sound, two-factor structure underpinning the Depression and Anxiety subscales of the DASS-21 at Time 1 and Time 2. To test this hypothesis, two highly restrictive CFAs were conducted on the factor structure, in which all 14 items were constrained to load only on their respective factors. Results of the CFAs are presented in Table 6.28, and indicate that the two-factor model provided a good fit to the data at both time points (Time 1: $\chi^2 = 776.71$, $df = 76$, RMSEA = .07, CFI = .93, TLI = .92; Time 2: $\chi^2 = 657.67$, $df = 76$, RMSEA = .07, CFI = .95, TLI = .94). The factor loadings indicated that both factors were well defined, with each factor loading being statistically significant and substantial in size (Time 1: range .42 to .77; Time 2: range .48 to .84). Effectively, all items loaded highly on their designated factors, above the required .30 value (Hills, 2008). Additionally, the correlations between the two factors of the DASS-21 were .80 and .76 at Time 1 and Time 2 respectively. Although moderate, the correlations remain well below the .90 level potentially indicative of multicollinearity (Hills, 2008), and were logically expected, due to the strong positive relation between the two facets.

Conclusions for Hypothesis 1.2.6: Factor structure of the DASS-21

subscales. The results of the CFAs assessing the two-factor model of the DASS-21 subscales demonstrated acceptable goodness-of-fit indices, factor loadings, and

factor correlations for the hypothesised model. The use of the Depression and Anxiety subscales was supported in the present investigation; thus, Hypothesis 1.2.6, regarding the validity of the factor structure of the DASS-21 subscales, was accepted.

Table 6.28

Factor Loadings for the DASS-21 Subscales

Time 1							
	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7
Depression	.67	.51	.73	.77	.69	.76	.73
Anxiety	.42	.49	.58	.64	.72	.50	.61
Time 2							
	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7
Depression	.75	.53	.79	.79	.73	.79	.84
Anxiety	.48	.59	.59	.61	.69	.61	.67

Factorial Invariance of the DASS-21 Subscales for Gender**Results for Hypothesis 1.3.16: Factorial invariance of the DASS-21**

subscales across gender. Hypothesis 1.3.16 predicted that the factor structure of the DASS-21 subscales would be similar for males and females at Time 1 and Time 2 as tested by CFA tests of invariance. Table 6.29 demonstrated that the initial multi-group CFAs, in which all parameters were freely estimated, showed acceptable fits to the data at Time 1 ($\chi^2 = 1017.81$, $df = 164$, RMSEA = .07, CFI = .92, TLI = .91) and Time 2 ($\chi^2 = 845.66$, $df = 164$, RMSEA = .07, CFI = .94, TLI = .93), indicating that the a priori factor structure was plausible for both males and females. The subsequent placement of increasing restrictions on various aspects of the factor structure produced little deterioration in the CFI statistic as compared to the baseline model. Specifically, application of the recommended criteria for invariance (Cheung & Rensvold, 2002) illustrated that the CFI did not change in excess of .01 when the factor structure, factor loadings, variances/covariances, and uniquenesses were constrained to be equal across both time waves. Thus, the DASS-21 subscales showed complete factorial invariance across gender groups.

Conclusions for Hypothesis 1.3.16: Factorial invariance of the DASS-21

subscales across gender. The findings demonstrate that not only did the Depression and Anxiety subscales of the DASS-21 meet the minimal requirement for invariance of factor structure and factor loadings across gender (Byrne; 1998; Cheung &

Rensvold, 2002), but that they were also invariant across variances/covariances and error terms. Thus, the DASS-21 subscales exhibited full factorial invariance across gender for Time 1 and Time 2 phases of testing. As such, Hypothesis 1.3.16 was accepted.

Table 6.29

Gender Invariance for the DASS-21 Subscales at Time 1 and Time 2

	χ^2	<i>df</i>	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	1017.81	164	.92	.91	.07
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	1042.49	176	.92	.91	.07
Model 3: FL + COVARIANCE (CV) invariant	1046.74	179	.92	.91	.07
Model 4: FL + UNIQUENESSES (UN) invariant	1093.28	190	.91	.92	.07
Model 5: FL + CV + UN invariant	1096.79	193	.91	.92	.07
Time 2					
Model 1: No invariance	845.66	164	.94	.93	.07
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	886.33	176	.93	.93	.07
Model 3: FL + COVARIANCE (CV) invariant	889.10	179	.93	.93	.07
Model 4: FL + UNIQUENESSES (UN) invariant	923.24	190	.93	.94	.07
Model 5: FL + CV + UN invariant	926.54	193	.93	.94	.07

Factorial Invariance of the DASS-21 Subscales for Year Level

Results for Hypothesis 1.3.17: Factorial invariance of the DASS-21 subscales across year level. Hypothesis 1.3.17 predicted that the subscales of the DASS-21 would be consistent measures across junior and middle year level student groups at Time 1 and Time 2 testing points. Multi-group CFA tests of invariance were utilised to test this hypothesis. The first multi-group CFAs for year level allowed all factor loadings, variances/covariances, and correlated uniquenesses to be freely estimated. These baseline models yielded acceptable fits with the data (Time 1: $\chi^2 = 999.37$, $df = 164$, RMSEA = .07, CFI = .92, TLI = .91; Time 2: $\chi^2 = 845.66$, $df = 164$, RMSEA = .07, CFI = .94, TLI = .93). Results for Time 1 and Time 2 are presented in Table 6.30, and demonstrate that when successive aspects of the factor structure were held invariant across year level groups, the fit indices remained comparable across the five models. Specifically, the CFI statistic produced no change

greater than .01 (Cheung & Rensvold, 2002), even when Model 5 saw the imposition of complete invariance across the factor loadings, variances/covariances, and correlated uniqueness parameters tested. Therefore, the DASS-21 subscales met the requirements for a fully invariant model across year level groups at both time points.

Table 6.30

Year Level Invariance for the DASS-21 Subscales at Time 1 and Time 2

	χ^2	<i>df</i>	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	999.37	164	.92	.91	.07
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	1015.04	176	.92	.91	.07
Model 3: FL + COVARIANCE (CV) invariant	1046.71	179	.91	.91	.07
Model 4: FL + UNIQUENESSES (UN) invariant	1111.70	190	.91	.91	.07
Model 5: FL + CV + UN invariant	1153.72	193	.91	.91	.07
Time 2					
Model 1: No invariance	889.37	164	.93	.93	.07
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	915.05	176	.93	.93	.07
Model 3: FL + COVARIANCE (CV) invariant	919.27	179	.93	.93	.07
Model 4: FL + UNIQUENESSES (UN) invariant	985.57	190	.93	.93	.07
Model 5: FL + CV + UN invariant	992.01	193	.93	.93	.07

Conclusions for Hypothesis 1.3.17: Factorial invariance of the DASS-21 subscales across year level.

In conclusion, the DASS-21 subscales were fully invariant in relation to factor structure, factor loadings, variances/covariances, and correlated uniquenesses across year level groups at Time 1 and Time 2. Therefore, Hypothesis 1.3.17 was supported.

Factorial Invariance of the DASS-21 Subscales for Setting/Achievement Groups

Results for Hypothesis 1.3.18: Factorial invariance of the DASS-21

subscales across setting/achievement groups. Hypothesis 1.3.18 predicted that the factor structure of the Depression and Anxiety subscales of the DASS-21 measure would be consistent for the three school setting/achievement groups at each time wave. To test this prediction, CFA tests of invariance were conducted: the results are presented in Table 6.31. The initial multi-group CFAs, being completely free models in which no constraints were placed on the parameters between groups, yielded an

acceptable fit to the data at Time 1 ($\chi^2 = 1152.57$, $df = 252$, RMSEA = .07, CFI = .92, TLI = .91) and Time 2, ($\chi^2 = 1051.61$, $df = 252$, RMSEA = .07, CFI = .93, TLI = .92). This indicated a consistent factor structure for selective students, high achieving comprehensive students, and other achieving comprehensive students. The formal tests for invariance followed, with differing results produced for each phase of testing. With regard to Time 1, the imposition of constraints on the factor loadings and variances/covariances in Model 2 and Model 3 respectively, produced negligible changes in the CFI statistic compared to the baseline model, thus meeting and exceeding the minimal requirements for invariance (Byrne, 1998; Cheung & Rensvold, 2002) at Time 1. However, the placement of constraints on the error terms or uniquenesses in Model 4 and Model 5 resulted in a change in the CFI exceeding the .01 criteria (Cheung & Rensvold, 2002). For Time 2, results indicated that in each of the four additional models, the CFI was comparable using Cheung and Rensvold's (2002) recommended criteria. Hence, the DASS-21 subscales were fully invariant for setting/achievement groupings at Time 2. These findings support the notion that the factor structure of the DASS-21 subscales was similar across selective and comprehensive high school students.

Conclusions for Hypothesis 1.3.18: Factorial invariance of the DASS-21 subscales across setting/achievement groups. In conclusion, the structure of the DASS-21 subscales was found to be invariant for selective and comprehensive school groups in relation to factor structure and factor loadings at Time 1, and furthermore across variances/covariances and error terms for Time 2. Therefore, the invariance of the DASS-21 subscales across setting/achievement groupings was established, and Hypothesis 1.3.18 was supported.

Table 6.31

Setting/Achievement Grouping Invariance for the DASS-21 Subscales at Time 1 and Time 2

	χ^2	<i>df</i>	CFI	TLI	RMSEA
Time 1					
Model 1: No invariance	1152.57	252	.92	.91	.07
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	1245.26	280	.92	.91	.07
Model 3: FL + COVARIANCE (CV) invariant	1252.23	282	.91	.91	.07
Model 4: FL + UNIQUENESSES (UN) invariant	1609.92	308	.89	.90	.08
Model 5: FL + CV + UN invariant	1611.61	310	.89	.90	.08
Time 2					
Model 1: No invariance	1051.61	252	.93	.92	.07
Model 2: FIRST-ORDER FACTOR LOADINGS (FL) invariant	1133.55	280	.93	.93	.07
Model 3: FL + COVARIANCE (CV) invariant	1142.44	282	.93	.93	.07
Model 4: FL + UNIQUENESSES (UN) invariant	1313.85	308	.92	.93	.07
Model 5: FL + CV + UN invariant	1318.66	310	.92	.93	.07

Psychometric Properties of the Instrument Battery

In the final section of this chapter, the psychometric properties of the battery of instruments are examined. Although the properties of each individual instrument were assessed separately, it is also necessary to ascertain whether a method effect was operating when the instrumentation was administered simultaneously to respondents. Specifically, it was important to ascertain whether or not the structural integrity of each individual measure was upheld when all instrumentation was combined into a single CFA.

Multiple Scales CFA

Results for Research Question 1.2.7: Structural integrity of the assessment battery. Research Question 1.2.7 asked whether the factor structure of the individual measures would be upheld at Time 1 and Time 2, despite all of the instruments being combined into one assessment battery. Additionally, the network of relations between latent factors was of interest, in order to determine whether the factors were related in a logical and theoretically coherent manner. In order to answer these questions, a single multi-scale CFA was performed for Time 1 and Time 2, whereby all 13 factors and their respective 76 items were simultaneously

examined. The models tested at each time point were highly restrictive, items were designated to load only on their respective factors, and all other factor loadings were constrained to be zero.

Results of the CFAs testing the first-order factors of Mathematics, Spelling, and Sentence Comprehension academic achievement, Mathematics and English academic self-concept, General School and Parent Relations self-concept, Parent and Teacher pressure to achieve, Mathematics and English academic buoyancy, and Depression and Anxiety, indicated that each of the models provided a good fit to the data at Time 1 ($\chi^2 = 8018.76$, $df = 2681$, RMSEA = .03, CFI = .94, TLI = .94) and Time 2 ($\chi^2 = 7326.98$, $df = 2681$, RMSEA = .03, CFI = .94, TLI = .94). Considering the values of the RMSEA and the restrictiveness of the model at both time points, such results were encouraging, and suggested that the individual factors of the instruments could be differentiated even if they were embedded with other instruments. The factor loadings exceeded the minimum criteria of .30 (Hills, 2008), and were statistically significant (Time 1 range = .41 to .91; Time 2 range = .47 to .93), indicating that the constructs were well defined. As these loadings were similar to those already presented in this chapter for each individual instrument, they are not repeated here.

The factor correlations between the 13 latent factors for Time 1 and Time 2 are presented in Table 6.32 and Table 6.33 respectively. Correlations between the factors ranged from -.50 to .79 at Time 1 and -.50 to .75 at Time 2. The mean correlation at Time 1 was .25 and .22 at Time 2, with all correlations less than .80. The lowest correlation at Time 1 occurred between the English academic buoyancy subscale and the Mathematics academic achievement factor ($r = -.01$), and between the Mathematics academic buoyancy subscale and the Spelling academic achievement factor at Time 2 ($r = .007$). These low correlations suggest little relation between these variables, and are logical in nature, due to the domain-specific nature of the constructs. The highest correlations at both time points occurred between the Depression and Anxiety subscales (Time 1: $r = .79$; Time 2: $r = .75$). This finding indicates that the more depressed one feels in one's general life, the more anxious one feels (and vice-versa). Again, this is a logical association. To add to the discriminant validity, it could be observed that the maladaptive constructs of Depression and Anxiety were negatively related to the more positive constructs—for example, Mathematics and English academic buoyancy.

Table 6.32

Factor Correlations for the Multiple Scales CFA at Time 1

	MA	SA	SCA	MSC	ESC	GSSC	PRSC	MAB	EAB	TPTA	PPTA	DEP	ANX
MA	-												
SA	.67	-											
SCA	.58	.74	-										
MSC	.53	.25	.16	-									
ESC	-.03	.15	.23	.15	-								
GSSC	.21	.21	.25	.63	.66	-							
PRSC	-.12	-.09	-.09	.14	.25	.27	-						
MAB	.21	.09	.09	.60	.26	.28	.55	-					
EAB	-.01	.04	.10	.24	.60	.29	.52	.68	-				
TPTA	.05	.05	.01	.22	.28	.35	.18	.20	.13	-			
PPTA	.19	.11	.06	.25	.15	-.03	.21	.20	.08	.68	-		
DEP	-.02	.01	-.04	-.22	-.23	-.50	-.28	-.38	-.36	.00	.09	-	
ANX	-.09	-.11	-.17	-.20	-.20	-.32	-.24	-.38	-.34	.06	.11	.79	-

Note. MA = Mathematics achievement; SA = Spelling achievement; SCA = Sentence Comprehension achievement; MSC = Mathematics self-concept; ESC = English self-concept; GSSC = General School self-concept; PRSC = Parent Relations self-concept; MAB = Mathematics academic buoyancy; EAB = English academic buoyancy; TPTA = Teacher pressure to achieve; PPTA = Parent pressure to achieve; DEP = Depression; ANX = Anxiety.

Table 6.33

Factor Correlations for the Multiple-Scales CFA at Time 2

	MA	SA	SCA	MSC	ESC	GSSC	PRSC	MAB	EAB	TPTA	PPTA	DEP	ANX
MA	-												
SA	.70	-											
SCA	.55	.75	-										
MSC	.44	.15	.11	-									
ESC	-.02	.11	.21	.10	-								
GSSC	.16	.11	.23	.58	.63	-							
PRSC	-.05	-.11	-.04	.18	.21	.31	-						
MAB	.14	.01	.02	.54	.20	.28	.44	-					
EAB	-.04	-.04	.06	.13	.56	.28	.42	.66	-				
TPTA	.06	.03	.05	.15	.22	.23	.23	.15	.11	-			
PPTA	.19	.12	.06	.21	.11	.04	.17	.14	.05	.68	-		
DEP	-.02	.03	-.05	-.14	-.18	-.49	-.24	-.32	-.32	-.01	.07	-	
ANX	-.05	-.06	-.14	-.13	-.14	-.30	-.17	-.32	-.30	.07	.11	.75	-

Note. MA = Mathematics achievement; SA = Spelling achievement; SCA = Sentence Comprehension achievement; MSC = Mathematics self-concept; ESC = English self-concept; GSSC = General School self-concept; PRSC = Parent Relations self-concept; MAB = Mathematics academic buoyancy; EAB = English academic buoyancy; TPTA = Teacher pressure to achieve; PPTA = Parent pressure to achieve; DEP = Depression; ANX = Anxiety.

Conclusions for Research Question 1.2.7: Structural integrity of the assessment battery. In sum, the findings demonstrate that placing the individual instruments together in a multi-scale CFA did not alter the validity of each individual measure: the distinctiveness of the constructs even when embedded with other measures, was supported. Each instrument maintained its proposed factor structure, produced acceptable factor loadings, and generated excellent fit indices. As such, concerns about method effects in simultaneous administration are lessened.

Chapter Summary

This chapter has presented the results emanating from Study 1 pertaining to the psychometric properties of the quantitative instrumentation at Time 1 and Time 2 phases of testing. The assessment of each measure was undertaken via reliability analyses, confirmatory factor analysis, and invariance testing and established that the central constructs and instrumentation utilised exhibited sound internal consistency, strong construct validity, and invariance across critical groups. The results presented in this chapter, and their implications in relation to future research and practice, are discussed in Chapter 9. Now that the within-construct relations have been examined and satisfied, the next chapter turns to an investigation of the between-construct relations between school setting and various academic achievement and psychosocial outcomes.

CHAPTER 7 RESULTS OF STUDY 2: THE QUANTITATIVE IMPACT OF DIFFERING SCHOOL SETTINGS ON HIGH ACHIEVING STUDENTS' ACHIEVEMENT AND PSYCHOSOCIAL WELLBEING OUTCOMES, THE RECIPROCAL RELATIONS BETWEEN PSYCHOSOCIAL WELLBEING AND ACHIEVEMENT, AND THE ROLE OF CULTURAL HERITAGE

Introduction

The strong psychometric results presented in Chapter 6 demonstrate that the multidimensional measures used in the present investigation were normally distributed, reliable, valid, and invariant across gender, year level, and school setting/academic achievement level. These findings establish support for a strong within-construct foundation that permits the between-construct analyses to be conducted, confident that the measurement instruments are stable in meaning across groups, and that any differences found are not attributable to measurement error (Byrne, 2003; Marsh, Ellis, et al., 2005). The next phase of this investigation sought firstly to examine how different educational settings (academically selective and mixed-achievement level comprehensive schools) may impact differentially on the academic achievement and psychosocial wellbeing of their students over time, by undertaking SEM analyses.

Secondly, it aimed to uncover the individual characteristics that serve to enhance or impede students' psychosocial wellbeing and academic success. In order to achieve this, multi-group moderating analyses were employed to examine the shared relations between the psychosocial wellbeing and academic achievement constructs across the two time points, and whether these relations were similar or different for each of the school setting/academic achievement groupings (selective, high achievement comprehensive, and other achievement comprehensive). Lastly, based on the qualitative findings, multi-group moderating analyses were employed to examine the impact of the students' diverse cultural backgrounds on academic achievement and select psychosocial outcomes over time, and whether these relations

were similar or different across the two comprehensive school achievement groupings (high and other achievement) being examined.

Overview of the Analyses

The analyses in this chapter are presented in accordance with the hypotheses and research questions outlined in Chapter 4. As described in Chapter 5, all analyses were performed using SEM, a statistical technique that combines the features of factor analysis, path analysis, and regression into a unified statistical application, in order to test and estimate relations among constructs (Byrne, 1998). Three main sets of analyses were conducted to answer the central research questions, a brief outline of which is presented below (see Chapter 5 for full description).

Firstly, in order to identify any differential impact of attending a selective or comprehensive school for high achieving students with regard to their academic achievement and psychosocial wellbeing across time, the sample of students was divided into three groups based in part on their academic performance: selective ($n = 429$), high achievement comprehensive ($n = 270$), and other achievement comprehensive ($n = 1049$). Comparisons between the aforementioned groups were then performed across each of the constructs, controlling for SES, culture, and prior academic achievement (where appropriate with academically focused constructs) using longitudinal SEM analyses. The comparisons made were: (i) selective students compared to high achieving comprehensive students; and (ii) high achieving comprehensive students compared to other achievement comprehensive students. Analyses were conducted as total effects (without controlling for prior levels of the construct under consideration) and as change over time (controlling for any prior differences in the construct under study).

The second main set of analyses was conducted using SEM multi-group analyses, in order to examine the relations between the Time 1 psychosocial variables and the Time 2 achievement outcomes and the relations between the achievement constructs at Time 1 and the psychosocial outcomes at Time 2 across the three school setting/academic achievement groupings. In an extension of the path analysis technique, moderating analysis, or invariance of the causal structure analysis (Byrne, 2011) was used, to examine whether and how the predictive relations would vary for selective, high achievement comprehensive, and other achievement comprehensive student groups. This was done by simultaneously estimating and

comparing three predictive models across the school setting/academic achievement groups. Where significant predicative relations were found, a Wald chi-square test of parameter equalities (Muthén & Muthén, 1998-2007) was then used to determine whether the three models overall held significantly different predictive paths across the groups. If the Wald test was significant, then pairwise contrasts were conducted to determine the particular paths that differed between the groups.

The final set of analyses was driven by the findings emanating from the qualitative component of this study, which indicated that cultural background (Anglo Australian and Asian Australian) plays an important role in the students' academic achievement and also in certain psychosocial factors, namely: academic self-concept, relations with parents, and pressure to achieve from parents. As such, multi-group moderating analyses (as described above) were used to assess the predictive relations between cultural background and the outcomes, and whether the strength of the predictive paths varied across high achievement comprehensive (Anglo Australian $n = 116$; non-Anglo Australian $n = 153$) and other achievement comprehensive (Anglo Australian $n = 556$; non-Anglo Australian $n = 483$) student groups. As explained in Chapter 5, the selective student group was excluded from these analyses due to violations of sample size requirements.

Whilst fit indices are critical for the assessment of measurement (CFA) models, as in Chapter 6, the emphasis of the longitudinal path models in the present chapter is instead on the structural model and on the size and significance of the predictive beta paths. Although lower fit indices than are usually acceptable may be observed, this will largely be due to unspecified parameters that are not relevant to the hypotheses and to theoretical conceptualisation of the structural models at hand.

The Impact of Different Educational Settings on Academic Achievement Mathematics Achievement

Results for Research Question 2.1.1: Selective compared to high achievement comprehensive students on Mathematics achievement. Research Question 2.1.1 asked whether there were any significant differences between high achieving selective students and high achieving comprehensive students in relation to their Mathematics achievement at Time 1 or Time 2, in terms of total effects and change over time. To answer this question, a longitudinal SEM with a comparison between the groups on Time 1 and Time 2 Mathematics achievement scores was

performed. In interpreting the results, selective students were coded as -1, and high achieving comprehensive students as +1 in the comparison. Hence, a negative beta indicated that the selective students had higher scores than the high achieving comprehensive students; a positive beta indicated that the high achieving comprehensive students had higher scores than the selective students.

As shown in Table 7.1, significant total effects at both time points were found. Specifically, controlling for SES and cultural background, the selective students performed significantly better in Mathematics than did the high achieving comprehensive students at Time 1 and Time 2. Moreover, when prior Time 1 Mathematics achievement was also controlled for, the selective students made significant gains in Mathematics at Time 2 over and above their achievement at Time 1, compared to the high achieving comprehensive students. The beta paths show that the effect sizes for these findings were moderate to large (Cohen, 1988), indicating that attending a selective school explained an important amount of variance in higher Mathematics achievement scores.

Table 7.1

Comparison of Mathematics Achievement Outcomes across Selective and High Achieving Comprehensive Student Groups

	Mathematics Achievement T1	Mathematics Achievement T2		
Selective vs. HAC	β	β		
Total Effects	-.516***	-.515***		
Change Over Time	-	-.248***		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
558.25	223	.93	.92	.05

Note. HAC = high achievement comprehensive; T1 = Time 1; T2 = Time 2. Selective students were coded -1 and high achieving comprehensive students were coded +1.

*** $p < .001$

Conclusions for Research Question 2.1.1: Selective compared to high achievement comprehensive students on Mathematics achievement. In response to Research Question 2.1.1, compared with high achieving students in comprehensive schools, selective students performed significantly better in Mathematics initially, and continued to improve significantly over time.

Results for Hypothesis 2.1.2: High achievement comprehensive students compared to other achievement comprehensive students on Mathematics achievement. Hypothesis 2.1.2 predicted that high achieving comprehensive students would have significantly higher achievement in Mathematics than the other achieving comprehensive students at both time points, with regard to total effects and change over time. A longitudinal SEM with a comparison between the groups on Time 1 and Time 2 Mathematics achievement scores was performed to test the hypothesis. In interpreting the results, high achieving comprehensive students were coded as -1 and other achievement comprehensive students as +1 in the comparison. Hence, a negative beta indicated that the high achieving comprehensive students had higher scores than the other achieving comprehensive students; a positive beta indicated that the other achieving comprehensive students had higher scores than the high achieving comprehensive students.

As displayed in Table 7.2, significant total effects at both time points were found. That is, controlling for SES and cultural background, the high achieving comprehensive students performed significantly better in Mathematics than the students of lower achievement levels at their school at both time points. The effect sizes for the total effects were moderate to large (Cohen, 1988), suggesting that being a comprehensive school high achiever accounted for a substantial amount of variance in higher Mathematics achievement. In examining change over time however, when the influence of prior Time 1 Mathematics achievement was also controlled for, the high achieving comprehensive students showed no significant growth over time in Mathematics at Time 2, compared to their other achievement level counterparts.

Conclusions for Hypothesis 2.1.2: High achievement comprehensive students compared to other achievement comprehensive students on Mathematics achievement. The findings indicate that the high achieving students in the comprehensive schools performed significantly better than their other achievement level counterparts in Mathematics at Time 1 and Time 2; however, they showed no significant growth over time. That is, over and above the significant difference found at Time 1, high achieving comprehensive students did not make any further gains in Mathematics compared to their other achievement level peers. Hence, Hypothesis 2.1.2 was partially supported.

Table 7.2

Comparison of Mathematics Achievement Outcomes across High Achieving Comprehensive and Other Achievement Comprehensive Student Groups

	Mathematics Achievement T1	Mathematics Achievement T2		
HAC vs. OAC	β	β		
Total Effects	-.437***	-.370***		
Change Over Time	-	.019		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
719.19	223	.96	.96	.04

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2. High achievement comprehensive students were coded -1 and other achievement comprehensive students were coded +1.

*** $p < .001$

Spelling Achievement

Results for Research Question 2.1.3: Selective compared to high achievement comprehensive students on Spelling achievement. Research Question 2.1.3 asked whether high achieving selective students and high achieving comprehensive students differed significantly on Spelling achievement at Time 1 or Time 2, in terms of total effects and change over time. A longitudinal SEM with a comparison between the groups on Time 1 and Time 2 Spelling achievement scores was conducted. Table 7.3 presents the results of the SEM, showing significant total effects at both testing points. Specifically, controlling for variances in SES and cultural background, selective students achieved significantly higher scores in Spelling compared to the high achieving comprehensive students at both time waves. In assessing change over time, when previous Spelling achievement at Time 1 was also accounted for, the selective students made significant improvements in Spelling at Time 2 over and above their results at Time 1, compared to the high achieving comprehensive students. In addition, the effect sizes for these results indicate that attendance at a selective school accounted for a substantial amount of variance in higher Spelling achievement scores (Cohen, 1988).

Conclusions for Research Question 2.1.3: Selective compared to high achievement comprehensive students on Spelling achievement. In response to Research Question 2.1.3, the results demonstrated that not only did selective students perform significantly better in Spelling initially, but they also achieved significant growth over time, compared to the high achieving comprehensive students.

Table 7.3

Comparison of Spelling Achievement Outcomes across Selective and High Achieving Comprehensive Student Groups

	Spelling Achievement T1	Spelling Achievement T2		
Selective vs. HAC	β	β		
Total Effects	-.484***	-.508***		
Change Over Time	-	-.200***		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
159.81	112	.99	.98	.02

Note. HAC = high achievement comprehensive; T1 = Time 1; T2 = Time 2. Selective students were coded -1 and high achieving comprehensive students were coded +1.

*** $p < .001$

Results for Hypothesis 2.1.4: High achievement comprehensive students compared to other achievement comprehensive students on Spelling achievement. Hypothesis 2.1.4 predicted that the high achieving comprehensive students would perform significantly better in Spelling than the other achieving comprehensive students, in terms of total effects and change over time. In order to test the hypothesis, a longitudinal SEM with a comparison between the groups on Spelling achievement scores was performed. Referring to Table 7.4, the results demonstrated significant total effects at both time testing points. That is, holding constant the covariates of SES and cultural background, the high achieving comprehensive students had significantly higher Spelling performance scores than their lower achievement level counterparts at both time points. The effect sizes for the total effects were both substantial in size, suggesting that being a high achieving student in a comprehensive school explained a sizeable amount of variance in Spelling achievement. Additionally, controlling for the said covariates and also for prior Spelling achievement, the high achieving comprehensive students continued to significantly improve in Spelling over time, compared to their other achievement level counterparts. While this effect was small, it should be noted that the results were significant, even after controlling for prior achievement levels.

Conclusions for Hypothesis 2.1.4: High achievement comprehensive students compared to other achievement comprehensive students on Spelling achievement. The findings from the SEM conducted to test Hypothesis 2.1.4 show that high achieving students in the comprehensive schools performed significantly

better than their other achievement peers in Spelling, and demonstrated significant growth over time. Hence, Hypothesis 2.1.4 was supported.

Table 7.4

Comparison of Spelling Achievement Outcomes across High Achieving Comprehensive and Other Achievement Comprehensive Student Groups

	Spelling Achievement T1	Spelling Achievement T2		
HAC vs. OAC	β	β		
Total Effects	-.445***	-.401***		
Change Over Time	-	-.069**		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
203.97	112	.99	.99	.02

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2. High achievement comprehensive students were coded -1 and other achievement comprehensive students were coded +1.

*** $p < .001$, ** $p < .01$

Sentence Comprehension Achievement

Results for Research Question 2.1.5: Selective compared to high achievement comprehensive students on Sentence Comprehension achievement.

Research Question 2.1.5 asked whether differing educational settings (selective or comprehensive) impacted differentially on the Sentence Comprehension achievement of their high achieving students across time in relation to Time 1 and Time 2 total effects, and change over time. A longitudinal SEM comparing the Time 1 and Time 2 Sentence Comprehension achievement scores of the two groups of students was performed. As can be seen from Table 7.5, significant total effects were found at both testing points. That is, holding SES and cultural background constant, selective students were significantly higher in Sentence Comprehension achievement compared to high achieving comprehensive students at Time 1 and Time 2. The effect sizes for both total effects were moderate to large (Cohen, 1988), indicating that the selective environment accounted for a substantial amount of variance in Sentence achievement levels. However, when SES, cultural background, and prior Sentence Comprehension achievement were controlled for, the selective students did not make significant gains in Sentence Comprehension achievement at Time 2 compared to the high achieving comprehensive students.

Table 7.5

Comparison of Sentence Comprehension Achievement Outcomes across Selective and High Achieving Comprehensive Student Groups

	Sentence Comprehension Achievement T1	Sentence Comprehension Achievement T2		
Selective vs. HAC	β	β		
Total Effects	-.596***	-.328***		
Change Over Time	-	-.005		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
159.62	112	.99	.99	.02

Note. HAC = high achievement comprehensive; T1 = Time 1; T2 = Time 2. Selective students were coded -1 and high achieving comprehensive students were coded +1.

*** $p < .001$

Conclusions for Research Question 2.1.5: Selective compared to high achievement comprehensive students on Sentence Comprehension achievement.

The results of the SEM conducted to answer Research Question 2.1.5 show that whilst the academically selective students performed significantly better in Sentence Comprehension than did the high achieving comprehensive students initially, and although they sustained this edge, they did not continue to make significant gains over time, as they did in Mathematics and Spelling.

Results for Hypothesis 2.1.6: High achievement comprehensive students compared to other achievement comprehensive students on Sentence Comprehension achievement. Hypothesis 2.1.6 predicted that the high achieving comprehensive students would attain significantly higher achievement in Sentence Comprehension than would the other achieving comprehensive students with relation to total effects and change over time. In order to test the hypothesis, a longitudinal SEM was performed with a group comparison on Sentence Comprehension scores. As can be seen in Table 7.6, the results of the SEM show significant total effects at Time 1 and Time 2. That is, controlling for differences in SES and cultural background, the high achieving comprehensive students performed significantly better in Sentence Comprehension at Time 1 and Time 2 than did students of other achievement levels within the comprehensive schools. The moderate to large effect sizes for the total effects show that the difference between the two comprehensive achievement groups was of practical importance (Cohen, 1998). However, in testing for change over time, when prior Sentence Comprehension achievement at Time 1 is

also accounted for within the model, the high achieving comprehensive students did not show any significant growth compared to their other achievement level peers.

Table 7.6

Comparison of Sentence Comprehension Achievement Outcomes across High Achieving Comprehensive and Other Achievement Comprehensive Student Groups

	Sentence Comprehension Achievement T1	Sentence Comprehension Achievement T2		
HAC vs. OAC	β	β		
Total Effects	-.437***	-.338***		
Change Over Time	-	.008		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
189.41	112	1.00	.99	.02

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2. High achievement comprehensive students were coded -1 and other achievement comprehensive students were coded +1.

*** $p < .001$

Conclusions for Hypothesis 2.1.6: High achievement comprehensive students compared to other achievement comprehensive students on Sentence Comprehension achievement. The results show that compared with other achievement level students within the same school setting, high achieving comprehensive students performed better in Sentence Comprehension at both time points. However, they did not show significant growth over time in this academic domain. As such, Hypothesis 2.1.6 was partially supported.

The Impact of Different Educational Settings on Psychosocial Wellbeing Outcomes

Mathematics Self-Concept

Results for Hypothesis 2.2.1: Selective compared to high achievement comprehensive students on Mathematics self-concept. Hypothesis 2.2.1 predicted that the high achieving selective students would possess significantly lower Mathematics self-concepts than high achieving students educated within a comprehensive school setting at both time points, controlling for SES, cultural heritage, and achievement. Left as a research question was the change over time analysis, assessing whether controlling for prior self-concept, the selective students' Mathematics self-concepts would decline significantly across the school year in

comparison to high achieving comprehensive students. In order to test this prediction, a longitudinal SEM was carried out with a group comparison on Mathematics scores specifying total effects and change over time.

Referring to the results displayed in Table 7.7, the significant total effects showed that selective students reported significantly lower Mathematics self-concepts than their high achieving counterparts in comprehensive schools, controlling for the covariates of SES, cultural background, and prior Mathematics achievement. In addition to this, change over time analyses found that when prior Mathematics self-concept was also controlled for, the Mathematics self-concepts of the high achieving students significantly improved from Time 1 to Time 2, compared to the selective students. The moderate effect sizes indicate that even after controlling for SES, culture, prior achievement, and prior self-concept, the educational setting in which high achieving students are located accounts for an important amount of variance in Mathematics self-concept (Cohen, 1988).

Table 7.7

Comparison of Mathematics Self-Concept across Selective and High Achieving Comprehensive Student Groups

	Mathematics Self- Concept T1	Mathematics Self- Concept T2		
Selective vs. HAC	β	β		
Total Effects	.270***	.349***		
Change Over Time	-	.152***		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
1756.23	549	.89	.88	.06

Note. HAC = high achievement comprehensive; T1 = Time 1; T2 = Time 2. Selective students were coded -1 and high achieving comprehensive students were coded +1.

*** $p < .001$

Conclusions for Hypothesis 2.2.1: Selective compared to high achievement comprehensive students on Mathematics self-concept. As predicted by Hypothesis 2.2.1, the high achieving selective students possessed significantly lower Mathematics self-concepts than the high achieving comprehensive students at both testing points. As such, Hypothesis 2.2.1 was supported. In answer to the research question, the comprehensive school high achievers' self-concepts significantly improved over time, compared to their selective school peers.

Results for Research Question 2.2.2: High achievement comprehensive students compared to other achievement comprehensive students on Mathematics self-concept. Research Question 2.2.2 asked whether the high achieving comprehensive students would differ significantly in terms of their Mathematics self-concepts with regard to total effects and change over time, when compared to students of other achievement levels within the same educational setting. A longitudinal SEM with a comparison between the two groups of interest was performed, to ascertain any significant differences. Table 7.8 displays the results of the group comparison, and shows no significant total effects or change over time results when SES, culture, prior Mathematics achievement, and prior Mathematics self-concept, were held equal. Essentially, comprehensive students did not differ significantly in terms of the self-perceptions they held in Mathematics, regardless of whether they were classified as high or other achievement, and this result did not change over time.

Table 7.8

Comparison of Mathematics Self-Concept across High Achieving Comprehensive and Other Achievement Comprehensive Student Groups

	Mathematics Self- Concept T1	Mathematics Self- Concept T2		
HAC vs. OAC	β	β		
Total Effects	.001	.008		
Change Over Time	-	.008		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
2111.53	549	.94	.94	.04

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2. High achievement comprehensive students were coded -1 and other achievement comprehensive students were coded +1.

Conclusions for Research Question 2.2.2: High achievement comprehensive students compared to other achievement comprehensive students on Mathematics self-concept. The findings emanating from the SEM conducted to answer Research Question 2.2.2 showed that high achieving comprehensive students held similar Mathematics self-concepts to their other achievement level peers at both time testing points. This result did not change over time.

English Self-Concept

Results for Hypothesis 2.2.3: Selective compared to high achievement comprehensive students on English self-concept. Hypothesis 2.2.3 predicted that the high achieving selective students would possess significantly lower English self-concepts than high achieving students educated within a comprehensive school setting at both time points, controlling for SES, cultural heritage and achievement. Left as a research question was the change over time analysis, assessing whether, controlling for prior self-concept, the selective students' English self-concepts would significantly decline across the school year, compared to the high achieving comprehensive students. In order to test the hypothesis, a comparison between the two groups was carried out using longitudinal SEM analyses.

Table 7.9 presents the SEM results, and shows significant total effects with small to moderate effect sizes (Cohen, 1988). Specifically, controlling for any differences in SES, culture, and prior English achievement, selective students possessed significantly lower English self-concepts than did high achieving selective students within the comprehensive schools at both Time 1 and Time 2. Hence, being in a selective educational environment explained a practical amount of variance in high achievers reporting lowered self-perceptions in English. When prior English self-concept was also controlled for at Time 2 to assess change over time, the high achieving comprehensive students did not make significant gains in their English self-concept levels at Time 2 over their selective school peers.

Table 7.9

Comparison of English Self-Concept across Selective and High Achieving Comprehensive Student Groups

	English Self-Concept T1	English Self-Concept T2		
Selective vs. HAC	β	β		
Total Effects	.143***	.164***		
Change Over Time	-	.058		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
1489.34	842	.95	.95	.03

Note. HAC = high achievement comprehensive; T1 = Time 1; T2 = Time 2. Selective students were coded as -1 and high achieving comprehensive students were coded as +1.

*** $p < .001$; ** $p < .01$

Conclusions for Hypothesis 2.2.3: Selective compared to high achievement comprehensive students on English self-concept. As hypothesised, the selective students possessed significantly lower English self-concepts than did their high achieving comprehensive counterparts at Time 1, and this difference was maintained at Time 2. Hypothesis 2.2.3 therefore was supported. In answer to the research question, change over time analyses indicate that the comprehensive setting high achievers made no further gains in English self-concept at Time 2 over the selective high achievers.

Results for Research Question 2.2.4: High achievement comprehensive students compared to other achievement comprehensive students on English self-concept. Research Question 2.2.4 asked whether comprehensive students of high achievement and other achievement levels would differ significantly with regard to their self-perceptions in English at Time 1 or Time 2, in relation to total effects and change over time. In order to address this question, a longitudinal SEM with a comparison between groups was carried out to determine any significant total or change over time effects. With reference to Table 7.10, when SES, cultural background, and prior English achievement were held constant, high achieving comprehensive students and other achievement comprehensive students held similar self-concepts in English at both time points. In addition, when Time 1 English self-concept was controlled for, in addition to the aforementioned variables, this situation was maintained at Time 2.

Table 7.10

Comparison of English Self-Concept across High Achieving Comprehensive and Other Achievement Comprehensive Student Groups

	English Self-Concept T1	English Self-Concept T2		
HAC vs. OAC	β	β		
Total Effects	-.039	-.041		
Change Over Time	-	-.002		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
1866.01	842	.97	.97	.03

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2. High achievement comprehensive students were coded -1 and other achievement comprehensive students were coded +1.

*** $p < .001$

Conclusions for Research Question 2.2.4: High achievement

comprehensive students compared to other achievement comprehensive students on English self-concept. In response to Research Question 2.2.4, it was found that high or other achievement comprehensive students did not differ significantly in terms of their English self-concepts; this result remained unchanged over time.

General School Self-Concept

Results for Hypothesis 2.2.5: Selective compared to high achievement comprehensive students on General School self-concept. Hypothesis 2.2.5 predicted that high achieving selective students would possess significantly lower General School self-concepts than high achieving students educated within a comprehensive school setting, at both time points, controlling for SES, cultural heritage, and achievement. Left as a research question was the change over time analysis that assessed whether, controlling for prior self-concept, the selective students' General School self-concepts would significantly decline across the school year in comparison to the high achieving comprehensive students. A longitudinal SEM specifying a comparison between the school groups was performed.

Referring to Table 7.11, the results demonstrate that the two total effects tested were statistically significant. Essentially, controlling for the covariates of SES, cultural background, and Time 1 Mathematics and English academic achievement, selective students reported significantly lower self-perceptions of their general schooling abilities than did the comprehensive school group of high achievers at both testing points. The beta paths indicate that the significant total effects had small to moderate effect sizes (Cohen, 1988). In terms of change over time, when the influence of prior differences in General School self-concept at Time 1 was removed, the comprehensive school high achievers did not make any significant gains in self-concept over and above those found at Time 1, compared to the selective students.

Conclusions for Hypothesis 2.2.5: Selective compared to high achievement comprehensive students on General School self-concept. Significant total effects indicated that the high achieving comprehensive students had higher General School self-concepts than did the selective students at Time 1 and Time 2. As such, Hypothesis 2.2.5 was supported. Change over time analysis showed that this difference remained the same over time, with no further gains in General School self-concept made.

Table 7.11

Comparison of General School Self-Concept across Selective and High Achieving Comprehensive Student Groups

	General School Self- Concept T1	General School Self- Concept T2		
Selective vs. HAC	β	β		
Total Effects	.139***	.207***		
Change Over Time	-	.059		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
1414.89	543	.91	.90	.05

Note. HAC = high achievement comprehensive; T1 = Time 1; T2 = Time 2. Selective students were coded -1 and high achieving comprehensive students were coded +1.

*** $p < .001$

Results for Research Question 2.2.6: High achievement comprehensive students compared to other achievement comprehensive students on General School self-concept. Research Question 2.2.6 posed whether high achieving comprehensive students would differ significantly from other achievement comprehensive students in terms of their General School self-perceptions at Time 1 and Time 2, measured as total effects and as change over time. In order to uncover any significant effects, a longitudinal SEM with a group comparison was carried out. As can be seen in Table 7.12, only one significant total effect was noted. Holding constant SES, culture, and prior Mathematics and English achievement, high achieving comprehensive students had significantly lower General School self-concepts than other achievement comprehensive students at Time 1. The effect size for this difference was, however, small. By Time 2, no significant difference was found between the two comprehensive school groups.

Conclusions for Research Question 2.2.6: High achievement comprehensive students compared to other achievement comprehensive students on General School self-concept. In answer to Research Question 2.2.6, a small significant total effect was found for Time 1, in that high achievers within the comprehensive setting held lower General School self-perceptions than their other achievement level counterparts. Over time, this difference was not maintained and the two comprehensive groups reported similar levels of General School self-concept at Time 2.

Table 7.12

Comparison of General School Self-Concept across High Achieving Comprehensive and Other Achievement Comprehensive Student Groups

	General School Self- Concept T1	General School Self- Concept T2		
HAC vs. OAC	β	β		
Total Effects	-.085**	-.061		
Change Over Time	-	-.006		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
2119.72	543	.94	.93	.04

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2. High achievement comprehensive students were coded as -1 and other achievement comprehensive students were coded as +1.

** $p < .01$

Mathematics Academic Buoyancy

Results for Research Question 2.2.7: Selective compared to high achievement comprehensive students on Mathematics academic buoyancy.

Research Question 2.2.7 asked whether attending a selective or a comprehensive school would have a differential effect on high achieving students' buoyancy in Mathematics across two time waves, with regard to total effects and change over time. In order to uncover any significant effects, a comparison between the groups on Time 1 and Time 2 Mathematics buoyancy scores was conducted, using a longitudinal SEM analysis. Table 7.13 shows that the selective and high achieving comprehensive students were equally resilient in Mathematics at Time 1 and Time 2, controlling for SES, cultural background, and prior Mathematics achievement. Moreover, this lack of significant difference was maintained across time, when prior Mathematics resiliency levels were also held equal.

Conclusions for Research Question 2.2.7: Selective compared to high achievement comprehensive students on Mathematics academic buoyancy. In investigating Research Question 2.2.7, the findings showed that the diverse educational settings of selective and comprehensive schools did not differentially impact upon the Mathematics buoyancy of their high achieving students over time. The high achieving students reported similar levels of Mathematics buoyancy throughout the school year, irrespective of their educational setting.

Table 7.13

Comparison of Mathematics Buoyancy across Selective and High Achieving Comprehensive Student Groups

	Mathematics Buoyancy T1	Mathematics Buoyancy T2		
Selective vs. HAC	β	β		
Total Effects	.038	.105		
Change Over Time	-	.078		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
1461.87	484	.88	.87	.05

Note. HAC = high achievement comprehensive; T1 = Time 1; T2 = Time 2. Selective students were coded -1 and high achieving comprehensive students were coded +1.

Results for Research Question 2.2.8: High achievement comprehensive students compared to other achievement comprehensive students on

Mathematics academic buoyancy. Research Question 2.2.8 asked whether there were any significant differences between comprehensive school students of a high achievement level and those of other achievement levels in relation to Time 1 and Time 2 total effects, and change across time. The results of the longitudinal SEM specifying a between-group comparison on the Time 1 and Time 2 Mathematics resiliency constructs are presented in Table 7.14. As can be seen, controlling for SES, cultural background, and prior Mathematics achievement, there were no significant differences between the two groups in Mathematics academic buoyancy at Time 1. Moreover, this situation was maintained at Time 2 when Time 1 Mathematics buoyancy also was controlled for.

Conclusions for Research Question 2.2.8: High achievement comprehensive students compared to other achievement comprehensive students on Mathematics academic buoyancy. In investigating Research Question 2.2.8, the findings showed that high achieving comprehensive students and their lower achievement counterparts possessed similar levels of academic buoyancy in Mathematics, both initially and over time.

Table 7.14

Comparison of Mathematics Buoyancy across High Achieving Comprehensive and Other Achievement Comprehensive Student Groups

	Mathematics Buoyancy T1	Mathematics Buoyancy T2		
HAC vs. OAC	β	β		
Total Effects	-.016	-.013		
Change Over Time		-.003		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
1823.08	484	.93	.92	.04

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2. High achievement comprehensive students were coded -1 and other achievement comprehensive students were coded +1.

English Academic Buoyancy

Results for Research Question 2.2.9: Selective compared to high achievement comprehensive students on English academic buoyancy. Research Question 2.2.9 posed whether there were any significant total effects or change over time differences between selective school students and their high achieving counterparts within the comprehensive schools in relation to their English buoyancy at Time 1 and Time 2. A comparison between the groups on their Time 1 and Time 2 English buoyancy scores was performed via a longitudinal SEM, in order to answer this research question. The findings are presented in Table 7.15, and show that after holding constant any differences in SES, cultural background, and prior English achievement, high achieving students possessed similar levels of buoyancy in English at Time 1 and Time 2, irrespective of their educational setting. Moreover, controlling for Time 1 English buoyancy in addition to the covariates listed above, this finding remained the same over time.

Conclusions for Research Question 2.2.9: Selective compared to high achievement comprehensive students on English academic buoyancy. In answer to Research Question 2.2.9, the data indicate that there were no significant differences between high achievers located within the selective and comprehensive settings in terms of their English buoyancy, both initially and over time.

Table 7.15

Comparison of English Buoyancy across Selective and High Achieving Comprehensive Student Groups

	English Buoyancy T1	English Buoyancy T2		
Selective vs. HAC	β	β		
Total Effects	.035	.011		
Change Over Time		-.011		
Goodness-of-Fit Indices				
χ^2	Df	CFI	TLI	RMSEA
899.00	311	.93	.92	.05

Note. HAC = high achievement comprehensive; T1 = Time 1; T2 = Time 2. Selective students were coded -1 and high achieving comprehensive students were coded +1.

Results for Research Question 2.2.10: High achievement comprehensive students compared to other achievement comprehensive students on English buoyancy. Research Question 2.2.10 asked whether students of a high achievement level and a lower achievement level located within the comprehensive school setting were similar or different in terms of their English buoyancy at Time 1 or Time 2 in terms of total effects or change over time. The results emanating from the SEM and group contrast comparing Time 1 and Time 2 English buoyancy scores, are shown in Table 7.16. No significant total or change over time effects were found after controlling for the covariates of SES, cultural background, prior English achievement, and prior English buoyancy. Specifically, high achieving and lower achieving comprehensive students were similar in their English buoyancy, both initially and over time.

Table 7.16

Comparison of English Buoyancy across High Achieving Comprehensive and Other Achievement Comprehensive Student Groups

	English Buoyancy T1	English Buoyancy T2		
HAC vs. OAC	β	β		
Total Effects	-.054	-.015		
Change Over Time		.016		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
1233.76	311	.96	.95	.04

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2. High achievement comprehensive students were coded -1 and other achievement comprehensive students were coded +1.

Conclusions for Research Question 2.2.10: High achievement

comprehensive students compared to other achievement comprehensive students on English academic buoyancy. In answer to Research Question 2.2.10, it was found that comprehensive school high achievers and their other achievement counterparts did not differ significantly in the level of buoyancy they reported in English in terms of total effects and change over time.

Parental Relations Self-Concept

Results for Research Question 2.2.11: Selective compared to high achievement comprehensive students on Parental Relations self-concept.

Research Question 2.2.11 asked whether high achieving students located within the selective and comprehensive settings would possess similar or different Parental Relations self-concepts at Time 1 and Time 2, measured as total effects and as change over time. The results of the group comparison SEM are presented in Table 7.17, and show that the two total effects tested were statistically significant. That is, controlling for SES and cultural background, the academically selective school students reported significantly lower Parental Relations self-concepts than did their high achieving peers within the comprehensive schools. The effect sizes indicated that being in a selective school setting accounted for a moderate amount of variance in students' lowered perceptions of their relationships with parents (Cohen, 1988). In evaluating change over time, the data showed that when prior self-concept differences at Time 1 were controlled for at Time 2, the high achieving comprehensive students made no further gains in Parental Relations self-concept over their selective peers.

Conclusions for Research Question 2.2.11: Selective compared to high achievement comprehensive students on Parental Relations self-concept. In response to Research Question 2.2.11, it was found that high achieving comprehensive students possessed significantly better relationships with their parents than did their selective school counterparts at both time points; however, this difference did not increase significantly over time.

Table 7.17

Comparison of Parental Relations Self-Concept across Selective and High Achieving Comprehensive Student Groups

	Parental Relations Self-Concept T1	Parental Relations Self-Concept T2		
Selective vs. HAC	β	β		
Total Effects	.154***	.129**		
Change Over Time		.007		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
83.00	36	.99	.99	.04

Note. HAC = high achievement comprehensive; T1 = Time 1; T2 = Time 2. Selective students were coded -1 and high achieving comprehensive students were coded +1.

*** $p < .001$, ** $p < .01$

Results for Research Question 2.2.12: High achievement comprehensive students compared to other achievement comprehensive students on Parental Relations self-concept. Research Question 2.2.12 posed whether high achieving and other achieving comprehensive students would report similar or different relationships with their parents, in terms of total effects and change over time. The findings from the SEM conducted to compare the Time 1 and Time 2 Parental Relations self-concept scores are displayed in Table 7.18. As can be seen, holding constant the covariates of SES and cultural background, high achieving comprehensive students and their other achievement peers did not differ significantly in their relationships with parents at Time 1. Controlling for SES, culture, and previous levels of Parental Relations self-concept, this situation remained unchanged at Time 2.

Conclusions for Research Question 2.2.12: High achievement comprehensive students compared to other achievement comprehensive students on Parental Relations self-concept. The data indicate that high achieving comprehensive students had similar parental relationships to lower achieving comprehensive students; these relations did not change over time.

Table 7.18

Comparison of Parental Relations Self-Concept across High Achieving Comprehensive and Other Achievement Comprehensive Student Groups

	Parental Relations Self-Concept T1		Parental Relations Self-Concept T2		
HAC vs. OAC	β		β		
Total Effects	-.020		-.020		
Change Over Time			-.005		
Goodness-of-Fit Indices					
	χ^2	df	CFI	TLI	RMSEA
	120.54	36	.99	.98	.04

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2. High achievement comprehensive students were coded -1 and other achievement comprehensive students were coded +1.

Parental Pressure to Achieve

Results for Research Question 2.2.13: Selective compared to high achievement comprehensive students on Parental pressure to achieve. Research Question 2.2.13 asked whether the educational setting in which high achieving students were situated (selective or comprehensive) differentially affected the pressure they received from their parents to do well academically at Time 1 and Time 2, in regard to total effects and change over time. A longitudinal SEM comparing the two school settings was conducted on the Parental pressure to achieve scores. Referring to Table 7.19, no significant total effects or change over time effects were noted. Controlling for SES, culture, and prior Mathematics and English achievement, selective and high achieving comprehensive students reported similar levels of pressure to achieve from their parents at Time 1. This situation remained the same at Time 2, after additionally controlling for Time 1 Parental pressure. However, an important caveat must be made with regard to Parental pressure. The highest score that could be reported on this construct was six, and the average level of parental pressure reported by each student achievement group was above five for each time wave. As such, all students reported similarly high levels of pressure to achieve from their parents, irrespective of schooling environment.

Conclusions for Research Question 2.2.13: Selective compared to high achievement comprehensive students on Parental pressure to achieve. The findings indicate that the educational settings in which high academic achievers were located (selective or comprehensive) did not differentially impact on the pressure to

achieve they felt from their parents, both initially and over time. Both groups reported experiencing similarly high levels of pressure.

Table 7.19

Comparison of Parental Pressure to Achieve across Selective and High Achieving Comprehensive Student Groups

	Parental Pressure T1	Parental Pressure T2		
Selective vs. HAC	β	β		
Total Effects	.015	-.044		
Change Over Time		-.054		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
1604.86	543	.86	.85	.05

Note. HAC = high achievement comprehensive; T1 = Time 1; T2 = Time 2. Selective students were coded -1 and high achieving comprehensive students were coded +1.

Results for Research Question 2.2.14: High achievement comprehensive students compared to other achievement comprehensive students on Parental pressure to achieve. Research Question 2.1.14 asked whether comprehensive school high achievers differed to their lower achievement peers within the same educational setting in terms of the pressure they received from their parents to achieve well at school, measured as total effects and change across time. A longitudinal SEM assessed the Time 1 and Time 2 Parental pressure to achieve data; the findings are displayed in Table 7.20. Controlling for SES, cultural background, and Time 1 Mathematics and English achievement, the high achieving comprehensive students did not differ significantly from the other achievement comprehensive students in the levels of pressure they reported from their parents at Time 1. This result remained unchanged across time with Time 1 Parental pressure also accounted for. As stated previously, all students reported similarly high levels of pressure to achieve from their parents, regardless of their educational environment or academic achievement level.

Conclusions for Research Question 2.2.14: High achievement comprehensive students compared to other achievement comprehensive students on Parental pressure to achieve. The findings generated to answer Research Question 2.2.14 demonstrated that high achieving comprehensive students

and their other achievement counterparts reported similarly high levels of pressure to achieve from their parents across the school year.

Table 7.20

Comparison of Parental Pressure to Achieve across High Achieving Comprehensive and Other Achievement Comprehensive Student Groups

	Parental Pressure T1	Parental Pressure T2		
HAC vs. OAC	β	β		
Total Effects	.017	.063		
Change Over Time		.052		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
2251.88	543	.93	.92	.05

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2. High achievement comprehensive students were coded -1 and other achievement comprehensive students were coded +1.

Teacher Pressure to Achieve

Results for Research Question 2.2.15: Selective compared to high achievement comprehensive students on Teacher pressure to achieve. Research Question 2.2.15 asked whether there were any significant total effects or change over time differences between high achieving selective students and high achieving comprehensive students in relation to the pressure received from teachers at Time 1 or Time 2, with regard to total effects and change over time. To answer this question, a longitudinal SEM was performed comparing the groups on Time 1 and Time 2 Teacher pressure to achieve scores. As can be seen in Table 7.21, after holding constant the covariates of SES, culture, prior Mathematics and English achievement, and prior pressure, there were no significant differences between the selective and comprehensive high achieving students in teacher pressure at either time point.

Conclusions for Research Question 2.2.15: Selective compared to high achievement comprehensive students on Teacher pressure to achieve. The SEM conducted to address Research Question 2.2.15 indicated that selective students and high achieving selective students reported similar levels of pressure to achieve academically from their teachers throughout the school year.

Table 7.21

Comparison of Teacher Pressure to Achieve across Selective and High Achieving Comprehensive Student Groups

	Teacher Pressure T1	Teacher Pressure T2		
Selective vs. HAC	β	β		
Total Effects	-.047	-.034		
Change Over Time		-.007		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
1474.55	543	.86	.85	.05

Note. HAC = high achievement comprehensive; T1 = Time 1; T2 = Time 2. Selective students were coded -1 and high achieving comprehensive students were coded +1.

Results for Research Question 2.2.16: High achievement comprehensive students compared to other achievement comprehensive students on Teacher pressure to achieve. Research Question 2.1.16 posed whether there were any significant differences between high achieving comprehensive students and other achievement level comprehensive students in pressure received from teachers at Time 1 or Time 2, with regard to total effects and change over time. A longitudinal SEM comparing the groups on Time 1 and Time 2 Teacher pressure scores was performed, to answer this question. Table 7.22 shows that no significant total effects or change over time effects were found. That is, all students within the comprehensive setting, regardless of their achievement level, reported experiencing similar levels of pressure to achieve from their teachers, both initially and across time, after the variables of SES, culture, Time 1 Mathematics and English achievement, and Time 1 Teacher pressure were controlled for.

Conclusions for Research Question 2.2.16: High achievement comprehensive students compared to other achievement comprehensive students on Teacher pressure to achieve. The findings generated to answer Research Question 2.2.16 show that the high achieving comprehensive students did not differ significantly from the students of a lowered achievement level within the comprehensive setting, on reported pressure to achieve from teachers at the beginning of the school year, and over time.

Table 7.22

Comparison of Teacher Pressure to Achieve across High Achieving Comprehensive and Other Achievement Comprehensive Student Groups

	Teacher Pressure T1		Teacher Pressure T2		
HAC vs. OAC	β		β		
Total Effects	-.038		.022		
Change Over Time			.044		
Goodness-of-Fit Indices					
	χ^2	df	CFI	TLI	RMSEA
	2201.36	543	.93	.92	.04

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2. High achievement comprehensive students were coded -1 and other achievement comprehensive students were coded +1.

Depression

Results for Research Question 2.2.17: Selective compared to high achievement comprehensive students on Depression. Research Question 2.2.17 asked whether the educational settings (selective or comprehensive) in which high achieving students are educated have a differential impact on their depressive tendencies measured as total effects and as change over time at two points during the school year. An SEM compared the Depression scores of the two groups of interest across time to answer the research question. Table 7.23 presents the outcome of the SEM. It was evident that, controlling for SES and cultural background, there were no significant differences between the selective students and the high achieving comprehensive students at either time point. However, controlling for SES, culture, and depression levels at Time 1, between Time 1 and Time 2 the selective students became more depressed than the high achieving comprehensive students. It must be noted that the effect size for this finding was small, thus diminishing the practical importance of this difference.

Conclusions for Research Question 2.2.17: Selective compared to high achievement comprehensive students on Depression. The SEM findings indicate that high achieving students located within the selective educational setting were no more depressed on average than their high achieving peers located within the comprehensive educational setting, throughout the school year.

Table 7.23

Comparison of Depressive Tendencies across Selective and High Achieving Comprehensive Student Groups

	Depression T1	Depression T2		
Selective vs. HAC	β	β		
Total Effects	.016	-.076		
Change Over Time		-.086*		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
380.35	111	.95	.94	.06

Note. HAC = high achievement comprehensive; T1 = Time 1; T2 = Time 2. Selective students were coded -1 and high achieving comprehensive students were coded +1.

* $p < .05$

Results for Research Question 2.2.18: High achievement comprehensive students compared to other achievement comprehensive students on Depression.

Research Question 2.1.18 asked whether levels of reported depressive tendencies would differ between high achieving comprehensive students and other achievement comprehensive students, with regard to total effects and change over time. In order to address this question, the groups were compared on their Time 1 and Time 2 Depression scores, using SEM analysis. Referring to Table 7.24, it can be seen that controlling for SES and culture, there was no significant difference in Depression between these two groups at Time 1. Furthermore, controlling for previous depressive tendency scores at Time 1 in addition to the abovementioned covariates, this finding did not change at Time 2.

Table 7.24

Comparison of Depressive Tendencies across High Achieving Comprehensive and Other Achievement Comprehensive Student Groups

	Depression T1	Depression T2		
HAC vs. OAC	β	β		
Total Effects	.037	.044		
Change Over Time		.023		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
635.63	111	.95	.94	.06

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2. High achievement comprehensive students were coded -1 and other achievement comprehensive students were coded +1.

Conclusions for Research Question 2.2.18: High achievement

comprehensive students compared to other achievement comprehensive students Depression. In response to Research Question 2.2.18, high achieving comprehensive students were, on average, no more depressed than the other achievement comprehensive students: initially and over time.

Anxiety

Results for Research Question 2.2.19: Selective compared to high achievement comprehensive students on Anxiety. Research Question 2.1.19 asked whether high achieving selective students and high achieving comprehensive students differed significantly in terms of their levels of reported Anxiety at Time 1 or Time 2, measured as total effects and change over time. A longitudinal SEM with a comparison between the groups on Time 1 and Time 2 Anxiety scores was conducted to assess any significant differences. Table 7.25 presents the results of the SEM. Controlling for variances in SES and cultural background, high achieving comprehensive students reported significantly more anxiety than did the selective students at Time 1. The total effect for Time 2 was not significant. However, when prior levels of Time 1 Anxiety was controlled for, in addition to SES and culture at Time 2, the results were reversed, with selective students becoming significantly more anxious than the high achieving comprehensive students. The effect sizes for these findings were small to moderate (Cohen, 1988), indicating that the type of educational setting explained a reasonable amount of variance in the anxious tendencies of high achieving students.

Table 7.25

Comparison of Anxious Tendencies across Selective and High Achieving Comprehensive Student Groups

	Anxiety T1	Anxiety T2		
Selective vs. HAC	β	β		
Total Effects	.154**	-.043		
Change Over Time		-.141**		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
311.67	111	.92	.90	.05

Note. HAC = high achievement comprehensive; T1 = Time 1; T2 = Time 2. Selective students were coded -1 and high achieving comprehensive students were coded +1.

** $p < .01$

Conclusions for Research Question 2.2.19: Selective compared to high achievement comprehensive students on Anxiety. Findings emanating from the SEM analysis show that at the beginning of the school year, high achieving comprehensive students were more anxious than their selective school counterparts. However, by the end of the school year, the selective students reported more anxiety than their comprehensive high achieving peers.

Results for Research Question 2.2.20: High achievement comprehensive students compared to other achievement comprehensive students on Anxiety. Research Question 2.2.20 posed whether students of differing achievement levels in the comprehensive school setting would report similar or different levels of anxiety, measured as total effects and as change over time. Table 7.26 presents the findings from the group comparison conducted on the high achievement and other achievement comprehensive student group scores. Firstly, both total effects tested were significant, and indicated that the other achievement comprehensive students reported significantly higher levels of anxiety than their high achieving peers, after controlling for the covariates of SES and culture. In testing for change over time, by additionally controlling for prior anxiety levels, this significant difference was maintained at Time 2. However, the effect sizes indicated by the beta paths for these significant effects (Cohen, 1988) were small.

Table 7.26

Comparison of Anxious Tendencies across High Achieving Comprehensive and Other Achievement Comprehensive Student Groups

	Anxiety T1	Anxiety T2		
HAC vs. OAC	β	β		
Total Effects	.076**	.096**		
Change Over Time		.054*		
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
307.86	111	.96	.96	.03

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2. High achievement comprehensive students were coded -1 and other achievement comprehensive students were coded +1.

** $p < .01$, * $p < .05$

Conclusions for Research Question 2.2.20: High achievement comprehensive students compared to other achievement comprehensive students on Anxiety. The results show that compared with the high achieving

students in comprehensive schools, the other achievement level students within the same educational setting reported significantly higher levels of anxiety initially, and this continued to increase significantly over time. However, the effect sizes noted were small, which reduces the practical importance of the findings.

The Reciprocal Relations between Psychosocial Constructs and Academic Achievement

Mathematics Self-Concept and Achievement

Results for Hypothesis 2.3.1: The reciprocal relations between Mathematics self-concept and Mathematics achievement across student setting/achievement groups. Hypothesis 2.3.1 predicted that in accordance with the REM (Marsh & Craven, 2005; 2006), Mathematics self-concept and Mathematics achievement would share significant and positive reciprocal relations for the selective, high achievement comprehensive, and other achievement comprehensive student groups. Left as a research question was the strength of the relations and whether they were similar in size across the groups. In order to test the hypothesis and answer the research question, a multi-group SEM was conducted in which three REMs were estimated simultaneously across the groups of interest, controlling for SES and cultural background.

The results are displayed in Table 7.27. For the selective students, whilst the cross-lagged path representing the effect of prior Mathematics self-concept on subsequent Mathematics achievement did not reach significance, prior Mathematics achievement was a significantly positive predictor of subsequent Mathematics self-concept ($\beta = .101$). For the high achievement comprehensive group, the reciprocal relations between Mathematics self-concept and Mathematics achievement, although positive, did not reach significance. For the other achievement comprehensive student group, prior Mathematics self-concept was significantly and positively related to later Mathematics achievement ($\beta = .127$), and prior Mathematics achievement was significantly positively related to subsequent Mathematics self-concept ($\beta = .128$). The autoregressive (stability) effects were also large and significant for self-concept (average $\beta = .738$) and especially for achievement (average $\beta = .802$). In considering effect size, these very high stability coefficients are critical, because they establish that self-concept and, particularly, achievement,

are so stable across time that any further predictors of these constructs cannot be very large.

Table 7.27

Beta Paths and Significance Values for the Reciprocal Relations between Mathematics Self-Concept and Mathematics Achievement

		Mathematics Achievement T2		
		Selective	HAC	OAC
		β	β	β
Mathematics Self-Concept T1		.076	.083	.127***
		Mathematics Self-Concept T2		
		Selective	HAC	OAC
		β	β	β
Mathematics Achievement T1		.101*	.097	.128***
Goodness-of-Fit Indices				
χ^2	<i>df</i>	CFI	TLI	RMSEA
4147.09	1653	.91	.91	.05

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2.

*** $p < .001$; * $p < .05$

In order to ascertain whether the size of the reciprocal paths between Mathematics self-concept and Mathematics achievement differed across the selective, high achievement comprehensive, and other achievement comprehensive groups, a Wald chi-square test of parameter equalities was run. The Wald test was non-significant ($\chi^2 = 8.36$, $df = 4$, $p = .07$), indicating that there was not sufficient evidence to say that the strength of the paths differed significantly across groups.

Conclusions for Hypothesis 2.3.1: The reciprocal relations between Mathematics self-concept and Mathematics achievement across student setting/achievement groups. Mathematics self-concept and Mathematics achievement shared significant positive reciprocal relations for the other achievement level comprehensive group only. For the selective students, prior Mathematics achievement was a significant positive predictor of subsequent Mathematics self-concept. However, the reverse relation, while positive, did not reach significance. For the other achievement comprehensive group, the cross-lagged beta paths representing the reciprocal relations between self-concept and achievement were in the predicted direction, but did not reach significance. Although not all of the predicted relations were found, the Wald test indicates that the strength of the beta

paths was statistically similar across all three groups. As such, Hypothesis 2.3.1 was partially supported.

English Self-Concept and Achievement

Results for Hypothesis 2.3.2: The reciprocal relations between English self-concept and English achievement across student setting/achievement groups.

In accordance with the REM (Marsh & Craven, 2005; 2006), Hypothesis 2.3.2 predicted that prior English self-concept would have significant positive relations with subsequent English achievement (comprising Spelling and Sentence Comprehension) and that prior achievement in English would be a significant positive predictor of later English self-concept for the selective students, high achieving comprehensive students, and other achievement comprehensive students. Left as a research question was the strength of the beta paths and whether they were similar or different across the three groups. In order to test this prediction and explore the research question, two separate REM models for Spelling and Sentence Comprehension achievement were conducted across the three setting/achievement groupings, controlling for SES and cultural background.

The results are presented in Table 7.28. For the students located in the academically selective setting, prior English self-concept did not significantly predict later Spelling achievement or vice versa, and the beta values for these relations were quite small and negative. For the high achievement comprehensive students, again the reciprocal relations between English self-concept and English achievement were non-significant; however the beta path values were stronger. For the other achievement comprehensive students, Time 1 English self-concept was significantly positively related to Time 2 English achievement (Spelling $\beta = .093$; Sentence Comprehension $\beta = .064$) and Time 1 English achievement was significantly and positively related to Time 2 English self-concept (Spelling $\beta = .068$; Sentence Comprehension $\beta = .102$). In terms of effect size, although the beta paths for these relations were small, the stability coefficients for English self-concept ($\beta = .715$), and particularly for achievement (Spelling $\beta = .879$; Sentence Comprehension $\beta = .810$) were again large and significant, indicating that further predictors of these outcomes cannot be very big.

Table 7.28

Beta Paths and Significance Values for the Reciprocal Relations between English Self-Concept and English Achievement

	Spelling T2			Sentence Comp T2		
	Select	HAC	OAC	Select	HAC	OAC
	β	β	β	β	β	β
English SC T1	.011	.083	.093***	.024	.044	.064**
English Self-Concept T2						
	Select	HAC	OAC			
	β	β	β			
Spelling T1	-.022	.094	.068**			
Sentence Comp T1	-.018	.063	.102***			
Goodness-of-Fit Indices						
	χ^2	df	CFI	TLI	RMSEA	
Spelling	2125.04	1098	.96	.96	.04	
Sentence Comp	2116.50	1098	.97	.97	.04	

Note. Sentence Comp = Sentence Comprehension; Select = selective; HAC = high achievement comprehensive; OAC = other achievement comprehensive; SC = self-concept; T1 = Time 1; T2 = Time 2.

*** $p < .001$; ** $p < .01$

To determine whether the strength of the reciprocal paths between English self-concept and English achievement differed significantly anywhere across the three groups, two Wald chi-square tests of parameter equalities were carried out for each of the Spelling and Sentence Comprehension models. The Wald tests were non-significant for Spelling ($\chi^2 = 6.76$, $df = 4$, $p = .15$) and Sentence Comprehension ($\chi^2 = 4.54$, $df = 4$, $p = .34$), indicating that there was not sufficient evidence to say that the strength of the reciprocal relations between English self-concept and English achievement was significantly different across the academic groupings.

Conclusions for Hypothesis 2.3.2: The reciprocal relations between English self-concept and English achievement across student setting/achievement groups. Prior English self-concept had a significant and positive effect on subsequent English achievement, and prior English achievement was positively related to subsequent English self-concept for the other achievement level comprehensive group only. No significant relations were found for the selective and high achievement comprehensive groups, with the beta path values for the former group being particularly low and negative. Hence, Hypothesis 2.3.2 was not supported. Whilst the predicted reciprocal relations between English self-concept and English achievement were not found for the high achieving selective and

comprehensive students, Wald tests demonstrated that the strength of the predictive paths was not statistically different across the three groups.

General School Self-Concept and Achievement

Results for Hypothesis 2.3.3: The reciprocal relations between General School self-concept and Mathematics achievement across student

setting/achievement groups. Hypothesis 2.3.3 predicted that in accordance with the REM (Marsh & Craven, 2005; 2006), prior General School self-concept would have a significantly positive relation to later achievement in Mathematics, and prior Mathematics achievement would be positively related to subsequent General School self-concept for each of the three student academic groups: selective, high achievement comprehensive, and other achievement comprehensive. Left as a research question was the strength of the beta paths, and whether they were similar or different across the three groups.

The results of the multi-group SEM models, wherein three REMs were conducted across the groups of interest, controlling for SES and cultural background, are displayed in Table 7.29. For the selective and high achievement comprehensive student groups, General School self-concept and Mathematics achievement did not share any significant reciprocal relations. For the other achievement comprehensive group, prior General School self-concept significantly positively related to later Mathematics achievement ($\beta = .061$), and prior Mathematics achievement was significantly positively related to subsequent General School self-concept ($\beta = .076$). Although the effect sizes for these relations were small, once again the large and significant stability effects for self-concept ($\beta = .702$) and particularly achievement ($\beta = .846$) were of importance, in that any additional predictors of self-concept and achievement cannot be very large.

A Wald test of parameter equalities was conducted, to ascertain whether the magnitude of the cross-lagged paths between Time 1 General School self-concept and Time 2 Mathematics achievement and Time 1 Mathematics achievement and Time 2 General School self-concept differed across the three groups. Whilst the paths were not significant for the selective or high achieving comprehensive student groups, the Wald test of parameter equalities was non-significant ($\chi^2 = 5.01$, $df = 4$, $p = .60$), indicating that the strength of the paths was not significantly different across the three groups.

Table 7.29

Beta Paths and Significance Values for the Reciprocal Relations between General School Self-Concept and Mathematics Achievement

Mathematics Achievement T2				
	Selective	HAC	OAC	
	β	β	β	
General School Self-Concept T1	.038	.028	.061*	
General School Self-Concept T2				
	Selective	HAC	OAC	
	β	β	B	
Mathematics Achievement T1	.057	.031	.076**	
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
3165.38	1275	.90	.90	.05

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2.

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

Conclusions for Hypothesis 2.3.3: The reciprocal relations between General School self-concept and Mathematics achievement across student setting/achievement groups. Contrary to predictions made, prior General School self-concept did not significantly relate to later Mathematics achievement, or vice versa, for the selective students or the high achieving comprehensive students. For the other achievement comprehensive group, prior General School self-concept was a significant predictor of subsequent Mathematics achievement, and prior achievement in Mathematics was significantly positively linked to later General School self-concept. Whilst these relations were non-significant for the high achieving students located within the selective and comprehensive settings, the Wald test demonstrated that there was not sufficient evidence to say that the strength of the paths representing these effects differed significantly across the three groups. As such, Hypothesis 2.3.3 was partially supported.

Results for Hypothesis 2.3.4: The reciprocal relations between General School self-concept and English achievement across student setting/achievement groups. In accordance with the REM (Marsh & Craven, 2005; 2006), Hypothesis 2.3.4 predicted that prior General School self-concept would have a significantly positive relation to later achievement in Spelling and Sentence Comprehension, and that prior achievement in English would significantly positively relate to subsequent General School self-concept for all students, irrespective of their school setting and

academic achievement level. Left as a research question was the strength of the beta paths and whether they were similar or different across the three groups.

The results of the multi-group SEMs conducted to answer the posed hypothesis and research question, controlling for any differences in student SES and cultural heritage, are displayed in Table 7.30. For the students located in the academically selective setting, General school self-concept and Spelling and Sentence Comprehension achievement did not share any significant reciprocal relations. Furthermore, the beta path values were predominantly small and negative. Similarly for the high achieving students located in the comprehensive school setting, prior General School self-concept was not a significant predictor of subsequent English achievement, or vice versa; however, the beta path values were in the predicted positive direction. For the other achieving students located in the comprehensive school, Time 1 General School self-concept significantly and positively predicted later achievement in Spelling ($\beta = .088$) and Sentence Comprehension achievement ($\beta = .099$), and Time 1 Spelling and Sentence Comprehension achievement were significant positive predictors of Time 2 General School self-concept ($\beta = .073$; $\beta = .114$ respectively). Although the beta paths for these significant relations were small, once again the large and significant stability effects for self-concept (mean $\beta = .721$) and achievement (mean $\beta = .853$) demonstrate that further predictors of these constructs cannot be very great.

In order to test whether the strength of the reciprocal paths between General school self-concept and English achievement differed significantly across the three groups, a Wald chi-square test of parameter equalities was run for each of the Spelling and Sentence Comprehension models. In regard to Spelling, the Wald test was non-significant ($\chi^2 = 10.56$, $df = 4$, $p = .126$), signifying that there was not sufficient evidence to indicate that the strength of the paths were significantly different across the groups. In relation to Sentence Comprehension, the Wald test was significant ($\chi^2 = 15.87$, $df = 4$, $p = .003$), indicating that there was a significant difference in the size of the beta paths representing the relations between General School self-concept and Sentence Comprehension achievement amongst the three student groups. Post hoc pair-wise comparisons revealed that the only significant difference was between the selective sample and other achievement comprehensive sample in relation to the effect of Time 1 Sentence Comprehension on Time 2 General School self-concept (standardised $\beta = -1.908$, $p < .001$). The cross-lagged

path representing this relation was negative for the selective students ($\beta = -.053$); however, it was significant and positive for the lower achieving comprehensive students ($\beta = .114$).

Table 7.30

Beta Paths and Significance Values for Reciprocal Relations between General School Self-Concept and English Achievement

	Spelling T2			Sentence Comp T2		
	Select	HAC	OAC	Select	HAC	OAC
	β	β	β	β	β	β
General School SC T1	-.012	.078	.088**	.019	.060	.099***
General School SC T2						
	Select	HAC	OAC			
	β	β	β			
Spelling T1	-.046	.092	.073**			
Sentence Comp T1	-.053	.073	.114***			
Goodness-of-Fit Indices						
	χ^2	df	CFI	TLI	RMSEA	
Spelling	1447.58	792	.96	.96	.04	
Sentence Comp	1518.42	792	.97	.97	.04	

Note. Sentence Comp = Sentence Comprehension; Select = selective; HAC = high achievement comprehensive; OAC = other achievement comprehensive; SC = self-concept; T1 = Time 1; T2 = Time 2.

*** $p < .001$; ** $p < .01$

Conclusions for Hypothesis 2.3.4: The reciprocal relations between General School self-concept and English achievement across student setting/achievement groups. General School self-concept and Spelling and Sentence Comprehension achievement shared significant positive reciprocal relations for the other achievement comprehensive group only. No significant reciprocal relations were found for the selective or high achieving comprehensive students, with low and predominantly negative beta paths reported for the selective sample. Subsequent Wald tests of parameter equalities showed that, largely, the strength of the beta paths was not significantly different across groups. However, the negative relation between Time 1 Sentence Comprehension and Time 2 self-concept in the selective sample was significantly different to the positive beta path in the other achievement comprehensive sample. As such, Hypothesis 2.3.4 was not supported.

Academic Buoyancy and Achievement

Results for Research Question 2.3.5: The reciprocal relations between Mathematics academic buoyancy and Mathematics achievement across student setting/achievement groups. Research Question 2.3.5 asked whether prior Mathematics academic buoyancy would be a significant predictor of later Mathematics achievement and vice versa for each of the selective, high achieving comprehensive, and other achieving comprehensive student groups. Moreover, it was asked, if significant relations are found, are they statistically similar or different across the three groups.

Table 7.31 demonstrates that the multi-group SEM analysis, controlling for SES and cultural heritage differences, did not find any significant relations between Time 1 Mathematics academic buoyancy and Time 2 Mathematics achievement for any of the three groups. For the selective school students, Time 1 Mathematics achievement was significantly positively related to Time 2 Mathematics buoyancy. The relation between prior Mathematics achievement and later Mathematics buoyancy was not significant for the high and other achieving comprehensive students. In order to determine whether the strength of the beta paths representing the effect of Time 1 Mathematics achievement on Time 2 Mathematics buoyancy differed significantly across the three groups, a Wald test of parameter equalities was conducted. The Wald test was non-significant, ($\chi^2 = 5.82$, $df = 2$, $p = .06$), indicating that there was not sufficient evidence to conclude that the strength of the beta paths differed significantly across the three groups.

Conclusions for Research Question 2.3.5: The reciprocal relations between Mathematics academic buoyancy and Mathematics achievement across student setting/achievement groups. In response to Research Question 2.3.5, prior Mathematics buoyancy was not significantly related to later Mathematics achievement for any of the student academic groups. Prior Mathematics achievement was significantly and positively associated with later buoyancy in Mathematics for the academically selective students. Whilst this relation was non-significant for the high and other achievement comprehensive students, the Wald test indicated that there was not sufficient evidence to say that the strength of the paths differed significantly across groups.

Table 7.31

Beta Paths and Significance Values for the Reciprocal Relations between Mathematics Academic Buoyancy and Mathematics Achievement

Mathematics Achievement T2				
	Selective	HAC	OAC	
	β	β	β	
Mathematics Buoyancy T1	.026	.054	.033	
Mathematics Buoyancy T2				
	Selective	HAC	OAC	
	β	β	β	
Mathematics Achievement T1	.117*	.052	.025	
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
3462.83	1458	.90	.90	.05

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2.

** $p < .05$

Results for Research Question 2.3.6: The reciprocal relations between English academic buoyancy and English achievement across student setting/achievement groups. Research Question 2.3.6 asked whether Time 1 English academic buoyancy would significantly relate to Time 2 Spelling and Sentence Comprehension achievement and vice versa, for each of the selective, high achieving comprehensive, and other achieving comprehensive student groups. Moreover, if significant relations were found, it was asked whether they were of the same magnitude across the three groups studied. Referring to Table 7.32, the multi-group SEMs reveal that across all of the academic achievement groupings, prior English academic buoyancy was not significantly related to subsequent Spelling or Sentence Comprehension achievement, and prior English achievement was not significantly related to later English academic buoyancy.

Conclusions for Research Question 2.3.6: The reciprocal relations between English academic buoyancy and English achievement across student setting/achievement groups. In response to Research Question 2.3.6, Time 1 resiliency in English did not significantly influence Time 2 achievement in Spelling or Sentence Comprehension, and Time 1 Spelling and Sentence Comprehension achievement did not significantly impact buoyancy in English at Time 2.

Table 7.32

Beta Paths and Significance Values for the Reciprocal Relations between English Academic Buoyancy and English Achievement

	Spelling T2			Sentence Comp T2		
	Select	HAC	OAC	Select	HAC	OAC
English Buoyancy T1	β -.097	β -.020	β .004	β -.058	β -.045	β .013
English Buoyancy T2						
	Select	HAC	OAC			
	β	β	β			
Spelling T1	-.061	-.050	.016			
Sentence Comp T1	-.047	-.057	.056			
Goodness-of-Fit Indices						
	χ^2	<i>df</i>	CFI	TLI	RMSEA	
Spelling	1882.88	939	.96	.96	.04	
Sentence Comp	1845.33	939	.97	.96	.04	

Note. Sentence Comp = Sentence Comprehension; Select = selective; HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2.

** $p < .01$

Parental Relations Self-Concept and Achievement

Results for Research Question 2.3.7: The reciprocal relations between Parental Relations self-concept and Mathematics achievement across student setting/achievement groups. Research Question 2.3.7 investigated whether prior Parental Relations self-concept was significantly related to subsequent Mathematics achievement, or vice versa, for the selective students, high achieving comprehensive students, and other achieving comprehensive students, holding constant any differences in SES and cultural heritage. If significant relations were found, it was further asked whether these were statistically similar or different across the groups. Referring to Table 7.33, there were no significant relations between prior Parental Relations self-concept and later Mathematics achievement (or vice versa) for any of the student groups.

Conclusions for Research Question 2.3.7: The reciprocal relations between Parental Relations self-concept and Mathematics achievement across student setting/achievement groups. In answer to Research Question 2.3.7, Time 1 Parental Relations self-concept was not significantly related to Time 2 Mathematics achievement, and Time 1 Mathematics achievement was not a significant predictor of Time 2 parental relations self-concept for any of the student setting/academic achievement groups.

Table 7.33

Beta Paths and Significance Values for the Reciprocal Relations between Parental Relations Self-Concept and Mathematics Achievement

Mathematics Achievement T2				
	Selective	HAC	OAC	
	β	β	β	
Parental Relations SC T1	.057	.077	.044	
Parental Relations SC T2				
	Selective	HAC	OAC	
	β	β	β	
Mathematics Achievement T1	.098	-.099	.024	
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
3123.31	1275	.91	.91	.05

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; SC = self-concept; T1 = Time 1; Time 2 = Time 2.

Results for Research Question 2.3.8: The reciprocal relations between Parental Relations self-concept and English achievement across student setting/achievement groups. Research Question 2.3.8 investigated whether Time 1 Parental Relations self-concept was significantly related to Time 2 English achievement, and vice versa, for the selective, high achievement comprehensive, and other achievement comprehensive students. If significant relations were found, it was further asked whether the size of the paths found was statistically similar or different across the groups. The findings emanating from the two REM models conducted across the three groups for each of the Spelling and Sentence Comprehension outcomes, controlling for SES and cultural background, are presented in Table 7.34. For the selective students, Time 1 Parental Relations self-concept significantly negatively predicted Time 2 Spelling achievement ($\beta = -.147$). The beta path for this effect was moderate, considering the strong and significant stability coefficient for Spelling achievement ($\beta = .869$). Prior Parental Relations self-concept was unrelated to later Spelling achievement for high and other achievement comprehensive students.

Subsequently, a Wald chi-square test of parameter equalities carried out in order to ascertain whether the significant beta path between Time 1 Parental Relations self-concept and Time 2 Spelling achievement found for the selective students was significantly different from the paths found for the high and other

achievement comprehensive groups. The Wald test was significant ($\chi^2 = 8.684$, $df = 2$, $p = .005$). Follow-up pairwise comparisons revealed that the negative predictive path within the selective group was significantly different to the positive path found for the other achievement comprehensive group (unstandardised $\beta = -.012$, $p = .009$), but not significantly different to the high achievement comprehensive group (unstandardised $\beta = -.006$, $p = .326$). Time 1 Spelling achievement had no significant impact on Time 2 Parental Relations self-concept for all students, irrespective of their school setting and academic achievement level. Lastly, no significant reciprocal relations were shared between Parent Relations self-concept and Sentence Comprehension achievement for any of the groups considered.

Table 7.34

Beta Paths and Significance Values for Reciprocal Relations between Parental Relations Self-Concept and English Achievement

		Spelling T2			Sentence Comp T2		
		Select	HAC	OAC	Select	HAC	OAC
		β	β	β	β	β	β
Parental Relations T1		-.147**	-.073	.016	-.026	-.069	-.041
		Parental Relations T2					
		Select	HAC	OAC			
		β	β	β			
Spelling T1		.043	-.040	.005			
Sentence Comp T1		.050	-.063	-.021			
		Goodness-of-Fit Indices					
		χ^2	df	CFI	TLI	RMSEA	
Spelling		1418.61	792	.97	.98	.04	
Sentence Comp		1439.88	792	.97	.97	.04	

Note. Sentence Comp = Sentence Comprehension; Select = selective; HAC = high achievement comprehensive; OAC = other achievement comprehensive; SC = self-concept; T1 = Time 1; T2 = Time 2.

** $p < .01$

Conclusions for Research Question 2.3.8: The reciprocal relations between Parental Relations self-concept and English achievement across student setting/achievement groups. It was found that Time 1 Parental Relations self-concept significantly negatively influenced Time 2 Spelling achievement for selective students only. The subsequent Wald test indicated that whilst there was not sufficient evidence to indicate that the strength of the predictive paths differed significantly between the selective and high achievement comprehensive students,

this negative relation was not present for the other achievement comprehensive students. For all groups, Time 1 Spelling achievement did not significantly impact on later Parent Relations self-concept. Lastly, relations with parents, and achievement in the domain of Sentence Comprehension, did not share any significant reciprocal effects for any of the student groups.

Parental Pressure to Achieve and Achievement

Results for Research Question 2.3.9: The reciprocal relations between Parental pressure to achieve and Mathematics achievement across student setting/achievement groups. Research Question 2.3.9 asked whether prior Parental pressure to achieve would be significantly related to later achievement in Mathematics, and vice versa, for the three groups of students: selective, high achievement comprehensive, and other achievement comprehensive. Furthermore, if any relations were found, it was asked whether they were similar or different across the three groups. A multi-group SEM, controlling for any differences in SES and cultural background, was conducted to answer the research question.

The results are displayed in Table 7.35. For all students, irrespective of their school setting or achievement level, Time 1 Parental pressure to achieve did not significantly relate to Time 2 Mathematics achievement. For the selective students, prior Mathematics achievement was significantly positively related to later Parent pressure to achieve ($\beta = .104$). Although the effect size for this beta path was small, the large and significant stability path for pressure to achieve ($\beta = .702$) means that there cannot be many further large predictors of pressure. There was no significant relation between prior Mathematics achievement and later Parent pressure to achieve for the high and other achievement comprehensive students. A Wald chi-square test was conducted to determine the equivalence of the parameter estimates for the effect of Mathematics achievement at Time 1 on Parental pressure to achieve at Time 2 across the three groups of interest. The outcome was non-significant ($\chi^2 = 2.83$, $df = 2$, $p = .34$), showing that the sizes of the beta paths were not significantly different across the groups.

Conclusions for Research Question 2.3.9: The reciprocal relations between Parental pressure to achieve and Mathematics achievement across student setting/achievement groups. In response to Research Question 2.3.9 Time 1 Parent pressure to achieve did not significantly impact Time 2 Mathematics achievement for any of the student groups. Time 1 Mathematics achievement was

significantly related to increased Parental pressure to achieve at Time 2 for the academically selective students, but not for the high or other achievement comprehensive students. However, the Wald test indicated that there was not adequate evidence to conclude that the strength of the beta paths for this effect differed significantly across groups.

Table 7.35

Beta Paths and Significance Values for the Reciprocal Relations between Parental Pressure to Achieve and Mathematics Achievement

Mathematics Achievement T2					
	Selective	HAC	OAC		
	β	β	β		
Parental Pressure T1	.052	-.045	-.050		
Parental Pressure T2					
	Selective	HAC	OAC		
	β	β	β		
Mathematics Achievement T1	.104*	.057	.019		
Goodness-of-Fit Indices					
	χ^2	df	CFI	TLI	RMSEA
	3269.10	1275	.90	.90	.05

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; Time 2 = Time 2.

* $p < .05$

Results for Research Question 2.3.10: The reciprocal relations between Parental pressure to achieve and English achievement across student setting/achievement groups. Research Question 2.3.10 asked if there was any significant impact of Time 1 Parental pressure to achieve on Time 2 English achievement (Spelling and Sentence Comprehension), and Time 1 English achievement on Time 2 Parent pressure to achieve for the selective, high achievement comprehensive, and other achievement comprehensive students. Furthermore, it was asked if any impact found was similar or different across the three groups. As displayed in Table 7.36, the multi-group SEM analyses revealed that controlling for SES and cultural background, Time 1 Parental pressure to achieve significantly negatively predicted Time 2 Spelling achievement for selective students only ($\beta = -.168$). The moderate beta path, taking into account the large and significant stability effect for Spelling achievement ($\beta = .848$), is of practical importance.

Table 7.36

Beta Paths and Significance Values for the Reciprocal Relations between Parental Pressure to Achieve and English Achievement

	Spelling T2			Sentence Comp T2		
	Select	HAC	OAC	Select	HAC	OAC
	β	β	β	β	β	β
Parental Pressure T1	-.168***	-.078	.051	-.067	.061	.059
	Parental Pressure T2					
	Select	HAC	OAC			
	β	β	β			
Spelling T1	.091	-.074	.023			
Sentence Comp T1	.034	-.038	-.024			
	Goodness-of-Fit Indices					
	χ^2	df	CFI	TLI	RMSEA	
Spelling	1639.22	792	.94	.94	.04	
Sentence Comp	1580.70	792	.96	.96	.04	

Note. Sentence Comp = Sentence Comprehension; Select = selective; HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2.

*** $p < .001$

A Wald chi-square test was performed on the Spelling model in order to ascertain whether the relations between Time 1 Parental pressure and Time 2 Spelling were of a similar magnitude across the three groups. The Wald test was significant ($\chi^2 = 9.42$, $df = 2$, $p = .005$). Subsequent pairwise comparisons showed that the negative predictive path within the selective group was significantly different to the positive path found for the other achievement comprehensive group (unstandardised $\beta = -.021$, $p = .002$), but not significantly different to the high achievement comprehensive group (unstandardized $\beta = -.015$, $p = .117$). Furthermore, Prior Spelling achievement did not significantly impact later Parental pressure to achieve for any of the student groups. Finally, for the selective, high achievement comprehensive, and other achievement comprehensive students alike, Parental pressure to achieve and Sentence Comprehension achievement did not share any significant reciprocal relations.

Conclusions for Research Question 2.3.10: The reciprocal relations between Parental pressure to achieve and English achievement across student setting/achievement groups. In answer to the proposed Research Question 2.3.10, the results reveal that prior Parental pressure to achieve significantly negatively predicted later Spelling achievement for the selective students only. The results of the subsequent Wald test indicate that despite the non-significant beta path between

Time 1 Parental pressure and Time 2 Spelling for the high achievement comprehensive students, its strength was similar to that with the selective students. For the other achievement comprehensive students, the Wald test indicated that the significant negative relation between prior Parent pressure and later Spelling was not represented. For all of the students, irrespective of their academic setting or achievement level, Time 1 Spelling achievement did not relate to Time 2 Parental pressure to achieve. Moreover, Parental pressure and Sentence comprehension achievement did not share any significant mutual impact across the groupings.

Teacher Pressure to Achieve and Achievement

Results for Research Question 2.3.11: The reciprocal relations between Teacher pressure to achieve and Mathematics achievement across student setting/achievement groups. Research Question 2.3.11 asked whether prior Teacher pressure to achieve had a significant relation to subsequent Mathematics achievement, and prior Mathematics achievement had a significant relation to later Teacher pressure to achieve for each of the three student setting/academic achievement groups: selective, high achievement comprehensive, and other achievement comprehensive. Moreover, it was asked, if significant relations are found, are they similar across all three groups. Table 7.37 presents the results of the three REMs conducted simultaneously across the groups, holding constant any differences in student SES and cultural heritage. For all students, Time 1 Teacher pressure did not significantly affect Time 2 Mathematics achievement, and Time 1 Mathematics achievement was not significantly related to Time 2 Teacher pressure to achieve.

Conclusions for Research Question 2.3.11: The reciprocal relations between Teacher pressure to achieve and Mathematics achievement across student setting/achievement groups. In answer to Research Question 2.3.11, Teacher pressure to achieve and Mathematics achievement did not share any significant reciprocal relations across time.

Table 7.37

Beta Paths and Significance Values for the Reciprocal Relations between Teacher Pressure to Achieve and Mathematics Achievement

Mathematics Achievement T2				
	Selective	HAC	OAC	
	β	β	β	
Teacher Pressure T1	.052	-.024	-.012	
Teacher Pressure T2				
	Selective	HAC	OAC	
	β	β	β	
Mathematics Achievement T1	.088	.027	.032	
Goodness-of-Fit Indices				
χ^2	<i>Df</i>	CFI	TLI	RMSEA
3114.31	1275	.90	.90	.05

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; Time 2 = Time 2.

* $p < .05$

Results for Research Question 2.3.12: The reciprocal relations between Teacher pressure to achieve and English achievement across student setting/achievement groups. Research Question 2.3.12 asked whether prior Teacher pressure to achieve had a significant impact on subsequent English achievement (comprised of Spelling and Sentence Comprehension), and whether prior English achievement was significantly related to later Teacher pressure to achieve for each of the three student setting/academic achievement groups: selective, high achievement comprehensive, and other achievement comprehensive. If any significant relations were found, it was further asked whether these relations were of the same magnitude for all three student groups. The beta paths and significance values resulting from the multi-group SEMs, holding constant student SES and cultural background, are presented in Table 7.38. The findings demonstrate that for the selective students, Time 1 Teacher pressure to achieve was significantly negatively related to later achievement in Spelling ($\beta = -.158$). Considering the large and significant stability path for Spelling achievement ($\beta = .823$), the effect size for this relation is of practical importance. For the high achievement and other achievement comprehensive students, this relation was non-significant.

In order to ascertain whether the size of the cross-lagged paths between Time 1 Teacher pressure and Time 2 Spelling achievement differed across the selective, high achievement comprehensive, and other achievement comprehensive groups, a

Wald chi-square test of parameter equalities was run. The Wald test was significant ($\chi^2 = 10.52$, $df = 2$, $p = .005$), indicating that the strength of the paths significantly differed across the three groups. Follow-up pairwise comparisons demonstrated that the negative beta path for the selective students was significantly different to the positive beta path found for the other achievement comprehensive group (unstandardized $\beta = -.018$, $p = .001$). There was no significant difference in the magnitude of the beta paths for this relation between the selective and high achievement comprehensive groups (unstandardized $\beta = -.015$, $p = .062$). There was no significant impact of prior Spelling achievement on later Teacher pressure to achieve for any of the groups. Lastly, there no significant reciprocal relations were found between Teacher pressure to achieve and Sentence Comprehension achievement for any of the groups.

Table 7.38

Beta Paths and Significance Values for the Reciprocal Relations between Teacher Pressure and English Achievement

	Spelling T2			Sentence Comp T2		
	Select	HAC	OAC	Select	HAC	OAC
	β	β	β	β	β	β
Teacher Pressure T1	-.159***	-.026	.053	.013	-.005	.035
	Teacher Pressure T2					
	Select	HAC	OAC			
	β	β	β			
Spelling T1	.042	-.045	.020			
Sentence Comp T1	.053	-.017	.036			
	Goodness-of-Fit Indices					
	χ^2	df	CFI	TLI	RMSEA	
Spelling	1473.71	792	.95	.95	.04	
Sentence Comp	1444.89	792	.96	.96	.04	

Note. Sentence Comp = Sentence Comprehension; Select = selective; HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2.

*** $p < .001$

Conclusions for Research Question 2.3.12: The reciprocal relations between Teacher pressure to achieve and English achievement across student setting/achievement groups. Answering Research Question 2.3.12, prior Teacher pressure to achieve was a significant negative predictor of later Spelling achievement for the selective students, with this relation being non-significant for the high and other achievement comprehensive students. A subsequent Wald test indicated that

there was sufficient evidence to support the conclusion that the negative relation between Time 1 Teacher pressure and Time 2 Spelling achievement was not present for the other achievement comprehensive students. There was no significant relation between Time 1 Spelling achievement and Time 2 Teacher pressure for any of the student groups. Furthermore, for all students, there were no significant reciprocal relations found between Teacher pressure to achieve and Sentence Comprehension achievement.

Depression and Achievement

Results for Research Question 2.3.13: The reciprocal relations between Depression and Mathematics achievement across student setting/achievement groups. Research Question 2.3.13 asked whether prior Depression significantly predicted later Mathematics achievement, and whether previous Mathematics achievement was related to subsequent levels of Depression for the three student setting/academic achievement groups: selective, high achievement comprehensive, and other achievement comprehensive. Furthermore, if any significant effects were found, it was also asked whether these were similar or different across the groups. Referring to Table 7.39, prior Depression was not significantly related to later Mathematics achievement or vice versa (controlling for SES and cultural background), for any of the groups of interest.

Table 7.39

Beta Paths and Significance Values for the Reciprocal Relations between Depression and Mathematics Achievement

Mathematics Achievement T2				
Depression T1	Selective		HAC	OAC
	β		β	β
	-.016		-.024	-.053
Depression T2				
Mathematics Achievement T1	Selective		HAC	OAC
	β		β	β
	.033		.057	.019
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
4336.90	1860	.90	.90	.05

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; Time 2 = Time 2.

Conclusions for Research Question 2.3.13: The reciprocal relations between Depression and Mathematics achievement across student setting/achievement groups. Answering Research Question 2.3.13, prior depressive tendencies did not significantly impact on later Mathematics achievement or vice versa for any of the students, irrespective of their school setting or achievement level.

Results for Research Question 2.3.14: The reciprocal relations between Depression and English achievement across student setting/achievement groups. Research Question 2.3.14 asked whether Time 1 Depression significantly impacted Time 2 English achievement (Spelling and Sentence Comprehension), and whether Time 1 English achievement was significantly related to Time 2 Depression for the three groups of interest: selective, high achievement comprehensive, and other achievement comprehensive students. Moreover, if any significant effects were found, it was further examined whether the relations were similar or different across the three groups. Two multi-group SEMs were conducted for each of the English achievement outcomes, controlling for SES and cultural background. The findings, displayed in Table 7.40, do not indicate any significant reciprocal relations between the Depression and English achievement constructs for the selective, high, and other achievement comprehensive students.

Table 7.40

Beta Paths and Significance Values for the Reciprocal Relations between Depression and English Achievement

Spelling T2				Sentence Comp T2		
	Select	HAC	OAC	Select	HAC	OAC
	β	β	β	β	β	β
Depression T1	.040	.008	-.028	-.037	-.005	-.029
Depression T2						
	Select	HAC	OAC			
	β	β	β			
Spelling T1	.023	.050	.032			
Sentence Comp T1	-.054	-.057	-.044			
Goodness-of-Fit Indices						
	χ^2	Df	CFI	TLI	RMSEA	
Spelling	2558.72	1269	.95	.96	.04	
Sentence Comp	2609.69	1269	.95	.95	.04	

Note. Sentence Comp = Sentence Comprehension; Select = selective; HAC = high achievement comprehensive; OAC = other achievement comprehensive.

Conclusions for Research Question 2.3.14: The reciprocal relations between Depression and English achievement across student setting/achievement groups. For all students, prior depressive tendencies did not significantly impact later achievement in English, and prior English achievement was not significantly related to later levels of depression.

Anxiety and Achievement

Results for Research Question 2.3.15: The reciprocal relations between Anxiety and Mathematics achievement across student setting/achievement groups. Research Question 2.3.15 asked whether Anxiety and Mathematics achievement shared any significant reciprocal relations, and whether any relations found were similar or different across the selective, high achievement comprehensive, and other achievement comprehensive groupings. The results of the multi-group SEM analysis, holding constant any student differences in SES and cultural background, are presented in Table 7.41. Across all three groups, prior Anxiety was not significantly linked to later achievement in Mathematics. For the students located in the academically selective school, Mathematics achievement at Time 1 was significantly negatively related to Anxiety at Time 2 ($\beta = -.158$). However, these relations were not significant for the high or other achievement comprehensive students.

Table 7.41

Beta Paths and Significance Values for the Predictive Relations of Time 1 Anxiety on Time 2 Mathematics Achievement

Mathematics Achievement T2				
Anxiety T1	Selective	HAC	OAC	
	β	β	β	
	.080	-.077	-.037	
Anxiety T2				
Mathematics Achievement T1	Selective	HAC	OAC	
	β	β	β	
	-.158**	.097	.007	
Goodness-of-Fit Indices				
χ^2	df	CFI	TLI	RMSEA
4060.02	1860	.90	.90	.04

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; Time 2 = Time 2.

** $p < .01$

In order to determine whether the size of the cross-lagged paths representing the effect of Time 1 Mathematics achievement on Time 2 Anxiety were of a similar strength across the three student groups, a Wald chi-square test of parameter equalities was conducted. The Wald test was significant ($\chi^2 = 9.001$, $df = 2$, $p = .009$), demonstrating that there was sufficient evidence to demonstrate that the size of the beta paths differed significantly somewhere across the groups. Subsequent post-hoc, pairwise comparisons revealed that the negative relation between prior Mathematics achievement and later Anxiety found within the selective student sample was significantly different to the positive beta paths reported for the high achieving comprehensive sample (standardised $\beta = -2.80$, $p = .003$) and the other achieving comprehensive sample (standardised $\beta = -2.08$, $p = .008$).

Conclusions for Research Question 2.3.15: The reciprocal relations between Anxiety and Mathematics achievement across student setting/achievement groups. In response to Research Question 2.3.15, there were no significant relations between Time 1 Anxiety and Time 2 Mathematics achievement for any of the students, irrespective of their school setting or academic achievement level. For the selective students, prior Mathematics achievement was significantly negatively related to later levels of Anxiety levels. The same relations were not significant for both groups of comprehensive students, and from the Wald test there is sufficient evidence to indicate that the path representing the effect of Time 1 Mathematics achievement on Time 2 Anxiety was significantly stronger and more negative than the paths found in the high and other achieving comprehensive samples.

Results for Research Question 2.3.16: The reciprocal relations between Anxiety and English achievement across student setting/achievement groups. Research Question 2.3.16 asked whether Time 1 Anxiety would have any significant relations with Time 2 English achievement (comprising Spelling and Sentence Comprehension facets), and whether Time 1 English achievement would significantly impact Time 2 Anxiety within any of the student setting/achievement groups. If any significant relations were found, it was further asked whether the relations were statistically similar across the groups. Table 7.42 displays the results of the two REMs conducted for Spelling and Sentence Comprehension achievement, controlling for any differences in student SES and cultural heritage. For all students, regardless of their school setting or academic achievement level, Anxiety at Time 1

was not significantly related to English achievement in either domain at Time 2, and English achievement at Time 1 was not significantly related to Anxiety at Time 2.

Table 7.42

Beta Paths and Significance Values for the Reciprocal Relations between Anxiety and English Achievement

	Spelling T2			Sentence Comp T2		
	Select	HAC	OAC	Select	HAC	OAC
	β	β	β	β	β	β
Anxiety T1	.089	-.067	-.035	.035	-.040	-.042
	Anxiety T2					
	Select	HAC	OAC			
	β	β	β			
Spelling T1	.082	.065	.051			
Sentence CompT1	.095	.016	-.007			
	Goodness-of-Fit Indices					
	χ^2	df	CFI	TLI	RMSEA	
Spelling	2271.09	1269	.94	.94	.04	
Sentence Comp	2194.12	1269	.96	.96	.03	

Note. Sentence Comp = Sentence Comprehension; Select = selective; HAC = high achievement comprehensive; OAC = other achievement comprehensive.

*** $p < .001$

Conclusions for Research Question 2.3.16: The reciprocal relations between Anxiety and English achievement across student setting/achievement groups. The findings emanating from the multi-group SEMs indicated that for the three student groups, prior Anxiety had no significant impact on later English achievement, and prior English achievement had no significant relation to later Anxiety.

The Impact of Cultural Background on Academic Achievement Mathematics Achievement

Results for Research Question 2.4.1: Cultural background differences on Mathematics achievement across student achievement groupings. Research Question 2.4.1 asked whether there were any significant differences between Anglo Australian and non-Anglo Australian students in relation to their Mathematics achievement at Time 1 or Time 2, in terms of total effects and change over time. Moreover, if any significant relations were found, were they similar or different across the two student achievement groups that met sample size requirements for the

analysis: high and other achievement comprehensive. In order to answer this question, a longitudinal SEM with a comparison between the cultural backgrounds on Time 1 and Time 2 Mathematics achievement scores was performed simultaneously across the high and other achieving comprehensive groups. In interpreting the results, Anglo background students were coded as -1 and non-Anglo background as +1 in the comparison. Hence, a negative beta indicates that the Anglo-background students had higher scores than the non-Anglo-background students; a positive beta indicates that the non-Anglo-background students had higher scores than the Anglo-background students.

As shown in Table 7.43, significant total effects for Time 1 and Time 2 were found for both groups. Specifically, controlling for SES, the non-Anglo students performed significantly better in Mathematics than did the Anglo students at Time 1 and Time 2. This finding was similar, whether students were classified as high or other achievement level in the comprehensive setting. The beta paths show that the effect sizes for these findings were moderate to large (Cohen, 1988), indicating that a non-Anglo background explained a substantial amount of variance in higher Mathematics achievement scores. The change over time results were both non-significant for each of the achievement groupings, meaning that when prior Time 1 Mathematics achievement was also controlled for, the differences between the cultural groups on the Mathematics test scores remained the same over time.

Table 7.43

Cultural Background Differences in Mathematics Achievement across Achievement Groupings

	HAC		OAC		
	Maths Ach T1	Maths Ach T2	Maths Ach T1	Maths Ach T2	
	β	β	β	β	
Total Effects	.431***	.338***	.373***	.324***	
Change Over Time		-.011		.001	
Goodness-of-Fit Indices					
	χ^2	df	CFI	TLI	RMSEA
	1091.13	446	.94	.93	.04

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; Maths Ach = Mathematics achievement; T1 = Time 1; T2 = Time 2. Anglo-background students were coded -1 and non-Anglo-background students were coded +1.

*** $p < .001$

To test whether the predictive paths between cultural background and Time 1 and Time 2 Mathematics achievement were similar or different in strength across the achievement groupings (high and other achievement comprehensive), a Wald chi-square test of parameter equalities was carried out. The Wald test was non-significant ($\chi^2 = 9.37$, $df = 3$, $p = .05$), showing that the sizes of the cultural differences on Mathematics achievement were statistically similar across groups.

Conclusions for Research Question 2.4.1: Cultural background differences on Mathematics achievement across student achievement groupings.

Answering Research Question 2.4.1, non-Anglo students in the comprehensive schools performed significantly better than the students of an Anglo background in Mathematics at Time 1 and Time 2; however they showed no significant growth over time. That is, over and above the significant difference found at Time 1, non-Anglo students did not make any further gains in Mathematics when compared to their Anglo peers. The Wald test indicates that these relations were similar for all students, regardless of whether they were considered to be high or lower level achievers.

Spelling Achievement

Results for Research Question 2.4.2: Cultural background differences on Spelling achievement across student achievement groupings. Research Question 2.4.2 asked whether Anglo and non-Anglo students differed significantly on Spelling achievement at Time 1 or Time 2, in terms of total effects and change over time. Furthermore, if significant differences were found, were they similar or different for the comprehensive school high achievers and other achievers. The multi-group SEM results in answer to these questions are presented in Table 7.44, and show that across both of the achievement groups within the comprehensive setting, there were no significant differences between Anglo and non-Anglo students on Spelling achievement at Time 1 or Time 2, controlling for SES. This situation was maintained at Time 2 when Time 1 Spelling achievement was further controlled for.

Conclusions for Research Question 2.4.2: Cultural background differences on Spelling achievement across student achievement groupings. The results show that comprehensive students, regardless of their achievement level or cultural background, achieved similar results in Spelling at both testing points; this did not change over time.

Table 7.44

Cultural Background Differences on Spelling Achievement across Achievement Groupings

	HAC		OAC		
	Spelling T1	Spelling T2	Spelling T1	Spelling T2	
	β	β	β	β	
Total Effects	.075	.031	.004	.008	
Change Over Time		-.044		.061	
Goodness-of-Fit Indices					
	χ^2	df	CFI	TLI	RMSEA
	596.04	212	.96	.95	.05

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2. Anglo-background students were coded -1 and non-Anglo-background students were coded +1.

Sentence Comprehension Achievement

Results for Research Question 2.4.3: Cultural background differences on Sentence Comprehension achievement across student achievement groupings.

Research Question 2.4.3 asked whether differing cultural backgrounds (Anglo or non-Anglo) differentially impacted on the Sentence Comprehension achievement of students in relation to Time 1 and Time 2 total effects, and change over time.

Additionally, if a difference was uncovered, was this of the same strength for both high and other level comprehensive achievers? Two longitudinal SEMs comparing the Time 1 and Time 2 Sentence Comprehension achievement scores of the Anglo and non-Anglo students were performed simultaneously across the comprehensive school achievement groups.

As can be seen from Table 7.45, significant Time 1 and Time 2 total effects were found for both achievement groups. That is, holding SES constant, non-Anglo students performed significantly worse in Sentence Comprehension achievement than did the students of an Anglo background at both testing points. The effect sizes for the total effects indicate that cultural background accounted for a practical amount of variance in Sentence achievement scores (Cohen, 1988). When SES and prior Sentence Comprehension achievement were controlled for to test for change over time, the Anglo students did not make significant gains in Sentence Comprehension achievement at Time 2 over the non-Anglo students.

Table 7.45

Cultural Background Differences on Sentence Comprehension Achievement across Achievement Groupings

	HAC		OAC	
	Sentence T1	Sentence T2	Sentence T1	Sentence T2
	β	β	β	β
Total Effects	-.245***	-.195***	-.233***	-.171***
Change Over Time		.067		-.005
Goodness-of-Fit Indices				
	χ^2	df	CFI	TLI
	451.90	212	.98	.98
				RMSEA
				.04

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2. Anglo-background students were coded -1 and non-Anglo-background students were coded +1.

*** $p < .001$

The Wald chi-square test of parameter equalities was non-significant ($\chi^2 = 7.24$, $df = 3$, $p = .07$), showing that the magnitude of the cultural differences on Sentence Comprehension achievement was essentially the same for both high and lower achieving comprehensive students.

Conclusions for Research Question 2.4.3: Cultural background differences on Sentence Comprehension achievement across student achievement groupings. The results of the SEM conducted to answer Research Question 2.4.3 show that the Anglo-background students performed significantly better in Sentence Comprehension than did the non-Anglo students initially, and although they sustained this edge, they did not continue to make significant gains over time. The Wald test indicated that these findings were the same for all comprehensive students.

The Impact of Cultural Background on Select Psychosocial Outcomes Mathematics Self-Concept

Results for Research Question 2.5.1: Cultural background differences on Mathematics self-concept across student achievement groupings. Research Question 2.5.1 asked whether students of an Anglo cultural background would differ significantly to students of a non-Anglo background in terms of their Mathematics self-concepts across time. Furthermore, if any differences were found, would they be similar for comprehensive school students previously classified as high achievers and other achievers. Referring to Table 7.46, it was found that for the high achieving comprehensive group, cultural background did not impact differentially on students'

perceptions of their abilities in Mathematics at Time 1 or Time 2. For the other achievement comprehensive students, both total effects were significant, controlling for SES. These indicate that the non-Anglo students within this group reported significantly higher self-concepts in Mathematics than the Anglo students. Whilst the beta paths indicate small effect sizes for these findings (Cohen, 1988) the results have important implications when paired with the qualitative findings, which were the impetus for these analyses. Lastly, when Time 1 Mathematics self-concept was also controlled for, the change over time findings show that the difference in self-concept levels remained similar across time for the other achievement comprehensive students.

Table 7.46

Cultural Background Differences on Mathematics Self-Concept across Achievement Groupings

	HAC		OAC		
	Maths SC T1	Maths SC T2	Maths SC T1	Maths SC T2	
	β	β	β	β	
Total Effects	.096	.029	.117***	.108***	
Change Over Time		.002		.025	
Goodness-of-Fit Indices					
	χ^2	df	CFI	TLI	RMSEA
	1675.61	522	.93	.93	.05

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; SC = self-concept; T1 = Time 1; T2 = Time 2. Anglo-background students were coded -1 and non-Anglo-background students were coded +1.

*** $p < .001$

To determine whether the predictive relations between culture and Mathematics self-concept were significantly different across the academic groupings, a Wald chi-square test of parameter equalities was conducted, producing non-significant results ($\chi^2 = 10.80$, $df = 3$, $p = .05$). Essentially, the strength of the paths was not substantially different between the two groups.

Conclusions for Research Question 2.5.1: Cultural background differences on Mathematics self-concept across student achievement groupings.

The data indicate that for those students classified as having a lower achievement level within the comprehensive setting, the non-Anglo students reported significantly better Mathematics self-concepts at both time points. However, the magnitude of the difference was maintained over time. Whilst the beta paths for the total effects were

non-significant for the high achieving comprehensive group, the Wald test indicated that the strength of the paths did not differ significantly between the two groups.

English Self-Concept

Results for Research Question 2.5.2: Cultural background differences on English self-concept across student achievement groupings. Research Question 2.5.2 asked whether students of diverse cultural backgrounds would differ significantly with regard to their self-perceptions in English at Time 1 or Time 2, in relation to total effects and change over time. If cultural background was significantly related to English self-concept, was this relation similar or different for both high and other level comprehensive achievers. The results of the multi-group SEM analysis are depicted in Table 7.47. Specifically, the high achieving non-Anglo background students reported significantly lower self-concepts in English than their high achieving Anglo peers at Time 1. Whilst this difference was maintained at Time 2, the Anglo students did not make any further gains in self-concept over the non-Anglo students when Time 1 English self-concept was also held constant. For the other achievement students within the comprehensive setting, cultural background did not significantly impact on their English self-perceptions at Time 1 or Time 2.

Table 7.47

Cultural Background Differences on English Self-Concept across Achievement Groupings

	HAC		OAC	
	English SC T1	English SC T2	English SC T1	English SC T2
	β	β	β	β
Total Effects	-.142***	-.120***	-.031	-.032
Change Over Time		-.010		-.009
Goodness-of-Fit Indices				
	χ^2	df	CFI	TLI
	1289.68	718	.97	.97
				RMSEA
				.03

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; SC = self-concept; T1 = Time 1; T2 = Time 2. Anglo-background students were coded -1 and non-Anglo-background students were coded +1.

*** $p < .001$

The subsequent Wald chi-square test of parameter equalities was non-significant ($\chi^2 = 2.36$, $df = 3$, $p = .49$), indicating that the strength of the predictive

paths between culture and English self-concept was not significantly different across the high and other achievement comprehensive groups.

Conclusions for Research Question 2.5.2: Cultural background differences on English self-concept across student achievement groupings.

Answering Research Question 2.5.2, non-Anglo high achievers held significantly worse perceptions of their abilities in English than Anglo high achievers at Time 1 and Time 2. However, while this situation was maintained at Time 2, they showed no further decline between Times 1 and 2. That is, over and above the significant difference found at Time 1, Anglo high achievers did not make any further gains in English self-concept when compared to their non-Anglo high achieving peers. The subsequent Wald test indicated that whilst the beta paths for the lower achievement comprehensive students were non-significant, there was not sufficient evidence to support the conclusion that the cultural differences were absent for this group.

Parental Relations Self-Concept

Results for Research Question 2.5.3: Cultural background differences on Parental Relations self-concept across student achievement groupings. Research Question 2.5.3 asked whether Anglo and non-Anglo students located within the comprehensive setting would possess similar or different Parental Relations self-concepts at Time 1 and Time 2, measured as total effects and as change over time. Moreover, if a significant impact was found, was this the same for the two academic groupings. The results of the group comparison SEM are presented in Table 7.48, and show that all total effects tested were statistically significant across both groups. That is, controlling for SES, the non-Anglo students reported significantly lower Parental Relations self-concepts than the Anglo students, irrespective of their achievement level. The effect sizes indicate that possessing a non-Anglo cultural background accounted for a moderate amount of variance in the students' lowered perceptions of their relationships with their parents (Cohen, 1988). In evaluating change over time, the data showed that when prior Parental Relations self-concept differences at Time 1 were controlled for at Time 2, the non-Anglo students made no further declines in reported self-concept, compared to their Anglo peers. Again, this finding was the same for both achievement groups within the comprehensive setting.

Table 7.48

Cultural Background Differences on Parental Relations Self-Concept across Achievement Groupings

	HAC		OAC	
	Parent SC T1	Parent SC T2	Parent SC T1	Parent SC T2
Total Effects	β -.146**	β -.112**	β -.148***	β -.104**
Change Over Time		.032		.009
Goodness-of-Fit Indices				
	χ^2	Df	CFI	TLI
	2287.22	1077	.95	.95
				RMSEA .04

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; SC = self-concept; T1 = Time 1; T2 = Time 2. Anglo-background students were coded as -1 and non-Anglo-background students were coded as +1.

*** $p < .001$; ** $p < .01$

The Wald chi-square test of parameter equalities was non-significant ($\chi^2 = 2.27$, $df = 3$, $p = .52$), and indicated that the relations between cultural background and Parental Relations self-concept were statistically similar across the high achievement and other achievement comprehensive groups.

Conclusions for Research Question 2.5.3: Cultural background differences on Parental Relations self-concept across student achievement groupings. Students of a non-Anglo cultural background within the comprehensive school, regardless of their achievement level, reported significantly worse relations with their parents than did students of Anglo background at Time 1 and Time 2. Change over time analyses showed that whilst this difference was maintained at both time points, there was no further decline in relations over time. The Wald test subsequently demonstrated that the strength of the difference was statistically similar across both achievement groups.

Parental Pressure to Achieve

Results for Research Question 2.5.4: Cultural background differences on Parental pressure to achieve across student achievement groupings. Research Question 2.5.4 asked whether the cultural background of students (Anglo or non-Anglo) differentially affected the pressure they received from their parents to do well academically at Time 1 and Time 2, in regard to total effects and change over time. Furthermore, it was asked if significance was found, would the predictive paths be similar or different across the two academic groups: high and other achievement

comprehensive. As can be seen from Table 7.49, controlling for SES, the non-Anglo students reported significantly higher Parental pressure to achieve than did the Anglo students, regardless of their academic achievement level. The beta path values indicated moderate effect sizes for these findings (Cohen, 1988). The change over time analyses reached significance for the other achievement comprehensive group—when Time 1 Parental pressure differences were also controlled for at Time 2, the non-Anglo students made further gains in reported pressure over their Anglo peers.

Table 7.49

Cultural Background Differences on Parental Pressure to Achieve across Achievement Groupings

	HAC		OAC	
	Parent Pressure T1	Parent Pressure T2	Parent Pressure T1	Parent Pressure T2
	β	β	β	β
Total Effects	.248***	.157**	.204***	.237***
Change Over Time		.015		.101***
Goodness-of-Fit Indices				
	χ^2	df	CFI	TLI
	2480.14	1077	.93	.92
				RMSEA
				.04

Note. HAC = high achievement comprehensive; OAC = other achievement comprehensive; T1 = Time 1; T2 = Time 2. Anglo-background students were coded as -1 and non-Anglo-background students were coded as +1.

*** $p < .001$; ** $p < .01$

In order to ascertain whether the differences in Parental pressure were similar across the achievement groups, a Wald chi-square test of parameter equalities was conducted. The Wald test was non-significant ($\chi^2 = 2.31$, $df = 3$, $p = .51$), meaning that the strength of the predictive paths between culture and Parental pressure to achieve was similar for all comprehensive students.

Conclusions for Research Question 2.5.4: Cultural background differences on Parental pressure to achieve across student achievement groupings. In response to Research Question 2.5.4, it was found that regardless of achievement level, non-Anglo students reported receiving significantly greater pressure to achieve from their parents than did Anglo students at both time points. Moreover, this difference significantly increased over time for those students of a lower achievement level within the comprehensive setting. The Wald chi-square test

of parameter equalities indicates that the differences between cultures on Parental pressure to achieve were of the same magnitude, irrespective of achievement level.

Chapter Summary

This chapter has presented a wealth of quantitative results, which have investigated: (i) the impact of diverse school settings (academically selective and mixed-achievement level comprehensive) on academic achievement and psychosocial wellbeing; (ii) the reciprocal relations between the various psychosocial factors and the academic achievement constructs across time, and how they are similar or different for students within differing educational settings and achievement levels; and (iii) the impact of diverse cultural backgrounds (Anglo and non-Anglo) on the academic achievement and psychosocial wellbeing of students across differing achievement levels. A brief summary of the key findings in relation to these areas is now presented.

The findings show that students located within the academically selective setting achieved significantly better results in Mathematics, Spelling, and Sentence Comprehension achievement across all time waves, and value-added in the domains of Mathematics and Spelling, as compared to the high achievers located within the comprehensive setting. Whilst the comprehensive school high achievers received significantly better scores across all three academic domains compared to their lower achievement level peers, and value-added in Spelling, they failed to value-add in the Mathematics and Sentence Comprehension achievement tests.

As predicted, the selective students possessed significantly lower Mathematics, English, and General School self-concepts than did the high achieving students situated within the comprehensive setting at Time 1 and Time 2, and this gap became significantly wider over time for Mathematics self-concept. Across the three domains of academic self-concept, the high achievement and other achievement comprehensive student groups reported statistically similar levels of self-concept. In regard to Parental Relations self-concept, the academically selective students reported significantly lower perceptions of their relations with their parents than did their high achieving counterparts within the comprehensive schools. Students within the comprehensive setting, regardless of their achievement level, reported similar levels of Parental Relations self-concept.

The analyses involving Anxiety indicated that at the commencement of the school year, the high achievers within the comprehensive schools were significantly more anxious than the selective students. However, by the end of the school year this finding was reversed. The students of a lower achievement level in the comprehensive setting reported significantly higher anxious tendencies than did their high achieving peers at Time 1 and Time 2, with the magnitude of the difference widening over time. However, the effect sizes for these differences were small. Within the present study, attending a selective or comprehensive school did not appear to impact differentially on high achieving students' buoyancy in Mathematics and English, their experiences of Parental or Teacher pressure to achieve, and their levels of Depression.

With regard to the reciprocal relations between the various psychosocial wellbeing and achievement constructs across time, some findings are of note. Prior Mathematics self-concept was a significant positive predictor of later Mathematics achievement and vice versa, and General School self-concept was significantly positively linked to later Mathematics achievement and vice versa for the lower achievement comprehensive group only. Whilst these relations were not significant for the selective or high achievement comprehensive students, the beta path values were in the predicted direction and of a similar magnitude. Hence, support for the REMs for Mathematics self-concept and Mathematics achievement, and General School self-concept and Mathematics achievement, was concluded for all three setting/achievement groups.

The other achievement comprehensive group also reported significant positive reciprocal relations between English self-concept and both Spelling and Sentence Comprehension achievement domains, and between General School self-concept and both English achievement domains. However, whilst the beta paths representing these relations for the high achievement comprehensive group were of a similar magnitude and in the predicted direction, the beta paths for the selective students were predominantly small, and some were negative. However, the Wald test largely supported that the beta paths were not statistically different across the three groups. It was concluded that the REMs for English self-concept and English achievement, and General School self-concept and English achievement, were supported for the high and other achievement comprehensive students. However, the same relations may not be present for the selective students.

For students located within the selective setting, prior Mathematics achievement was significantly linked to increased Mathematics buoyancy at Time 2, and to increased Parental pressure to achieve at Time 2. Whilst these relations were not significant for the high and other achievement comprehensive groups, the Wald test indicated that there was not sufficient evidence to conclude that the size of the paths representing these relations was significantly different across the three groups. For the selective sample, prior achievement in Mathematics was a significant negative predictor of later Anxiety, with the Wald test and subsequent pairwise comparisons indicating that the magnitude of this path was significantly different to the positive path found for the high and other achievement comprehensive groups. No significant reciprocal relations were found between either Parental Relations self-concept or Depression and Mathematics achievement, across any of the three student setting/achievement groupings.

In relation to the English as an achievement outcome, for the selective sample it was found that Time 1 Parental Relations self-concept, Parental pressure to achieve, and Teacher pressure to achieve, were significantly negatively related to Time 2 Spelling achievement. The Wald test and subsequent pairwise comparisons show that whilst the beta paths between these constructs were non-significant for the high achieving comprehensive students, the relations were also negative and not statistically different to the selective group. However, the beta paths in the selective sample were significantly different to the positive relations between these constructs found in the other achievement comprehensive sample. Also, there were no significant reciprocal relations found between English academic buoyancy, Anxiety, or Depression, and the Spelling and Sentence Comprehension outcomes.

Lastly, the post-hoc analyses of cultural background differences on select outcomes, as driven by the qualitative findings, produced some key results. Regardless of achievement level, non-Anglo students achieved significantly better results in Mathematics than did Anglo students at Time 1 and Time 2, however, they did not gain in Mathematics achievement over time. The reverse was found for Sentence Comprehension achievement—the non-Anglo students performed significantly worse than the Anglo students at Time 1 and Time 2, and again the gap in performance remained the same over time. The Wald test indicates that the strength of the beta paths representing the cultural differences was statistically

similar across groups. No difference between the two cultural groups was found for Spelling achievement at Time 1 or Time 2.

High achieving non-Anglo students reported similar Mathematics self-concepts to their Anglo peers at Time 1 and Time 2. However, for the lower achieving comprehensive school students, non-Anglo students reported significantly higher Mathematics self-concepts than Anglo heritage students. Whilst this difference was only found for the comprehensive students of a lower achievement level, the Wald test showed that there was not substantial evidence to conclude that this same process was not operating for the high achieving comprehensive students.

Conversely, non-Anglo students reported significantly lower self-concepts in English than did Anglo students at both time points. Again, the Wald chi-square test of parameter equalities demonstrated that the magnitude of the beta paths representing these effects were not significantly different across high and lower achievement groups. All students of a non-Anglo-background within the comprehensive setting, regardless of their achievement level, reported significantly worse Parental Relations self-concepts and significantly greater Pressure to achieve from parents than did students of an Anglo background at Time 1 and Time 2. Moreover, for the non-Anglo students, the amount of pressure they received from parents got worse over time, compared to the Anglo students.

This chapter has presented the major quantitative results that were the focus of Study 2. The next chapter now turns to a presentation of the qualitative findings pertaining to Study 3 of this thesis.

CHAPTER 8 RESULTS STUDY 3: A COMPARATIVE AND CONTRASTIVE QUALITATIVE INVESTIGATION UNCOVERING THE SCHOOL LIFE PERCEPTIONS AND EXPERIENCES OF HIGH ACHIEVING SELECTIVE AND COMPREHENSIVE STUDENTS OF DIFFERING LEVELS OF SELF-CONCEPT

Introduction

The two chapters presented previously reported on findings emanating from the quantitative data obtained within the present investigation. The purpose of the current chapter is to present the qualitative findings stemming from four focus group interviews conducted with high academic achievers from Year 10, located within one academically selective school and one mixed-achievement comprehensive school. Two focus groups per school were conducted, with all groups containing students who had obtained a high score in the Mathematics and English quantitative academic tests. However, students differed on the level of self-concept they reported in these domains. Specifically, the first group in each school was composed of students who reported a higher level of self-concept in Mathematics and English, whilst students in the second group reported a lower level of self-concept in Mathematics and English. It is important to note that at the outset, upon creation of these focus groups, the selective students reported lower self-concept levels overall, compared to the comprehensive students.

This chapter begins by describing the school life experiences of high achieving students located within the differing school settings: academically selective and mixed-achievement comprehensive. This chapter reveals the complexities involved in, and interplay between, school setting, high academic achievement, and differing levels of academic self-concept. It responds to the overarching research question: Do the school settings in which high achieving students are educated have differential effects on their achievement and wellbeing? The qualitative interviews were used to clarify the mechanisms underpinning and

explanations behind the quantitative results, thus enabling greater understanding of the data. The interviews also provided additional insights that were untapped in the quantitative component. Ultimately, it was intended that the qualitative data would serve to elaborate on, enhance, and extend the quantitative findings.

The following discussion of findings is presented in five overarching themes, with subthemes explained and explored in each. The first theme describes the students' relationships with their teachers and their perceptions of teaching quality, and identifies teacher engagement in learning as integral to student achievement. The second theme brings to light students' relationships with their parents, particularly perceived parental expectations to achieve academically at school and beyond. The third theme discusses students' self-perceptions of their achievement, their buoyancy in the Mathematics and English domains, and the nature of the school environment. The fourth theme illuminates the school life events that lead to students feeling bad or anxious about coming to school. The final theme presents students' broad-spectrum opinions about their school, and concludes with a positive focus on characteristics that students believe sets their school apart from others. Within each theme, the perspectives and constructions of students from the four groups are linked or contrasted as the data demands, to uncover the commonalities and differences between the groups in terms of their experiences of school life. It is not the case that each theme followed the same trajectory; in some instances, unexpected contrasts, such as those involving cultural differences, emerged.

The Pivotal Role of Teachers

The first major theme relates to the integral role of teachers. Research has consistently demonstrated that teachers are a major explanatory force in students' achievement. In fact, Hattie (2009) asserts that, second to the students' own contribution, it is the teacher who accounts for the greatest amount of variance in their achievement. More specifically, it is not just any teacher but rather the excellent teacher who holds the single most commanding impact on achievement (Hattie, 2009). When asked to identify positive attributes of their school, students interviewed across the four focus groups identified their teachers as a vital asset. All students spoke of the key role played by their teachers as an integral component in their learning, understanding, and achievement: "The teachers are really good at teaching. I think that helps us to learn better. You actually learn things at school; we

learn it thoroughly.” Teachers perceived as possessing excellent teaching qualities were viewed as highly supportive of students’ success at school, and as fostering this success by focusing “a lot on making sure the student does their best work”.

In talking about their teachers, all students identified the key qualities and attributes they believed defined “the excellent teacher”, and the particular strategies they employed to drive their learning and achievement. Whilst students from the academically selective school spoke of their teachers in a positive light, in terms of their possessing exceptional teaching qualities, the students from the comprehensive school highlighted the other side of teaching quality, explaining their experiences of teachers whom they perceived did not contribute so favourably to their learning and achievement. Each of these aspects is now discussed in turn.

The Markers of the Quality Teacher

When reflecting on their teachers, the students in this study all highlighted concrete, observable, and explainable qualities or practices displayed by their teachers that made them an asset integral to their school life. A myriad of attributes were identified across the four focus groups, but a common theme for students was that their teachers were dedicated to their success at school; students clearly saw this as holding positive implications for their achievement.

Thoroughness and knowledge. First, the commitment and dedication of their teachers towards their learning and understanding was identified via their thoroughness in teaching class material:

Our teachers are very dedicated. Because every piece of work we have, she gives us answers to them. She writes it all out and photocopies it for us. She is very thorough with that and she runs through everything and asks if you don't know anything.

Linked with this idea, teachers were identified as possessing a far-reaching knowledge of their subject area, thus encouraging students to develop a deep and comprehensive level of learning and understanding of the material taught, going beyond a surface level of learning: “My Maths teacher really knows his stuff. He usually asks us if say we want to learn more about some particular thing, and if we do, he does teach us it.” This depth of learning encouraged by the teachers was clearly valued for learning, as this comment shows: “Some teachers tend to skip over things that they think you should understand, but the teacher now really teaches it to you.”

Monitoring and evaluation. Discussion also centred upon identification of the excellent teacher as skilled at monitoring the progress of students and evaluating their level of understanding. The teachers were viewed as making an active effort to ensure that students knew and understood all content covered before moving to the next topic: “If we don't understand something, they come to us individually and work through the problem with us to make sure that we get what we're learning instead of just going onto the next thing.” This practice was viewed as having positive implications for understanding: “So you actually understand really well before you proceed. That's just really good. It's better for understanding.”

Class interaction. The use of class interaction by teachers was viewed as “always helpful”. The students clearly regarded teachers as figures who encouraged questions from students, promoted class discussions, and the sharing of ideas to enable a thorough and detailed coverage of the subject content. In doing so, the teachers served to enhance student engagement and learning:

My English teacher's really good, because she mostly has class discussions rather than just gets us to do the work. I think it's better because you not only have your own ideas, you have the rest of the class's ideas and that helps you a lot doing group work and stuff. Yeah, it's a lot better than doing work on your own.

Feedback. The provision of feedback was also recognised as a key characteristic of the quality teacher. Fast feedback on exams, where “we normally get them back in three to four days, the whole grade gets marked” was seen as vital to academic success, and contributed to the belief held amongst students that the teachers “put a lot of effort into what they do”. Moreover, feedback on classroom performance was also highly valued. Students across each educational setting appreciated directed and personal feedback on their understanding of content and the work produced in class. The following statement encapsulates these ideas:

My English teacher's really good—Mr X—he's the best English teacher I've had. Just the way he interacts with the students. It's just so much more than what the other teachers give. It's hard to explain. He like focuses a lot more on individual students. He focuses on everybody individually, instead of everybody as a group. So you get much more personal feedback instead of just general. So I find that much better. The personal focus.

The provision of exam and class feedback enabled students to know where they stood in respect to other students in the grade; this was critical knowledge for

the high achieving students. However, as will be seen later, it was this very feedback that became problematic for some students' self-concepts.

Interaction and engagement. Additionally, students emphasised the way in which their teachers interacted and engaged with them, and their style of teaching, served to define teachers as a fundamental aspect of their ability to achieve well. Students emphasised that those teachers who injected their own personality and character into their teaching, and made their classroom interactions with students fun and light-hearted, were able to strike the perfect balance of teaching the content required and captivating the students' interest and attention:

He's always making jokes and really lame ones sometimes, but it makes up his character. I don't know—that's how he teaches us. Not only does he do it in a kind of a fun way, he also teaches us maybe Year 11 or some extra-curricular stuff. So I guess it's really good for understanding future stuff.

This comment also reveals that the teachers often took students beyond their usual, or the required level of content, exposing them to challenging tasks and extended material from the higher grades. Thus, teachers were able to manage the balancing act between extending students in their work, and ensuring they understood the content and were not overloaded, so that the ultimate outcome was a positive one for the students.

Optimal learning environment. The value of the teacher's ability to create an optimal classroom climate, to enable learning and positive classroom interaction, was highlighted. The excellent teacher is able not only to foresee and prevent disturbances in the classroom, but to respond to students in a way that engages them in their learning:

My English teacher Mr X, he's a really good teacher. So in the boys' class we've got some rebels, if you know what I mean. Mr X is really good at teaching, and keeps them quiet, I don't know how he does it. But he keeps the class in order and it's still fun and they actually learn things. They actually do their assignments, they go well in their tests, and then yeah. So I think Mr X is a really good teacher.

Investment in learning. Finally, an integral aspect of teaching quality raised by the students interviewed, one that has served as the underpinning theme throughout all of the quotes presented thus far, centred upon the students' belief that when teachers were perceived as invested in students' learning, understanding, progress, and achievement, they were an integral component to students' academic

success at school. Consider how the following quote frames this investment in terms of a “mother figure”, comparing the teacher’s concern for their learning as equal to that of a parent:

They want us to do well. The way they talk to us and communicate to us. Ours gives a kind of a mother talk. Oh she treats us like we're her kids, like it's for your own future or for your own good: “I'm helping you and pretty much giving you all the answers but you need to do your homework.” It's like a mother talk.

Teacher Strategies to Enable Success

When asked to explain how they knew their teachers wanted them to do well at school, all students interviewed, irrespective of the educational setting, articulated various strategies and actions engaged in and offered by their teachers to help them achieve to their highest potential. Students interpreted the employment of such strategies as an indicator of their teachers’ engagement and vested interest in their achievement: “Our teachers want us to do better if you get a bad mark.” Interviewees explained that teachers were aware of and actively communicated to them when they believed they were not achieving to their potential, or had received a mark that was not up to their usual standard of performance: “They're like you're not doing as well as you can.” The teachers held high expectations for their students, and thus students were made directly aware of their teachers’ concern for their achievement. Their teachers subsequently encouraged them “to work harder”, and relayed to students that they would monitor their progress by “focusing on me for the rest of the year” in an effort to increase their performance and grades.

A common teaching strategy talked about by the students centred upon the provision of clear and direct instruction from teachers as to what would be assessed in upcoming exams and bookwork marks: “They give you information on how to pass a test.” This resulted in students feeling as though they were prepared for what the assessments would entail, and that they held a well-defined knowledge of what was required to attain good marks in the subject. Thus, the teacher’s actions ensured that the students could study as thoroughly as possible for their upcoming assessment. Consider this comment as illustrative:

They definitely want us to do well. Well, Mrs X, she's so dedicated. For our exams, she would go through every single thing. She will get out the syllabus and tell us to do the syllabus. She'll mark the syllabus in a few days and hand it back to us and see where we went wrong. She would, for our bookmark,

she would tell us: “This is in the bookmark, this is in the bookmark. I want you to get full marks because it's easy marks to get.”

The above statement that describes the timely and detailed feedback on exams links with the students’ discussion of teacher guidance in respect of approaching work. The students felt that their teachers “always encourage you maybe to change something to make you do better. They give you a lot of feedback that will help you in the future.” Specifically, teachers offered strategies to approach class work, assessments, and exams in different ways, in order to help students improve their learning and marks: “They will just offer advice if you're doing something slowly or they might give you a better way of doing it.” This was perceived as direct evidence of their investment in the students’ achievement.

The regular checking of book work from class (known as “bookmarks”), the involvement of parents when students were not achieving to their best, and extra time outside of class being offered by teachers to help students catch up with work or seek further information, were also highlighted as key strategies utilised by quality teachers to enable students’ potential:

Well teacher X is very strict about . . . things like bookmarks. If you don’t do well in them, then they call up your parents at times to let them know that you're not doing well and you need more practice with that subject so your parents can help you as well. Then they make you come to them at recess and lunchtimes until you catch up with all your work and that actually you know everything so far. So you're up to date with the rest of the class.

Across both school settings, the attention given outside of class was a common theme, with teachers often described as giving up their own time before and after class room hours: “My teacher lives two hours away from here and she gets to school at 7:00am and lets us go to her if we have anything we don't know. Early in the mornings, she's there to help every day.” The students believed that their teachers were committed to them well beyond regular school hours.

Ultimately, the strategies offered by teachers were clearly interpreted by students as indicators of their investment in them. Teachers were seen to hold high expectations for their students’ learning and achievement, were persistent in their encouragement of school and academic success, and continually engaged in helping them achieve to their full potential. The following comment sums up this dedication:

I reckon they put a lot of effort into what they do. Some people in my English class, they really don't bother trying. They come to class halfway through the

lesson and then in class they don't do anything at all. But our teacher still actually tries to help—to teach them.

The Other Side of Teaching Quality

A contrast between the students from the academically selective school and those from the mixed-achievement comprehensive school emerged when the comprehensive school interviewees spoke of their experiences with another side of teaching quality. Whereas the selective students only spoke of their teachers in a positive light, and identified them collectively as quality teachers, the comprehensive students outlined instances where they perceived some teachers as not contributing so positively to their learning and achievement. It is important to note here that teachers in selective schools face the same standards in employment selection as do teachers in schools that enrol students of all academic achievement levels.

For one comprehensive student, their loss of a position in the top Mathematics class and subsequent relegation to a lower class level was attributed to one teacher in particular. Her belief that the teacher had unfairly and inaccurately expected that she would have engaged in “coaching and tutoring outside of school and I would already know the work”, like other students in the class, was central to this perception. Based on this expectation, she felt that the work appropriate for her year level was considered assumed knowledge acquired at tutoring outside of school hours. Consequently, class work from the higher grades was taught, which she did not understand, ultimately leaving her feeling left behind:

Well there's like the lowest group, the middle group and the highest group [for Mathematics classes]. I got dropped from the top class . . . I blame the teacher. I would argue with him a lot, because I found that he would expect that I got coaching and tutoring outside of school and I would already know the work, because most of the other students did. I didn't know the work. He would give us Year 11 work and we're only in Year 9. I just really didn't like it.

The idea that just as a quality teacher impacts on learning and achievement, so too do teachers who are perceived as possessing less favourable teaching qualities, was further reinforced with the claim that “how well you do depends on what teacher you have”. Some teachers were identified as possessing more knowledge about certain subjects than other teachers. This was seen as subsequently influencing the students' levels of learning and knowledge of the content area: students perceived

their own knowledge as lower when taught by a teacher viewed as less proficient in the area. The following quote underscores this idea:

Most of the classes depend on what teacher you have, depending on how well you do. Some teachers aren't so good at teaching subjects that they teach, but they're good at teaching other subjects. So how well you do depends on what teacher you have more than the actual knowledge you have in the class. Just an example—one of the teachers at this school teaches Geography and Commerce and some other stuff, they're better at one subject than the other. They're probably better at geography than at commerce. So although they teach well at commerce, it isn't as well as some of the other commerce teachers. They just know more about it, so they can teach you a lot more about it because they've been teaching it for longer.

The importance of the teacher, in the perceptions of these high academic achievers, has been clearly established. As the next major theme demonstrates, there is another powerful player in the life and success of the high achieving student—the role of parents.

The Culturally Bound Influence of Parents

In presenting the perspectives of the students, as voiced by the students, as accurately and honestly as possible, it is important to be keenly aware of the dangers of stereotyping. However, for the purposes of clarity and consistency, a terminology was needed whereby to identify and refer to those cultural groupings identified by the students themselves. The term “Asian Australian students” will be used to refer to students who self-identify as being of Asian background, while the term “Anglo Australian students” will be used to denote students who self-identify as being of Anglo background.

The significant influence of parents on the school life of the high academically achieving students emerged as being culturally embedded and shaped; this was felt deeply by the students:

Basically because of our culture, they came here, they worked hard to get us into a good school. So they expect us to make use of that so it's basically the stereotype. If you have Asian parents, they push you harder generally than other students; like you see all these Asian coaching colleges and everything. So they put so much effort in.

It was an influence that centred upon a cultural difference recognised and communicated by students, between those who identified themselves and their parents as being of an Asian Australian background, and those from an Anglo

Australian background. This cultural divide was expressed in contrasting conditions for the students. Asian Australian students experienced immense pressure, where high achievement was perceived to be dismissed as merely expected, and students were pushed to meet their parents' unyielding, and at times impossible, academic standards: "Because they stereotype me as Asian, my parents [are] like, 'Lily that's not good enough, you're an Asian you can do better.' It's like you have to work harder to please them, because they've got different expectations and standards."

The fundamental reason for this is that these students felt they owed a great debt to their parents' struggles: "I know my dad and his sisters, they came here with a suitcase and \$200 and now they've got cars and houses and stuff. So they expect us to work as hard as they did to repay that." For students in the Anglo Australian cultural group, achievement was certainly encouraged, albeit in a less pressured way, and students' successes were actively praised. However, these students reported that their parents' expectations centred upon the notion that "my best effort is enough".

It is necessary to highlight that the academically selective school was composed almost entirely of students who identified themselves and their parents as coming from an Asian background, and the respective qualitative interview samples from the selective school wholly consisted of students of Asian heritage. The mixed-achievement comprehensive sample on the other hand, had an approximately even split between Asian Australian and Anglo Australian students, reflective of the larger comprehensive school cohort. Thus, whilst the perspectives of the Anglo Australian students are heard, the voices of the Asian Australian students predominate in the following sections. The defining features of this cultural contrast and their significant implications for the students, which crossed the boundary of educational setting and were identified irrespective of the school attended, are discussed in the following sections according to four indicative sub-themes.

"You Should be Doing Well" Versus "I Can See Your Hard Work"

For high achieving Asian Australian students, doing well at school was viewed merely as an expected outcome by their parents. The students felt that their parents were highly aware as to when their results or performance were not up to their parents' set academic standards, and that they were quick to communicate their disappointment with what they viewed as unacceptable failures. However, when students did attain the level of achievement their parents desired, they felt that their successes and accomplishments were neither recognised nor valued: "It's like they

notice downfalls more than they notice accomplishments. They rage when you do badly, but if you do well they just go, ‘Good job, okay.’” A shared belief for the Asian Australian students was the parental assumption of achievement, and the major absence of praise or commendation surrounding the students’ successes at school.

The following comment typifies such views:

Whenever I do badly in class, they are first to jump on and say: “You should have done better, you could have done better, you should work harder now.” Then when you do well, they are just like: “You should be doing well. You’re in the school.”

The perceived imbalance in parental recognition, where a “bad” result was always identified and a “good” result unacknowledged, led to Asian Australian students believing their achievement was never good enough. Even when they did exceptionally well in an assessment or exam, they were themselves reluctant to acknowledge and celebrate their own successes. Their academic self-concepts were clearly affected. What often resulted was a sense of guilt for performing well at school: “It’s like they make us feel bad when we do well. You should be doing better. So they affect us; when we get bad marks, we feel guilty as well.”

In contrast, for high achieving Anglo Australian students, these were less familiar parental ideals. These students spoke of an environment where doing well at school was promoted and poor performance was discouraged; however, expectations were couched in terms of degree of effort, rather than absolute standards. Their parents seemed to have a more balanced approach, and interpret their child’s results in terms of the students’ own standards, rather than any set expectations of their own. It was apparent that these parents were more likely to highlight the academic successes of their children: “If they’ve seen that I’ve been working hard and tried my best and I’m happy with my mark, they’re happy as well. But if I’m disappointed with my mark, they’ll be disappointed too.”

“You Must be the Best” Versus “Do the Best You Can”

Not only were Asian Australian students expected to do well, but further it was expected that they must perform better than their peers: “Your parents pressure you to do really well since they want you to be top of this top school.” Students clearly felt the weight of these expectations: “They expect good results. Like ninety per cent. They’ll always ask what the class average was and they’ll be angry if I don’t get ninety percent.” Similarly, increasingly greater achievement was stressed:

“They just want us to do really well. But then on top of that it’s like, say you get a mark that’s 80 something, then they say, ‘You could do better.’” The presumption of excelling at school and “topping” the class was common for the parents of Asian Australian students, one that was expressed in both the selective and comprehensive school settings, and for students of both self-concept levels. The heights these students were expected to reach, and the immense pressure felt in response, were clear: “It’s like, you’re going to have to do well, you’re going to have to get a 99 plus ATAR [Australian Tertiary Admission Rank for entry to university courses]. That’s the pressure. I know I have to get that.”

Intertwined with this, it is clear also that the Asian Australian students could consistently identify the set level of achievement they were required to meet, according to their parents’ prescribed standard of performance. These standards were often at the extreme end of achievement: “ninety percent”, “99 plus ATAR”, “top 10 percent”, or “first for everything”. Students spoke of how their parents set these standards, and also how they measured and interpreted their achievement and results in comparison to others: other students, the class average, the average of the grade, and report ranks, rather than the student’s own standards of work. The following statement illustrates such perspectives:

My parents look at the ranks the most in the reports and they don’t like me being an average student. They want me to be in the top 10 per cent of the grade and if I am in the lower half of the grade, then that’s not good.

The Asian Australian students felt that being an average student was not an acceptable option. Nor really, was being an excellent student, in terms of parental definitions of this term. The challenges, the stress, the pressure, and ultimately, the seeming impossibility of attaining such high results and “coming first for everything” were commonly acknowledged. Even though the academic achievements of these students were certainly among the best in the school and in the state, the feeling of never being “good enough” for their parents and the “frustration” surrounding this, were evident:

My parents put way more stress and pressure on me than my teachers. I’ll get a good mark—it’s good in comparison to the majority of people I know. My parents are like, “No, it’s not good enough”. It’s frustrating, because I think I’ve done well, and my parents just seem to disagree. My parents, they expect a lot of me. They want me to strive to be the best and all that. The best for them is first for everything, which is quite impossible.

Such feelings of inadequacy, against the impossibility of trying to be the best, were further compounded by the fact that these students attended two of the best performing schools in the state. The goal of reaching the top when there were so many other high achieving students in comparison, made an already high expectation seem even more unattainable. Yet parents were not seen to take this reality into account, or to adjust their expectations accordingly:

In other schools, it's easy to come top I guess. But here, your parents still have the same standard, but you can't get in the top as easily here and they say: "Why aren't you coming in the top ten?"

Ultimately, the conclusion expressed by Asian Australian students across all focus groups, was that the effort they had put in and the academic standing they had achieved did not matter to their parents. Even when the students themselves felt they had tried their best and were pleased with the results they obtained, they believed this was irrelevant to and ignored by, their parents. One student typifies this perception, where the only thing that is seen to matter for his parents is "the numbers on the report":

I have a feeling that, even if you do your best in class and you achieve a good mark for yourself, my report is actually not for me but to please my parents more than myself. Because I know how I did during the year, how I compared to others, but my parents want to see results, the numbers on the report. They can't see how much effort I've put in. It doesn't matter to them. It's hard, but you get used to it.

A very different picture emerged from the experiences relayed by the Anglo Australian students, who felt that there was no expectation from their parents that they must achieve at the top of their class or school. The students knew that their parents were clearly invested in their achievement and did not accept any "slacking off"; however, there was an absence of pressure to be the best. Rather, the students explained that their own best effort was put forth as the specific standard to be met. None of the students spoke of any particular "number" that must be reached. This expectation of "best effort" was viewed by the students as a reasonable and achievable goal. One student's comments are representative:

I find that my parents really only want me to do the best I can. So if they see that I'm slacking off, they'll be like "Ruby, what are you doing?" So my parents are pretty good that way, they don't pressure me to be like Little Miss Perfect and get top marks in everything because they know that in some things I just never will. So they're good that way.

“You Must be a Doctor” Versus “Do What Makes You Happy”

Another disparity between Asian Australian students and Anglo Australian students relates to the expectations their parents held for their future life and career beyond high school, and these were similar across school setting and differing levels of self-concept. For the Asian Australian students, these expectations centred upon parents’ valuing of the core, traditional subjects of Mathematics, English, and Science, and the perceived diminishment in estimation of domains that were artistic, creative, or simply deviated from traditional areas.

Asian Australian students talked about how their high achievement in non-traditional areas was ignored: “My father expects a lot from me in terms of Maths and in English, and Science, but subjects like Drama and BA, when I do well in that, he doesn't really notice.” Indeed, the following comment describes how one student’s parents would become angry if he did well in a non-traditional subject such as Physical Education, as his parents perceived that his focus was being drawn away from Mathematics:

If I do good in PE or something and I do bad at Maths, they get more pissed. They say: “Why are you doing so good at this subject and not this subject? You should be focusing more on that subject.”

The emphasis placed on not doing anything “arty” or creative was also reflected and extended in these students’ responses when they were asked whether their parents held any expectations for their career. Irrespective of school setting or level of self-concept, the Asian Australian students described the very specific career expectations communicated by their parents: “My mum's pressuring me to be a doctor”, “a doctor”, “same, a doctor”, “medicine or law”, “comm-law”, “they want me to do something in the medical field like a...doctor, or something that makes a decent living basically.” For these parents, the only career path option for these students was a “doctor, lawyer, all the smart jobs—the ones that have a lot of money and require a high ATAR or something”. Asian Australian parents were seen to disapprove of and discourage any consideration of alternative career paths:

Interviewer—Is there anything that you couldn't do, that they wouldn't like you to do?

Probably arts because they don't pay well. They just push you towards medicine and law because they pay well and they just want you to get a good job.

The motives underlying such parental expectations are linked to some of the background considerations presented at the beginning of this theme. The parents of these students had come to Australia with little more than “a suitcase and \$200”, and had worked extremely hard to build a life for themselves and their family. For parents, the only acceptable option for their children therefore was a high paying, high achieving, and well-respected career, and this in turn had implications for their academic expectations. Asian Australian students indicated that they held the perception that their parents holding such high hopes for their children’s careers showed that they believed they were capable of great things, and could secure positions as some of the brightest and most revered in the professional sphere. It was considered that their parents only wanted the best for their children.

In contrast, for Anglo Australian students, there was little prescription of a specific career path to be taken. It was apparent that these parents’ expectations rested upon the desire that their children be happy in whatever career path they chose: “My parents often ask me what I want to do when I’m older and I don’t have an answer because I don’t know, but they—whatever makes me happy they’ll be fine with that.” Indeed, it was not the case that these parents did not care what career path their child chose, or did not want them to be highly paid or well respected: rather, the emphasis was placed on personal fulfilment and on career satisfaction as well:

The really only expectations that my parents have upon my career choice is that I’m actually going to go out there and do something that I’ll enjoy for decades and not feel bored. They’re like, if you have a boring job, you won’t enjoy it so you need find something that will be challenging but enjoyable. They’re very supportive, which is good.

For these parents, they promoted and supported a career path that would be challenging, interesting, and enjoyable, whatever that path may be. Students felt free to choose a career they desired, and they saw this as a clear point of difference, in relation to the parental expectations communicated by the Asian Australian students. This student’s comment reflected this notion:

My parents are different; they just ask me what I want to do. I want to be an accountant, and they said “It would be good if you want to give it a try.” Then later I was like “No I don’t want to do it.” I don’t even know what I want to be right now, so I’ll just—whatever subjects I get into, I’ll just do it. They just want me to be interested in it. They want me to get a job that I’ll be happy to do. Doesn’t matter how much it pays.

The Push to Achieve

Students also detailed the expressions of their parents' expectations, their actions in response to a perceived poor result, and the methods they engaged, in order to push their children to a better result in the future. Again, there was evidence of a cultural distinction in these actions, with Asian Australian students relaying stricter conditions compared to Anglo Australian students. Related to this, the students themselves coped with and reacted differentially to these parental approaches. For some Asian Australian students these parental strategies were perceived as adaptive, as motivating them to try harder. For others, they had little effect. For others still, they were maladaptive and seemed to result in negative outcomes. It was apparent that these students' responses depended to some extent upon their perceptions of their academic abilities (i.e., their academic self-concepts). For the Anglo Australian students, their parents' more flexible, less goal-based approach was perceived to produce more adaptive and positive results.

Asian Australian selective setting students—higher self-concepts. One Asian Australian selective student from the higher self-concept group talked about how his parents reacted if he did not achieve a certain level, once again describing a demanding and goal-driven parental focus. He explained how his parents would ignore him for periods of time, and how he believed that this technique of isolation that had once spurred him to “do better”, now had little effect and had even become positive, in that he felt he was now spared from talking with his parents about his perceived failures:

My parents they just pick on all the bad things on the report and then they just ignore me for two weeks. It's like a cold period.

Interviewer—How does that affect you?

I think it's good because I don't have to talk. It used to affect me, trying to get me to do better, but now I just don't care anymore because it's grown old.

Another Asian Australian student, from the same interview group, also spoke of becoming resilient to the pressure from his parents to attain a better mark: “You just get used to it after a while.” Friends at school also acted as a buffer to this strong parental reaction: “If you get a bad mark, your friends usually try to cheer you up and motivate you and you get over it after a day or two.” He had developed his own way of avoiding parental confrontation, with an approach that was echoed amongst other Asian Australian high self-concept students: “I never ever tell my parents my worst

mark into my report because then I'm like, 'Oh how did I get this?' I try to hide it. But other subjects, if I do well, I tell my parents." For some, they responded to the parental pressure by working harder: "If they see you working hard, they're in a better mood." For these Asian Australian selective school students, it appeared that they were to some extent, shielded against their parents' pressure and strategies by their higher academic self-concepts. For them, parental pressure to achieve seemed to result in a middle of the road outcome. The students still achieved very highly, with the pressure from parents having little additional motivating effect.

Asian Australian mixed-achievement setting students—higher self-concepts. The most adaptive and positive outcomes resulting from parental pressure and strategies engaged by Asian Australian background parents were indicated by those comprehensive school students who possessed higher self-concepts. A common strategy used by parents was the administering of punishments and the removal of privileges such as pocket money. The following statement is illustrative:

They've got this way of making you just try harder and I'll be like [sighs]. But they've got all these advantages against you. It's like no pocket money and all that, so you'll want to try harder in order not to get punished or anything like that. It makes me work harder.

The outcome of these methods for this student was a motivating one: the pressure to do better made her feel obligated to increase her academic efforts and work harder in the future. This was a feeling also echoed by others within this group. In the face of an unacceptable result, it was commonly highlighted amongst these students that they would be confined to their rooms, made to work even longer hours on their schoolwork, and to study late into the night:

Interviewer—If you don't get the best in all subjects?

They push me harder. They make you work until late at night. I'm banned from going outside. I don't mind either—the pressure, because all the other people are striving to be doctors, you have to work more and harder.

This was seen as a constructive and encouraging strategy. If these students were to become doctors, in common with the aspirations of other students around them, they would need to feel the pressure to work longer and harder. Seemingly, possessing good beliefs about their academic abilities enabled these comprehensive school students to harness their parents' expectations and pressures in a positive way.

Analysis of these parental strategies used reveals that also, they amounted to challenging or even negating students' autonomy as learners. Students were required to work and study exceptionally hard, and this was driven predominantly by parents rather than the students themselves:

My Mum makes you do lots of studying. For example, the Maths test we had period three, she was making me study from two weeks before the exam because we got the notice of it a lot earlier. It's just a lot of extra effort on top of my schoolwork.

Students were pushed by their parents to do extra work on top of their allotted class and homework. Tutoring outside of school was also widespread for the majority of these students, with most reporting that they were sent to two to four hours of coaching per week. One student relayed how his parents would "hassle" him with extra work if he received what they thought was a bad mark. He spoke of his parents' negative labelling of him as a "bludger" because he did not attend any coaching or tutoring classes outside of school, unlike everyone else:

They always go through your work and ask if I'm doing well. About coaching: "How come everyone else is going to coaching and you're not? Everyone else's parents—their kids are all going to coaching for all their subjects and you're just bludging."

Asian Australian selective and mixed-achievement setting students—lower self-concepts. For those students who reported possessing lower perceptions of their own academic abilities, regardless of the educational setting, the parental strategy of applying immense pressure was reported to be maladaptive, doing little to motivate students to try harder:

Interviewer—How do you handle it, these expectations that your parents have?

Student 1—Lock yourself in your room.

Student 2—You shout at them.

One method employed by these students was the hiding of marks and results, to avoid parental confrontation: "I'd usually try and hide my results from my parents until the end", "I hope that my overall mark outweighs the test, if you average it, it's usually ok", and "You just tell them the good ones." For students who were high academic achievers and who already felt poorly about their own abilities, the high pressure from the expectations of their parents, and the resultant strategies used to push them harder, clearly affected them: "I guess we're all worried about what our

parents think.” Moreover, that common feeling of not being good enough despite their high achievements was ever apparent. One student summed up this experience: “Sometimes, even though the high expectations push you more, sometimes it feels like you’re not doing your best and it makes you feel kind of degraded.”

Anglo Australian students. For the Anglo Australian students across both self-concept groupings, there was little reference to parents pressuring them to attain better marks, and they were seen to utilise less demanding strategies to encourage them to work: “My parents are more like, if I’ve got a lot of work to do, they’ll suggest maybe don’t go out this weekend, and go out the next weekend. But they won’t force me to stay.” This approach of suggesting, of guiding but not seeking to instruct, was a consistent theme, expressing the perception that whilst their parents were obviously invested in their achievement and progress, they operated from a less challenging platform:

There is some pressure, but it’s not a daily thing—it’s not constant. They’ll just check up on me every few weeks or so, just to say: “Are you catching up with school, are you falling behind or anything?”

The idea was not that these Anglo Australian parents were uninvolved or lacked concern, but rather that the students’ best effort was encouraged. If the Anglo Australian parents perceived a lack of effort, there would be appropriate consequences, including social restrictions. Students would also be encouraged to spend time reviewing their errors and to focus on ways of improving in the future. Ultimately, the feeling shared by these students in response to their parents’ less exacting approach, and focus on effort rather than results, was positive and adaptive for students of all self-concept levels:

As long as I try my hardest, then my parents are really good. But then if I didn’t, they will ground me and won’t let me go out. They wouldn’t let me do as much stuff. Then I’ll try to get better marks and then I can go out again. Just go back and see what I’ve done wrong, and then try to improve and find a better strategy to how I will understand more, then I know I’ll get a better mark.

At this point, it is worth noting that the emerging themes in respect to Asian Australian students are playing out along racial stereotypes. As a researcher, I am acutely aware of this. However, it is the case that this is what the students within this sample, and therefore the data, are saying. It must also be considered that as highlighted at the outset of this theme, the majority of this sample was comprised of

Asian Australian students, with a limited voice of Anglo Australian students represented. These issues will be raised and covered in much more detail in the Discussion, however, it was felt necessary to flag acknowledgement of them here.

This section has clearly demonstrated the cultural interplay of parental influence across both academically selective and mixed-achievement comprehensive school settings, for these high academically achieving students. The following main theme turns to the students' own influence in and contributions to their school life.

The Students: Academic Self-Concept, Academic Buoyancy, and Class and School Competition

Having considered the significant influence of teachers and parents in the school life of high achieving students, this third main theme explores the students' own contributions to their achievement. Specifically, the students' evaluations of their achievements and buoyancy in the Mathematics and English domains, the differing ways in which they constructed their achievements in these domains, and the competitive nature of the class and school environment and its resultant effects are discussed, compared, and contrasted across the four focus groups. What emerges is that the interwoven variables of cultural background, school setting, and prior academic self-concept levels play a critical role in shaping students' beliefs and experiences.

Culturally Produced Perceptions of Mathematics and English

When high achieving students were asked to explicitly evaluate and make a judgement upon their academic performance, specifically in the Mathematics and English domains, a very complex and multilayered story developed. The first layer involved a cultural aspect to perceptions of academic performance, which was highlighted across the differing school settings and self-concept groupings. For Asian Australian students within the mixed-achievement environment, and all students within the selective environment (interviewees were all of an Asian Australian background), the shared view held was that Mathematics was objective and English was subjective. In this way, the students felt that whilst their Mathematics achievement was something they could control, their English performance was out of their hands:

I think English; I'm not doing so well at. I don't really want to do English anymore. I can't really—because I don't really know how to do well in

English. I can't study like I do in Maths. In Maths there's certain answers that are always correct and there're answers that always wrong, but in English it depends on what your teacher thinks is right or wrong or what you think is right or wrong. It's more subjective. So I find that a lot harder than other subjects.

The common perception communicated by these students was the belief that Mathematics could be studied for; there was always a concrete “right or wrong” answer: “Maths is precise in terms of there's only one answer and, if you get it right, you get a tick; if you get it wrong, it's a cross.” Thus, Asian Australian students seemed to view their performance in this domain as internally regulated; controlled by their own actions and efforts. Conversely, English was regarded as a subject that contained many variables and a myriad of potential answers: “English is more of a—you wing it and see how you go. It's all the teachers' marking I think, or what they like.” The consensus was that due to the multitude of potential responses that could be developed, English performance was externally regulated; controlled by factors external to the student, such as differing teacher expectations, or different marking standards. In a way, it was the “luck of the draw” as to whether students did well or not. Whilst Mathematics was certain, independent, and black and white, English was uncertain, dependent, and full of grey areas. The overwhelming thought was that they did not know, and of course could not know, the single response that would be correct, as English allows for a multitude of differing interpretations. The following interaction between two students reflects this perception:

Student 1—For English, there's no set answer. You don't have something to go off. Like with Maths there's an actual answer so you know you got it right or wrong. In English it's just . . . random.

Student 2—There's better and not as good. Not right or wrong. I'm just not very good at it.

Such ideas were held most strongly within the selective school. Kate, a teacher at the selective school, talked about how she believed that the cultural background of students moulded their constructions of Mathematics and English. In my research diary I noted an exchange shared on the first day of testing at the school, which cemented this theme:

While waiting for the students to enter the hall for testing today, I was having a chat with a teacher called Kate. She relayed to me that all the students were “a bit nervous” about the English component of the testing to be done today. Not only that, but some parents had also expressed concern about today's

testing, again, particularly with the English aspect. Kate said “We are known as the Mathematics school, the arithmetic school.” She explained that the students and parents alike were more comfortable with Mathematics testing as it was something they had been “studying and training for all their life”. Coaching and tutoring in Mathematics was commonplace amongst the students. Kate said the nervousness surrounding the English testing centred upon the idea expressed by students and their parents that Mathematics was something you could study for, and English was not. This, she believed, was “a cultural thing”. Numbers in Mathematics were concrete, the answers were set, but “give them anything where they need to be creative, like spontaneously generate a story—they get really anxious, they can fall down.” I asked her what “fall down meant”, thinking that this was one of the top performing schools in NSW. Kate explained that high nineties was the norm for Mathematics, and lower nineties the norm for English. (27th January, 2009)

Moreover, it was apparent that the selective school itself seemed to very much encourage this focus on Mathematics achievement, being widely known as “the arithmetic school”. Consider how, in the following quote, teachers were geared toward success in Mathematics:

Interviewer—Can you tell me the best thing about your school?
 Maths. We're ahead of the other schools by a lot. The teachers are really thorough with it so we learn a lot and there are a lot of past papers we get to do before we do the actual exam.

The fundamental outcome of these differing perceptions was that students, and particularly those in the selective setting, seemed to value Mathematics, and therefore their academic achievements in this area, to a much greater extent than English: “We want to do well in English but we don't value the mark. Maths is the Holy Grail.” Furthermore, the Asian Australian students' evaluations of their academic performance, their academic self-concepts, were inevitably and inextricably affected by these contrasting conceptualisations of the Mathematics and English domains. As will be seen below, students were able to assess and voice their evaluations of their performance in Mathematics clearly, whether it was positive or negative. Perceptions of competency in English were, however, regularly questioned and were often surrounded by uncertainty. As one student captured: “In Maths, there's like a set group of people, they're good at Maths. But in English, we don't know because it changes all of the time.” All Asian Australian students overwhelmingly expressed a lack of confidence and insecurity in their abilities in the English domain.

Student Academic Self-Perceptions

Intersecting with the issue of culture, the next layers that shape these high achieving students' academic self-perceptions were the educational settings in which they were located, and the prior levels of self-concept reported.

Selective setting students—higher self-concepts. For students within the selective school environment who had reported higher self-concept levels, a very consistent picture emerged. When evaluating their Mathematics abilities, these students were reluctant to identify their current high standing and significant achievements, and consistently downplayed their immense abilities: "In Maths, I'm just like on this level. It's so hard to get up because everybody's trying really hard because it's Maths. I think I should try harder." Clearly, these students held exceptionally high expectations for their achievements in Mathematics, and evaluated their performance against such standards: "Well Maths, I think I'm doing okay. I'm not at the top but I should be able to get there . . . everyone wants to get to the top class in Maths but there's only a limited amount of places."

As highlighted by the above comments, this hesitancy to acknowledge Mathematics capability amongst these students, who were some of the top performing students in the school and in fact in the state, appeared to stem from the comparison of their own performance to the performance of their surrounding peers. There were so many other students achieving just as well, and even better, that students felt little security in their current academic standing. Consider one selective student's comment, which sums up this idea of close competition in the selective setting, and the negative impact of comparison with other highly achieving peers on academic self-concept: "I'm not confident in Maths because the marks are so close. A half mark or one mark can place us."

In terms of evaluations of their English achievements, the higher self-concept selective students' statements were reflective of the perceived subjectivity of English. It was exceedingly common for students to interpret this subjectivity in terms of differing teacher standards. The students collectively expressed that the outcome of this was often inconsistent results, and a self-assessment of "pretty low marks". Ambiguity also underlined this group's academic self-evaluations in English: "You never know. In English, I've been going up and down every year." This perception of poorer performance was held even though these students were attaining marks above 90 percent, as previously highlighted by teacher Kate. In the

following quote, perceived inconsistencies in and issues with coming to grips with successful English achievement are articulated:

With English, it's definitely different for all teachers. It's really subjective. An example is, there was this assignment and it said "write a paragraph", so I wrote a paragraph. Then I got pretty low marks. I asked why and she said "Well, everyone else wrote a page so you just didn't write enough." But some teachers, if you go over the word limit or something, they say "No, too lengthy, not concise." So they mark you down.

The following exchange between two students and myself, exemplified the academic self-concepts of selective students with self-reported higher self-concepts. Successful English achievement was perceived as externally controlled, and consequently the students did not evaluate their performance highly in this domain. Conversely, whilst Mathematics performance was believed to be controlled by effort and practice, these students still did not hold positive perceptions of their academic standing in this area. In comparing their Mathematics results to their peers, there was little difference in marks across the year, creating close competition and pressure to stay at the top:

Student 1—I find that you can't really study for English. You can't just say "I want to do better in English" and just study for it and then do better. Not like Maths. You just try to get along well with the teachers, like suck up to them. Maths is just okay for me. I just stay where I am.

Interviewer—*You're in the top Maths class though, right? So you should feel pretty good about yourself?*

Student 1—It's not that much of an ego boost. It's just expected.

Student 2—But you came first this year, and this test.

Student 1—It was by half a mark. So it's very, very close and it's pressure to do well.

Selective setting students—lower self-concepts. For the lower self-concept students within the academically selective environment, an overwhelmingly poor perception of their skills in both Mathematics and English was shared: "No I'm not doing too well for Maths. English is worse. It's too hard. I think we lack creativity." Not only did these Asian Australian students interpret their perceived poor abilities in English in relation to external factors, but they also expressed a similarly poor self-concept in Mathematics: "I think with English, because my teacher doesn't really like the way that I write, my style of writing, I don't get as good marks. But with Maths I've always been pretty bad at it." A collective feeling amongst this group of students was also that they had low expectations for their own achievement, even

though they were some of the best academic performers in the school: “My standards aren't that high. Just average or above is fine for me.” Similarly, another student too spoke of feeling like she had always done “pretty badly”, and how this poor perception had shaped her academic beliefs: “My expectations aren't too high because I've always done pretty badly.”

A clear lack of confidence in their own abilities was expressed by these lower self-concept selective students, together with an inability or unwillingness to recognise their achievements. In comparison to the higher self-concept selective students, the surrounding schooling environment with many other high achievers, and specifically the comparison with these other students, appears to have shaped these feelings. Thus, an otherwise excellent result could be seen to be poor when compared to even higher results:

Interviewer—I'm just thinking you guys are probably the brightest students in the state. Your achievement is pretty great, you realise that don't you?

But then again when you compare it to other people, there are people who get full marks and then get high distinction. Then if you get a distinction you feel pretty bad.

Mixed-achievement setting students—higher self-concepts. The high achieving students located within the comprehensive school environment that reported possessing higher academic self-concepts, voiced high expectancies for their own achievement. The students evaluated their academic standing in terms of their own standards, alongside those of their parents, and communicated largely positive perceptions about their attainments and successes in Mathematics and English:

I guess by my standards, I think I'm doing okay. Because my parents' standards are kind of high, I expect a lot of myself, but I think I'm doing well.

Interviewer—Is there a specific mark that you think I have to get this in Math and English?

At least 90 per cent. Because of my parents.

Interviewer—Are you getting at least 90 percent all the time?

Yeah, most of the time. Yeah, majority.

A clear contrast between the differing educational settings in terms of academic self-concept formation was evident; the students in the mixed-achievement environment did not evaluate their academic capabilities with the same standards of reference as those in the selective setting. The selective students were surrounded by peers who were only high achievers, and this close competition as a tool for

evaluation ultimately resulted in low perceptions of their capabilities. Conversely, the students in the mixed-achievement setting did not talk of the same intensity of competition and closeness of marks, and rather utilised their own standards to evaluate their academic performance. The outcome of this was a more positive academic self-concept. The general consensus amongst this group was that “I think I'm doing well this year”. This group of students was able to recognise their significant achievements in the Mathematics and English domains, and were able to voice these positive self-perceptions:

I felt because my English teacher is so good that my essay writing has just gone way up. It's much better than it was last year and I'm very happy with that. With Maths, I'm more comfortable this year so again I'm doing better. My teacher was happy with my marks, so that made me feel better about it as well.

The cultural aspect of perceptions of academic performance, particularly in relation to English, was again highlighted for the comprehensive students. Take, for example, two Asian Australian students within this higher-self-concept group, who evidently had expressed confidence in their abilities in Mathematics: “My Maths has been consistent. I try to strive for the best. Two or more wrong is fail”, and “I think I've definitely improved for Maths.” However, both held less positive perceptions of and questioned their abilities in English: “My English is not that great, or it's not that good. It's just over average. I had to do a lot of—I have to self-discipline myself to strive for more”, and “English, I'm not doing as well as I did last year. But then I'm still getting tutored, so that's okay.”

Mixed-achievement setting students—lower self-concepts. Similarly, in the lower academic self-concept comprehensive student group, this apparent cultural perception of relatively poor English performance was reinforced as a shared experience. These Australian Asian students consistently identified a poorer perception of their abilities in English, compared to Mathematics: “Maths is ok. English is bad. I'm in ESL.” Furthermore, and in general terms, the possession of a lower academic self-concept appeared to affect the self-perceptions of Mathematics and English ability expressed by the comprehensive students overall. Here, a very mixed perception of achievement was discussed, with students speaking of their achievement in terms of “good”, “ok”, and “average” performances. The following student comment encapsulates this confidence in Mathematics at a personal and

grade level, combined with a perceived lack of ability with the techniques required for understanding of English content:

For myself, I think I'm doing pretty good in Maths...for my grade, I'm pretty good. But in English I'm not doing so well. I dropped a couple of classes from last year, because I just had trouble getting all the techniques and stuff that are related to poetry and Shakespeare and all that. I don't really get that.

It was apparent that this group too held great expectations for their own achievement, and often felt that they weren't quite reaching those standards, even though they were amongst the highest academic achievers in the school:

Well my Maths marks, I think I'm doing averagely well in that. But English I don't really try, because I don't really like English that much.

What's average for you?

Around 80 per cent.

Consider the exchange below between two top-performing students in the school, reflecting on what they perceived as their poor performance in a Mathematics test conducted just prior to the interview. It seemed that the students in this lower self-concept mixed-achievement group were hesitant to recognise the very high level they were achieving at, and were often underestimating their attainments. Most appeared to focus on the few "mistakes" made or on marks lost:

Student 1—We failed our test today. It was really hard. Yeah, it took so much time to get through it. It was confusing. I think just a really big problem is careless mistakes.

Student 2—I see that with me, I see that with me and I don't read the questions.

Student 3—Yeah, we were discussing about the Maths test at lunch—a friend and I got really stressed about all the mistakes we think we made.

This lowered perception of their academic achievements was reinforced by a student who had come first in the grade for Mathematics; she clearly undervalued her achievements when describing how she felt about her performance in Mathematics: "Maths is ok."

Student Academic Buoyancy

In the face of a bad Mathematics or English mark, the high achieving students within three of the four focus group settings spoke of being largely resilient and robust. Specifically, the students from the mixed-achievement school, irrespective of the academic self-perceptions they held, and the higher self-concept selective students, were buoyant, motivated, disciplined, and committed to doing better and

“trying harder” for themselves: “I try to strive for the best...I had to do a lot of—I have to self-discipline myself to strive for more.” In response to a result that they believed did not meet their set standard, these students consistently spoke of improving their performance. They communicated actions such as: “finding a better strategy to how I will understand more”, checking homework, reviewing assessments to identify and correct mistakes, “doing more past papers”, and “studying the topic more” in order to achieve this. The comment below, where a student describes how, in reaction to dropping exam marks, he felt driven to “push it back up” is a typical example of the buoyancy highlighted by these students:

My exam marks have been, sorry, they have been dropping since, I would say, midway last year. I'm trying to push it back up, but I think I'll have to study more, check my homework. Because I know that's my weakness and I know that's why I'm getting a bad mark. When I do something wrong, I try to go back and see what I can do better and what I have been doing and I try and find the solution.

Interestingly too, even though the Asian Australian students from these groups had similarly and consistently expressed the beliefs that you “can't really study for English” or that “I don't really know how to do well in English” they still spoke of a desire to improve in this domain:

In terms of English, I'm an overseas student. I came here when I was 10 with my uncle. So my English skills are not really that high. I just try to read more books, try to learn more.

Their perceptions of English were ever apparent, with the expressions of buoyancy in this academic domain clearly and inextricably tied to their views of subjectivity: “In English, if I get a bad mark, it just means that the teacher doesn't like you or is too picky. In Maths, you just look over all your mistakes and just try not to make them next time.” It was clear that these Asian Australian students felt that there were set and tangible strategies that could be employed to improve in Mathematics. However, efforts required in English were less clear and were focused on working out “what the teacher likes”. As one student explained:

In English, usually the teacher writes comments. I ask them and try to improve on that. So you get a feeling of what the teacher likes. Maths, I just studied the topic more and I get my dad to tutor me.

Juxtaposed with this picture of buoyancy, as necessarily associated with at times unclear teacher expectations, a different image emerged for the lower self-

concept students situated within the selective school environment. This group seemed to lack the drive to bounce back after a perceived bad result: “I’m pretty sure I can do better if I wanted to but I’m not trying either because I can’t be bothered right now”. Similarly, another student expressed that in response to a bad mark, he did “nothing much” to attempt to better his achievements in the future. A few within this group spoke of engaging in such practices as cramming immediately before exams, rather than making a sustained effort throughout the term: “Yes it’s like normally you don’t do anything, but a few days before the exam you just fully work and cram everything in and after the exams you just go back to not doing anything again.”

For the lower self-concept selective students, it seemed they were resigned to their current standing within the grade, and felt they could do little to improve their marks for the future due to the very close academic competition within the school. They felt like: “We know who the smart kids are, so we just don’t try to get there.” This portrait of buoyancy was ultimately linked to the poor academic self-perceptions these students held, despite their current academic success within the selective school, they also held negative beliefs regarding their ability to bounce back after receiving a lower than desired mark.

Comparison and Competition

It is clear from the above discussion that the presence of student comparison, and a competitive school environment, was intertwined with the high achieving students’ perceptions of their school life and impacted their self-concepts and resilience. These variables were highlighted across the academically selective and mixed-achievement comprehensive educational settings. However, the nature and characteristics of the comparison and competitive milieu, and their resultant influences on the students were experienced differentially across the school environments.

The landscape of the academically selective setting is characterised by intense student comparison and competition: “There are high expectations. There’s a competitive nature when we do our work.” Being one of the top performing schools in the state, few marks separated those placed first in the grade from those placed at the bottom: “Sometimes when you get a bad exam mark, it’s not necessarily your fault. You could have just screwed up one or two questions; so it happens sometimes.” It was literally the case that one or two marks could differentiate these

students, and this created an intense academic environment: “Well, there’s more pressure than usual at this school because everyone’s so smart. So even if you try your best sometimes you actually don’t do that well.”

The selective students also talked about the pressure surrounding the ranking of students into classes based on achievement level, and the additional possibility of being “dropped down” into a lower level class based on performance. With marks already so close, rankings added to the competitive element of the school. In the discussion below between two selective students, what began to surface was how the competitive environment contributed to the students’ beliefs and feelings about their academic standing and performance:

Well, we get ranked in Maths. We have five classes: A, B, C, D, E. Obviously, A is the top class . . . if you get put into a lower Maths class, sometimes it has an impact on your self-esteem. E for embarrassment.

It seemed that the strong presence of comparison and competition was the underpinning of the academic self-perceptions of the selective students, who were all reluctant to recognise their abilities, and/or possessed lowered beliefs in their abilities, despite their high academic standing. The immense closeness in marks appeared to underlie and shape the hesitancy of these high achievers to acknowledge and value their academic achievements: “If you were in the top class and you did worse than everyone else, even though you’re beating people in the lower classes, it’s still going to affect your self-esteem a lot. It’s a lot of pressure, I guess.”

The selective students themselves vacillated between the positives and negatives of the inherently competitive nature of the school, and whether or not they viewed it ultimately as an adaptive or maladaptive force in their school life. Competition was seen as most beneficial for those students who achieved at the top of the school, and maintained that position: “Competitiveness can be good or bad. It can be bad if there’s too much. If you do well and then you do bad, then that’s very bad. Not everyone can come in the top.” Class membership could also be seen as a double-edged sword—as a negative source of embarrassment or as a positive motivational force:

I guess it is kind of embarrassing and some people take it as in: “Oh my God, I’m never going to do well.” They just lose hope in Maths or they just don’t do it at all. But otherwise, it does motivate you sometimes because if you say, “I’m in A” it’s like, “Oh my God, wow.”

Furthermore, the “ranks on our reports” could work either way, and depended on the students’ relative standing to their peers in the same year group:

You kind of try and be in like the top 25 or something. Sometimes you might want to work harder to improve it. But then if you do badly then you kind of give up and just let it slide and you just get worse and worse on the subject.

Some of the selective students who had previously reported higher-self-concept levels identified a positive side of their membership of the top Mathematics class. Two students talked about the highly competitive and immensely fast-paced atmosphere of this class, where they “race to finish questions quickly”, and how they saw such intensity as adaptive:

Student 1—It's more fun to be in the class where you can all move at the same level.

Student 2—It's really competitive though.

Student 3—We race to finish questions quickly. Then he checks if you're right. It's really intense. It's good fun.

Student 1—Because the people in there like Maths.

Student 3—Yeah, everyone likes Maths in that class and they all do work at the same level so we can move on very quickly.

This group of selective students with higher self-concepts clearly acknowledged the very high capabilities of their peers, and interpreted being surrounded by such well performing others as inspiring: “It's scary being surrounded by so many bright students. It's quite inspiring because there's people that are just so smart. You want to just be like them I suppose.” It seems that these students’ own high achievements, coupled with their positive perceptions about their own academic capabilities, meant that the high achieving level of the school and wider student body was positioned as a favourable, motivating influence: “They motivate you to learn more because they push you up and if you see your friends doing well, you want to do well as well. So you do well.” Extending on this idea, the higher self-concept selective students seemed quite protective and supportive of each other, constantly valuing and upholding the achievements of their classmates:

Although we compare marks and stuff, it's not really an in your face thing. You just know who gets bad and know who gets good and you just leave it at that. They are your friends after all so you don't want to make them feel bad or guilty or putting pressure on anyone unnecessarily.

Even though both selective setting self-concept groupings seemed to move back and forth between the advantages and disadvantages of the competitive school

environment, the overwhelming view from the lower self-concept selective students was that it was potentially maladaptive for their academic self-concepts and buoyancy: “There are some people who, you know no matter how hard you try, you probably will never beat.” The mechanisms underlying, and the resultant effect of this belief, were explained thus: “Because even if you're near the bottom in a great school it makes you feel bad because compared to the rest of the school you're not doing as good as everyone else.” Even though they were still achieving high academic results, the confidence of this group of students was clearly affected by the intensely competitive environment. In the discussion below, lower self-concept selective students imagined they would feel a greater confidence about their achievements if they attended another school with a greater mix of achievement levels to compare their own academic standing to:

Interviewer—If you were a student at another school, not this school but another local school, how do you think you might feel about your achievements then?

Student 1—I'd feel overconfident.

Yes. (Everyone)

Student 1—Like if you get top in another school then you'd be like I'm so good and pro.

Student 2—Then you might start getting lazy.

Student 1—Yes. But then even if you're lazy you'd go, “I'm still really good”.

Student support again proved a positive, acting as a buffer in the competitive selective environment, as students were still attaining exceptional academic results:

You compare it to your friends and they go, “Oh you did better than me or I did better than you”, and then you kind of try to make them feel better while making yourself feel better as well. If you both did bad then it's like “Yes it's only this year, it's only Year 10.”

Within the mixed-achievement environment, all of the high achieving students also spoke of this sense of a competitive environment at school: “The competition, there's lots of smart people.” This atmosphere of comparison and competition however, looked much less pressurised than that experienced by the selective students, due to the greater diversity in achievement levels amongst the students. Despite this, it was openly acknowledged that there were many other students achieving outstanding results. This was ultimately seen as a positive, adaptive, and motivating force:

Everyone's trying much harder now. In Year 7, I came first in English in the whole grade and I was like "Okay, I'm really good at English." But then, everyone caught up and started getting better than me. I was like "Oh I've got to work harder now."

Another student similarly spoke of the wider academic environment at the comprehensive school containing many other high achievers. She clearly interpreted her own academic standing in relation to her peers, and this encouraged her to improve on her own academic efforts.

Because you see your friends and you'd be like: "Whoa, they did so well", and then you think what they're going to do in the future and then you compare yourself. You'd be like "Where will I be?" So then you'll try harder. I try to do better.

For the students in the mixed-achievement setting, the nature of the competitive atmosphere within the school was less intense than in the selective setting, and this meant that it often motivated them to improve. In contrast, the competitive environment of the selective school was much more concentrated, such that the outcome was potentially maladaptive for self-concept, motivation, and buoyancy for some students. Particularly, those selective high achievers who had positive self-concepts tended to display the most resilience to the competitive school environment.

Again, the theme of buffering that emerged in the selective school context is evident, in that the competitive environment of the comprehensive school was cushioned by the presence of other students of lower achievement levels. This appeared to lessen the potential impact of the high achieving "others" in comparison, as mixed-achievement setting students were also able to interpret their achievements in light of the students they were outperforming:

I was in the highest Maths class last year and I've been dropped down, which I can understand. Last year there were some topics that I didn't really understand. So I'd be looking at my mark and I'd be in the lower half of the good marks. I'd be like "Oh that's not too good." But this year I'm sitting and I'm comparing marks with my classmates and I'm starting to get higher marks and even with certain tests, there was a non-calculator test, I got like 23 out of 25 or something. Whereas there were some other people in higher classes getting 20 or lower, so I was kind of like "Oh that's pretty cool."

This protective effect of the mixed-achievement setting, which seemed to provide these high achieving students some relief in the presence of fierce

competition, was further reinforced. One student outlines how he feels that competition with other, similarly high achieving peers results in a negative impact on his academic results, whilst the ability to compare his achievements in relation to other, less achieving peers increases his success: “Personally I reckon I do better when I’m not competing against others. I do better if I’m just in a normal classroom with mixed-ability.”

A complex picture of the interaction between the high achieving students’ academic self-concepts, academic buoyancy, and the school environment has been drawn. In the next section, students’ anxieties, and their accounts of certain times when they felt bad about school, are highlighted.

School Life Anxieties and Difficulties

The fourth main theme covers students’ experiences of anxiety and difficulty at school. The high achieving students communicated similar instances surrounding when they felt bad, or when they were worried about attending school, across the differing educational settings. Again, however, academically selective students reported a greater intensity in such experience.

Exam Day Pressure

Selective setting students. Exam days were seen as a major source of anxiety for the selective students: “On exam day, it’s kind of nerve wracking and everybody’s nervous. So there’s this nervous atmosphere.” Particularly in this educational setting, the atmosphere at assessment time was intense, even resulting in some students crying and physically shaking from worry and nerves. The students were principally concerned with the fact that their result on the test would be ranked and compared to other students in their grade:

I remember Year 9 yearly was our first test to get ranked and before that test, my hands were completely sweaty. Everybody was like, “Oh my God, oh my God.” It was so scary. People were crying after. My hands were shaking when I just started and then my pen kept slipping as well. It was so scary.

Clearly, the pressure to do well felt by these selective students—coming from themselves, their parents; in relation to their peers, and the wider school—was intense. Such pressure culminated in a state of extremely heightened emotion amongst the students at exam time. This stressful atmosphere was amplified by the practice of comparison with other students. Some were seen as being able to

“Regurgitate the whole text book word for word and that makes you feel really bad because they're just like walking around reciting what everything means just before a test. It's like, how can you compete with that?” This practice, and the implication that it made some students feel less academically capable compared to their classmates, seemed to undermine the little confidence these students had, and fed into the growing stress and worry. Appreciate how, in the following quote, selective students entered the exam room feeling “extremely, extremely stressed” and like they lacked the knowledge required to succeed, due to explicit comparisons with other students:

Sometimes when you're at home you feel “Yeah, I'm pretty good.” Then you go to school and everyone's revising and it makes you feel extremely, extremely stressed. Like everyone else is cramming so hard, like even the smart people. They're cramming so hard so then you get stressed that you have to cram as well. Then we test each other and then when you realise you don't know something you feel very, very stressed. You freak out.

Ultimately, this peer comparison process, whereby the selective students only had other, similar and higher achieving peers to evaluate themselves against, led to a negative impact on academic confidence. The comparison process also resulted in a level of anxiety and exam stress that exceeded a healthy, adaptive, or normal amount. Furthermore, this anxiety and exam stress actually led to adverse academic effects for the students. The following perspective demonstrates how the intense unease felt by students at exam time hampered their ability to study effectively:

Before exams, everyone's pulling their hair out and asking people to pull their hair out for them. Everyone's just having a nervous breakdown.
Everyone's hugging.
Yeah. You don't actually get much studying done, even though you want to because you just can't think straight.

Mixed-achievement setting students. For the students located in the mixed-achievement comprehensive setting, while exam time was also a source of stress, in the following indicative statement it is highlighted that the concerns do not stress social comparison so much as questions of the student's own preparedness, and their own relationship to the subject under study:

I get stressed out about the French test, because French is such a—I just hate it. So in essence I kind of get bored and I find myself being distracted by small things and I can't pay attention, then when the test comes, the night before I'll actually have to try and read through my textbook, and it's really hard.

Exam anxiety and the associated atmosphere of tension for these comprehensive students, was reported to be less pressured and intense, compared to the selective setting. Exam stress was overwhelmingly framed as: “General stress. Just before a test. The urge to study and get good results.”

Return of Results

The return of results was also a time when high achieving students felt badly, or expressed anxiety about coming to school: “Getting a test back. If I did badly, I don't want it back. Let it burn”. This was an experience shared across the educational settings. The fear of receiving a bad mark, an instance where students felt that fear was actualised and justified—“If you don't do well in work”—provoked stress. The following interchange reveals how one student’s response to receiving a mark back and seeing in print the mistakes that had been made, resulted in feeling “terrible”:

Student 1—It’s when you get the papers back and you see the mistakes you made. That is pretty terrible.

Interviewer—Well, you wouldn't have made many though, right?

Student 2—One mistake.

Student 1—No, two mistakes. Two half marks.

In the academically selective setting, not only did students worry about the return of assessments, but they also had to contend with the anxiety produced by the additional practice of “Getting marks back in front of each other. Sometimes you do crap and then you know you're going to do crap so it's just, whatever. Just, oh crap.” It was commonplace within the selective school for teachers to “call out” students’ marks during class. It is clear in the following exchange that this was a very daunting practice for the students, where they were explicitly ranked in comparison to their classmates:

Student 1—They just call out the mark. It’s scary.

Student 2—It's scary. It's like “Oh no, my name's coming up.”

Student 3—It’s like 50, 50, 50, 20, 50, 50.

Student 1—Now you can say that you don't want to call it, but then people are just like, “Why don't you want the teacher to call it?”

Assignment Overload

All of the students interviewed, highlighted assignment pressures as another source of anxiety. Specifically, it was a commonly held view by the students that the distribution of assignments lacked planning and consideration. They felt it was often the case that “You have a week of those every year where you have six assignments

due on one week. Every single subject, it's all due, so nobody's asleep at night.” The students believed that this continual practice of a multitude of assessments being due at the one time was down to the teachers thinking, “Oh, the reports are coming out; we'd better give you all the assignments now”. Furthermore, students felt that teachers failed to “talk to each other” about due dates in other subjects, leading to a feeling of being overloaded with work that “piles up eventually, it's too hard”, rather than being spread out across the school term in a more manageable and less anxiety-inducing way:

For example, this week, I've got quite a lot of stuff due. The teachers don't really talk to each other about which grade has what due and what day. So some weeks you can have nothing for two weeks in a row and then, bam, you get dumped with five assignments. It's really common. I think the most I ever had was 11 assignments at one time.

Student Reports

Another common source of anxiety for these high academic achievers was report day. The worry centred upon the anticipation of a perceived poor result. The idea of seeing such a mark in print, one that did not meet the high academic standard set by this group of students, served to authenticate all of the fears and concerns held:

Report day. Before you know you did badly, but then you think “Oh I might have done well, my other stuff I did well, but then my exam I did bad.” Then when you see the report it's actually there.

Confirmation. It's in writing.

Yes it's in writing and you have to show your parents. This is my mark.

It's scary. I don't like the report.

The reality of the report being read and judged by parents, and the resultant consequences (discussed in a previous section) was at the forefront of the students' thoughts:

Any other day, I'd be like, ‘Oh well, I'll do well in the next test.’ If you think you did badly and you pretty much did bad, and if you do bad you get dropped, and then your parents will find out and there will be a lot of consequences.

Lack of Subject Engagement and Teacher Engagement

Whilst the selective students overwhelmingly related sources of negativity to academic testing, academic performance, ranking of results, and comparisons with peers, students from the mixed-achievement environment voiced concerns surrounding their lack of engagement with classes and topic areas. Specifically, the

subjects about which students felt they had little understanding, and in which they subsequently had lost interest, the ones “I really don't like or understand”, made it an unenjoyable time at school:

For me that would be Science because I hate Science so much. Sometimes it just ruins my day. I'll come out of Science and I'll just be in such a bad mood because of it. I have no interest in Science so it sort of goes in one ear and out the other ear and my teacher doesn't help at all. She goes very quickly. So if you don't listen for one second you've missed everything. Mainly only in Science that I get really stressed out because I just don't know anything.

Furthermore, the idea that teachers contributed to this feeling was reinforced. The following quote outlines that students felt frustrated and ill prepared for examinations when they perceived that their teacher had not provided the required information and preparation:

You get frustrated when you have a test because sometimes you compare yourself to people from other courses and you'd be like, “they have such a good teacher, they have the notes, they have everything they needed for the test”, and then when we got our test we didn't even know about it. It's like, ‘How come you're not teaching us, we want to get a good mark, but you're not really helping us.’

The Selective Setting Buffer

It was clear from the interviews involving academically selective students that the pressure to achieve from parents, the intense atmosphere surrounding exam day, the practice of returning marks in front of the class, and explicit comparisons with peers were powerful and anxiety-provoking situations faced by students. The selective students explained the shared feeling that they were, in a sense, buffered against this intensity by the strong relationship held amongst their peers within the school: “We pull together. Common pressures, common situations.” Other students were seen as a major source of support that helped to disperse and dilute the intensity of the parental demands and school environment: “You want to see your friends if you feel stressed out because they'll make you feel better.” Everyone was, in a sense, “in the same boat”:

The thing is your friends are all there as well. You're usually not the only one feeling stressed. So people are supportive. You have people to stay up with you and people to help you. It's good.

The closeness of the student community within the selective school and its potential to cushion the intense academic atmosphere, are encapsulated in the following comment:

I think generally people at [the school] are great people and specifically our class has been exactly the same class since year 7. So that's four years and it's a long time to be with anyone. A quarter of our class right now is the same from primary school as well. We've just been together so long; we're like family now. You just can't separate us pretty much.

The discussion in this section has described circumstances and events that generated feelings of anxiety amongst the high achieving students. In the final section of this chapter, the focus turns to aspects that the students believed set their school, and more specifically their academic setting, apart from others.

School Reputation and Pride

This final theme outlines the factors that engendered a sense of pride amongst the students in relation to their school, and the elements they believed created their school's reputation.

Mixed-Achievement Setting: Academia and Beyond

The high academic achievers within the mixed-achievement comprehensive setting believed that their school had a strong academic reputation. They felt that their school's strong academic performance held up not only against local public schools, but also against the excellently performing selective schools that surrounded them:

I think that seeing we're a public school we're doing very well. Our school's a lot better than the other public schools and we do very well. We have a pretty high standard even compared to a lot of selective schools.

The students were proud to attend the school, and felt that “this school is full of opportunities and gives you chances that you might not have otherwise had”. The shared idea was that every chance to succeed was open to them, and they were privileged to attend a school with so many resources and prospects on offer: “The range of subjects that you can choose—so you can find out what you like and what you don't like and what you want to do after school.”

Moreover, the students felt that “this school's good because this school has people that achieve academically, but we also have people that achieve in sports. So

that's a good thing.” That the school had a history of achievement not only in the academic sphere, but also had “achieved a lot in a lot of different areas, like sport, education, arts, music” was a commonly voiced evaluation, and this diversity was highly important to these students. The multicultural diversity of the school and the connections developed between students were valued also:

Also the diversity of people—there are people from a lot of different background cultures and when you come to school and you're surrounded by them all day, you learn more about them, so you come to accept them. Which some people actually don't do until after school. So yeah, it's actually pretty good.

Perceptions of Selective Schools

The mixed-achievement school students were acutely aware of the top performing academically selective schools in the surrounding area, with the school's academic results often being directly compared by students, parents, and schools alike. As such, these students had formed a very clear perception of what they thought it would be like to be a student within one of these selective schools: “It's more stressful, studying all the time, tutoring all the time.” The students felt that within their mixed-achievement educational setting, “there's more freedom here and less pressure. Even if I made it into the top school I wouldn't go because I think there's too much pressure. They expect you to do well.” High pressure, high expectations, and high judgement were central to this perception: “I think that from the variety of abilities we have here, we can't be judged as much I think.”

The comprehensive students ultimately believed that their academic results would suffer from being situated in such a pressured setting: “I have a friend who goes to a selective school and she was really smart, but then she started struggling because of all the pressure and that, and she's like struggling with all the assignments and all that.” Moreover, they held the belief that selective schools focused solely on academic results, with little consideration of other areas that were encouraged within their school: “You don't hear of anyone that is good at sport in selective schools. I've never met anyone. They're mainly academically, and only in certain areas.”

Selective Setting: Academia and Beyond

The academically selective students voiced the pride they felt in the immense academic reputation of their school: “When you see the ATAR average for the school, you kind of come to school knowing that you're going to get that and it's a

good feeling.” They were not only proud of their school as a whole, but held the achievements of their peers in high regard, and saw great success in their futures:

I think it's nice when you come to school and you know that everyone around you, they're going to be so successful in 20, 30 years. So it gives you a good feeling because you're with them and you get to see them.

Moreover, these high achieving students relayed the positive experience of the high academic standing of their school being reflected and esteemed by others, particularly amongst parents and Asian heritage families:

I think with the selective reputation you get from other people and you say, “I go to School X” and it's like nice I guess. Especially Asian mums . . . In the Asian families, you've just got respect. They say “Try and go to School X, very good.”

Aware of the common perception that selective students did not do well in areas other than academia, such as in the sporting field, they offered a counter-perspective: “Yeah, I love sport. We have grade sport; you try out for it. We have PE lessons and it's fun. We have a lot of guys in our grade that form teams to play.” Nonetheless, the students did acknowledge that there was perhaps less time for out-of-school sports activities, due to the workload they faced:

In terms of out of school sport—I don't think that many people do out of school sport. Maybe a few people do have swimming lessons or tennis but maybe once or twice a week but not that common. On Saturdays, I have a goal to finish all this work. I do freelance work for Science so I've got to work as well.

The school community and environment were also regarded as major contributors to the students’ pride in their school reputation. Linking back to the theme of buffering in the selective school, the student body was seen as an asset to wellbeing:

Our community. Everyone's, like compared to other schools, everyone's a lot friendlier and there's not bitching and stuff like that. Like in other schools they have groups and they only stick with those groups and they only talk to those people. But with [our school] it's like everyone talks to everyone. If you're randomly on the bus or if you're lost when you're in Year 7, everyone helps everyone. So it's a lot friendlier than other schools.

Awareness of Perceptions about Selective Schools

Perceptions of selective schools were clearly recognised by the students themselves. The following interaction between students is a good example of the

selective students' experience of being viewed and treated "differently" by students from other schools:

Other schools seem to view us kind of differently. They treat us differently. Like we're nerds.

Yes. Sometimes just out of the blue someone will just throw an insult or in some cases a rock.

On the train. Sometimes when we go on a train like, "Oh look it's [School X] we better leave" and they just go to another carriage.

Whilst the discussion in this section has clearly shown that, in line with the perceptions of mixed-achievement comprehensive students, the selective setting was characterised by intense pressure and competition, once again the supportive network of the selective school and of peers was put forth as a counter to this view:

[This school] doesn't have bullying. There's no, you have to give me your lunch money, whatever you see. Or fights actually. There's been one fight for all the years I've come here and that was just some guy slapping another guy. Especially our grade, I think we all really love each other. We support each other a lot and it's really great.

The selective students strongly voiced the belief that "we've got a huge support network. Everybody is just amazing: they're nice and they're smart and they're willing to help you. It's great. I love coming to school for all my friends." This connection between the students, and the supportive bond they shared, again was seen to act as a protective buffer against the intense academic environment:

That's not just within the grade, it's in between grades as well. You can turn to all the grades for help. You've done this before, so how do you approach this? They're willing to help you at recess and lunch, in their spare time.

Chapter Summary

This chapter has discussed a myriad of elements that contribute positively, negatively, and often a mixture of both, to the school life experiences of high academically achieving students located within academically selective and mixed-achievement comprehensive educational settings. The influence of teachers, parents, cultural background, the students themselves, their peers, and the wider school environment itself, presents a complex and multi-layered story. Teachers have been shown to be integral to students' achievement across academic settings. The influence of parents, with parents seen as one of the major sources of pressure to achieve well academically, is moderated by cultural background. Educational setting also was seen to shape the academic self-perceptions and buoyancy of these students,

with the comprehensive setting emerging as ultimately a more positive one in respect of these domains of wellbeing. Student anxieties were shown to centre upon academic-related issues, with the selective environment again emerging as more fiercely competitive and pressured. That the selective students were still achieving exceptionally well academically, appeared to be due in part to the buffering effect of the supportive school environment.

CHAPTER 9 DISCUSSION AND IMPLICATIONS FOR MEASUREMENT, THEORY, RESEARCH, AND PRACTICE

Introduction

The key goal of this research was to conduct a systematic evaluation of two of the current educational provisions in NSW for high academic achievers, namely academic selective schools and mixed-achievement comprehensive schools. The study was undertaken as a foundation for advancing educational measurement, theory, research, and practice in this critical educational area. In order to address this goal, Study 1 examined whether the quantitative survey instruments utilised in the present investigation were psychometrically sound and invariant measures of the constructs they purported to assess for the samples under study. Study 2 quantitatively examined the impact of differing educational settings (selective and mixed-achievement comprehensive) on academic success and psychosocial wellbeing outcomes for high achieving students. Moreover, the study examined the dynamic relations between the various achievement and wellbeing constructs, and determined whether the strength and direction of these associations was consistent across differing school settings and levels of achievement: selective students, high achieving comprehensive students, and other achieving comprehensive students. Lastly, the purpose of Study 3 was to highlight and enrich the quantitative findings by analysing student focus group interview data to gain insight into high achieving students' direct experiences and perceptions of their school life.

This chapter has four main components. Firstly, the results from Study 1, which evaluated the psychometric properties of the instrumentation used in the present investigation, are discussed. In the second main section, the key quantitative and qualitative research findings emanating from Study 2 and Study 3 are reviewed and discussed interactively, and in relation to prior theory and research. Thirdly, the strengths and limitations of the present investigation are identified. Lastly, the

significance and implications of the findings for measurement, theory, research, and practice are illuminated.

Study 1 Discussion: Psychometric Properties of the Instrumentation at Time 1 and Time 2

Introduction

One of the vital steps in conducting sound research is to resolve of within-construct issues, before between-construct issues can be addressed (Byrne, 2003; Marsh, Ellis, et al., 2005; Marsh, Martin, et al., 2006). More specifically, within-construct studies assess the internal structure of a construct, whereas between-construct studies investigate how a construct may be associated to other constructs in a theoretically consistent manner. As the preponderance of concepts in educational and psychological research are hypothetical, they must first be validated using a strict construct validity approach in order for them to be useful in testing and building theory (Marsh, Martin, et al., 2006). With the aim of contributing to the rigour of educational research, this study aimed to establish the psychometric properties of the instrumentation utilised, prior to proceeding to between-network relations.

Hence, this component of the research assessed at both time points of testing the normality, reliability, structural validity, and invariance across critical groups of the WRAT4 (Wilkinson & Robertson, 2006), the ASDQ-II subscales (Marsh, 1990b), the SDQII-S subscales (Marsh, Ellis, et al., 2005), the ABS (Martin & Marsh, 2006; 2008a), the IAP (based on Organisation for Economic Cooperation and Development, 2002), and the DASS-21 subscales (Lovibond & Lovibond, 1995) at both time points of testing. Lastly, the psychometric properties of the instrument battery as a whole were assessed. Each of these instruments is now be discussed in turn.

The Wide Range Achievement Test 4 (WRAT4)

The WRAT4 (Wilkinson & Robertson, 2006) measures academic achievement across three domains: Mathematics, Spelling, and Sentence Comprehension. As hypothesised, normality and reliability estimates for all facets of achievement surpassed the minimum criteria of acceptability at both time points of testing. Also consistent with predictions, the proposed factor structure of the WRAT4 was supported by CFA, as the model provided a good fit to the data.

Specifically, all item loadings were substantial in size, and the correlations amongst the three factors of achievement supported the presence of three distinct domains. Finally, tests of invariance demonstrated that the WRAT4 items were interpreted similarly across males and females, junior and middle year levels, and selective, high achieving comprehensive, and other achieving comprehensive students. The results emanating from the psychometric assessment of the WRAT 4 in the present study support previous research that has demonstrated the measure to be reliable and valid (Lucas et al., 2003; Roche & Thompson, 2007; Wilkinson & Robertson, 2006). Hence, the WRAT4 was deemed an appropriate measure for use in the current study.

Academic Self-Description Questionnaire II (ASDQ-II) Subscales

Two subscales of the ASDQ-II (Marsh, 1990b) questionnaire were selected to assess students' self-perceptions of their capabilities in Mathematics and English: their academic self-concepts. As predicted, the Mathematics and English subscales were normally distributed and reliable measures of their constructs. Furthermore, as hypothesised, CFA supported the factor structure of the ASDQ-II subscales, as evidenced by sound goodness-of-fit indices, factor loadings, and factor correlations. Also consistent with predictions, factorial invariance testing supported the use of the Mathematics and English academic self-concept subscales across gender, year level, and school setting/achievement groups. It was concluded that the psychometric results of the present study reinforced the multidimensional nature of self-concept (Marsh, Ellis, et al., 2005) and supported prior research that has consistently demonstrated the reliability, construct validity, and factorial invariance of the ASDQ-II measure (Byrne, 1996; Byrne & Shavelson, 1996; Hattie, 1992; Marsh, 1990c; Wylie, 1989). As such, the selected subscales of the ASDQ-II were considered valid for use in the present investigation at both time points of testing.

Self-Description Questionnaire II Short (SDQII-S) Subscales

For the present investigation, two subscales of the SDQII-S (Marsh, Ellis, et al., 2005) were chosen to measure Parental Relations and General School self-concepts. In support of predictions made, the two subscales were found to be normally distributed and internally consistent. Furthermore, the CFA results demonstrated support for the construct validity of the hypothesised two-factor structure of the SDQII-S subscales via acceptable goodness-of-fit indices, factor loadings, and factor correlations. Additional tests of invariance showed that the parameters of the SDQII-S subscales were invariant across gender, year level, and

student setting/achievement subgroups as predicted. These psychometric results were consistent with prior research that has demonstrated the robust factor structure and sound reliability of the SDQII-S instrument (Ellis et al., 2002; Marsh, Ellis, et al., 2005). Therefore, the Parental Relations and General School self-concept subscales of the SDQII-S were deemed acceptable measures for use at both time waves of testing in the between-network component of the present investigation.

Academic Buoyancy Scale (ABS)

The ABS (Martin & Marsh, 2006; 2008a) was employed to measure students' perceptions of their ability to cope with setbacks, challenges, adversity, and pressure in the course of everyday school life. Originally a single factor, domain-general measure, the ABS was adapted for use in the present study to include two domain-specific dimensions, measuring academic buoyancy in the areas of Mathematics and English. Following some minor modifications to the newly adapted measure (see Chapter 6 for further details), tests of normality and reliability demonstrated that the two academic buoyancy subscales were normally distributed and internally consistent. CFA provided support for the adapted measure, indicating the validity of the central buoyancy constructs. The goodness-of-fit statistics indicated an acceptable model fit, factor loadings were substantial in size and significant, and factor correlations indicated the presence of two distinct factors. Tests of invariance further confirmed the validity of the instrument as measurement invariance was achieved across gender, year level, and student setting/achievement sub groups. Hence, all hypotheses made in relation to the psychometric evaluation of the ABS were supported. These findings have added to existing research that has supported the reliability, construct validity, and invariance of the ABS in its original, single dimension form (Martin & Marsh, 2006; 2008a). It was determined that the adapted ABS scale was a sound measure of domain-specific academic buoyancy at both time points of testing in the current study.

Index of Achievement Press (IAP)

The IAP (Organisation for Economic Cooperation and Development, 2002) in its original conceptualisation was a single dimension that measured the degree to which students experienced pressure to achieve from their teachers to perform well academically. However, it was extended for the present investigation to include a parallel dimension assessing pressure to achieve from parents. As predicted, the Teacher and Parent subscales of the pressure to achieve instrument were normally

distributed, and the reliabilities were deemed acceptable. Also consistent with the hypotheses made, the proposed a priori factor structure of the extended IAP was supported by CFA. Specifically, the model provided a good fit to the data, the factor loadings were satisfactory, and the factor intercorrelations supported the existence of two distinct domains. The strong psychometric properties of the IAP at both time points of testing were further demonstrated through tests of invariance that supported the equivalence of the items across males and females, junior and middle year levels, and selective, high achieving comprehensive, and other achieving comprehensive student groups. Taken together, these findings were consistent with prior research that has supported the construct validity of the original IAP, and moderate yet acceptable levels of internal consistency (Adams & Wu, 2002). Hence, the IAP was considered a psychometrically sound measure to assess pressure to achieve from significant others in the present investigation.

Depression, Anxiety, and Stress 21 (DASS-21) Subscales

Typically, the DASS-21 (Lovibond & Lovibond, 1995) measures three defined mental health factors: Depression, Anxiety, and Stress. However, due to recent evidence (Cole et al., 1997; Henry & Crawford, 2005; Lahey et al., 2004; Szabo, 2010) that suggests it may be difficult to distinguish between all three facets of the DASS-21 amongst young people, and research that has found that the Stress factor may not be distinguishable from the other two factors (Griezel, 2007), only the Depression and Anxiety subscales were included in the current study. As hypothesised, the Depression and Anxiety subscales of the DASS-21 were normally distributed, and were reliable measures of the constructs they purported to measure. Moreover, consistent with the predictions made, the validity of the factor structure of the DASS-21 subscales was supported. Lastly, the Depression and Anxiety subscales met the requirements of invariance across gender, year level, and student setting/achievement groups across both time points. These findings, supporting the psychometric soundness of the DASS subscales, were consistent with prior research that has supported the DASS-21 in a variety of research and clinical contexts (Antony et al., 1998; Bados et al., 2005; Lovibond & Lovibond, 1995). With all hypotheses in relation to the Depression and Anxiety subscales of the DASS-21 supported, the findings demonstrated that the Depression and Anxiety subscales are appropriate for use in adolescents.

Instrument Battery

Although the psychometric validity of each instrument was separately established, it was also necessary to determine whether the structural integrity of each measure was maintained when all instrumentation was combined into a single CFA. This is to reflect the administration of the survey items to students in a combined battery. The multi-scale CFAs conducted at Time 1 and Time 2 demonstrated that, as predicted, the models provided a good fit to the data, all factor loadings were substantial in size and were significant, all factor correlations indicated the presence of distinct factors, and were logical in nature. It was concluded that the individual instruments maintained their psychometric properties at both time points of testing, even when embedded with other measures. Hence, concerns regarding potential method effects when administering multiple measures at one time were reduced.

Section Summary

Study 1 demonstrated that all instrumentation utilised in the present investigation was normally distributed, reliable, valid, and salient for the sample under consideration. As such, Study 1 provided a solid foundation from which to critically examine the school life experiences of high academic achievers educated in differing school contexts, which was the principal focus of Study 2 and Study 3.

Study 2 and Study 3 Discussion: Integration of the Quantitative and Qualitative Data

Introduction

The literature presented throughout Chapters 2 and 3 highlights that the appropriateness of NSW academically selective schools for best educating high academic achievers remains at the forefront of educational debate. Furthermore, the literature showed that this is largely because of the entrenched value positions that tend to be adopted on either side of the selective school model, with relatively little systematic evaluation of the comparative merits or disadvantages of the selective context in comparison to the mixed-achievement comprehensive school context (Vinson, 2002). Moreover, the review highlighted that existent research that has examined NSW selective schools is dated, has considered few student level outcomes beyond academic achievement and academic self-concept, and has produced inconsistent findings, due to varied methodological discrepancies across

studies. Hence, the overarching goal of the present investigation was to make a timely contribution to this educational debate through a synergistic, mixed methods approach comparing selective and mixed-achievement setting high achievers' school life experiences.

Study 2 aimed to quantitatively uncover any longitudinal, differential impact of the academically selective and the mixed-achievement comprehensive environments for high achieving students' academic performance, academic self-concept, academic buoyancy, relations with parents, pressure to achieve from teachers and parents, depressive tendencies, and levels of anxiety at two time points during the school year. Comparisons were made separately between the selective students and high achieving comprehensive students, and the latter group was also compared with other achieving students in the comprehensive schools. Furthermore, Study 2 attempted to disentangle the reciprocal relations between the psychosocial wellbeing and academic achievement constructs over time, and whether they varied as a function of school setting/achievement level groupings, in order to explicate those student characteristics that may enhance or impede their school life. Lastly, in response to the qualitative component of the study, the impact of cultural heritage on students' achievement and key wellbeing outcomes was investigated in a post-hoc manner.

Study 3, the qualitative component of the research, analysed data produced from focus group interviews conducted in both school contexts, with students who were purposefully selected on the basis of their quantitative results—namely, high achievement/high academic self-concept students, and high achievement/low academic self-concept students. Subsequently, the data enabled a comparative and contrastive investigation into the two educational settings by gathering first-hand accounts of high achieving students' positive and negative experiences of each environment. In doing so, it was hoped that the qualitative contribution of this research would: generate a more enriched understanding of the quantitative data, with the perceptions and experiences of the students being directly heard; elucidate the mechanisms and nuances underlying the statistical results; and enable an extension and expansion of the quantitative findings by engendering different knowledge and insights not obtainable via the statistical component of the study

Hence, the following section culminates in the final stage of the mixed methods research design—the integration of data. Specifically, the results from the

quantitative and qualitative studies are discussed not in isolation, but interactively to uncover convergence, corroboration, divergence, and dissonance of findings, in order to generate a rich and deep understanding of the phenomena investigated. Moreover, this integration of the data was undertaken within the framework of prior theory and empirical research, in order to evaluate the present findings in the context of an existing body of knowledge. Each of the areas studied in the quantitative and qualitative components of the present investigation is addressed, specifically: academic achievement, academic self-concept, academic buoyancy, parents, teachers, and mental health outcomes will serve as the main sections. Interwoven within the sections addressing each of these components, are the quantitative and qualitative findings pertaining to the impact of differing schooling contexts for the outcome, the reciprocal relations between the construct and achievement across time, and the role of cultural heritage in influencing select student outcomes.

Academic Achievement

The impact of differing educational settings on achievement. In response to the research questions assessing the impact of differing school contexts on academic achievement outcomes across time, the quantitative findings indicated that, controlling for student level differences in SES and cultural heritage, students in academically selective schools performed significantly better in Mathematics, Spelling, and Sentence Comprehension at both time points, compared with their high achieving counterparts in mixed-achievement comprehensive schools. Furthermore, when prior academic achievement additionally was held constant, the selective students also made significant gains in the domains of Mathematics and Spelling, over and above the high achieving comprehensive students across the school year. However, the selective students did not value-add in the domain of Sentence Comprehension. In corroboration of the statistical results, the qualitative interview data also revealed the collective academic edge of the selective school. For example, the selective students explained the very high average ATAR (Australian Tertiary Admission Rank) of their school, which would rank highly by any other measure, in comparison to other local comprehensive schools.

Furthermore, the qualitative data was integral in shedding light on nuances in the statistical results above, demonstrating that the selective students only value-added in Mathematics and Spelling, and not in Sentence Comprehension. The interviews revealed that the selective school was principally known for student

success in Mathematics, and that the school itself encouraged this focus, with teachers, parents, and students all geared toward success in this particular subject. Also, students in the selective setting in particular, communicated that they held contrasting perceptions regarding their achievements and capabilities to succeed in Mathematics, as compared to English.

It was arguably the case that these differing perceptions of Mathematics and English were culturally bound, with the selective sample almost wholly comprising of Asian Australian heritage students. The students valued Mathematics more highly than English: this was a reflection of their beliefs that Mathematics was objective, “right or wrong”, and could be studied for, whilst English was subjective, had multiple possible answers, and resulted in the students feeling that they could not control their success in this area. The same perceptions were also reflected by the high achieving students of Asian Australian background within the mixed-achievement comprehensive setting. However, the equal proportion of students of Anglo Australian heritage within the qualitative sample drawn from the comprehensive school, who did not hold the same beliefs regarding Mathematics and English, meant that the cultural perceptions of Mathematics and English were less concentrated within this context, compared to the selective setting.

Interpreting the statistical findings, research on Confucian East Asian students demonstrates that there is an emphasis on repetitive effort in learning, and that there exists evidence of dichotomous processes in their learning, compared to Anglo heritage students (Ho & Hau, 2010). Spelling can be memorised in a similar way to Mathematics, and only one answer can be correct; however, comprehension of sentences cannot be rote learned, and multiple answers may be correct. Perhaps it was the case that the selective school was able to value-add in subjects that could be learned and studied for by repetition and memorisation (Mathematics and Spelling). However, in subjects where a deeper understanding of grammar and the spontaneous generation of many possible answers was required, they did not perform as well (Sentence Comprehension). Notwithstanding this, the results obtained in all academic achievement domains were substantially high.

The finding that the selective students achieved significantly better, academically, than the high achieving comprehensive students overall, appears to run counter to the conclusions of Hattie’s (2013) meta-analysis, which considered ability grouping practices more broadly, and argued that the statistical effect of tracking was

small and overall has minimal effects on academic outcomes. However, Hattie also found that any academic benefits from ability grouping at the single study level may be due to the academic environments generated within high achievement contexts, and that the mechanisms and processes of learning that they utilise may be more influential in producing academic benefits than the compositional structure of the schools alone.

Further, the qualitative findings of the present study lend support to a large body of research that has demonstrated that factors such as greater curriculum differentiation, increased curricular demands, and more intensive instruction are often found in higher educational tracks, and result in achievement advantages (Baumert et al., 2010; Becker et al., 2006; Hallam & Ireson, 2005; Ireson & Hallam, 2005; Konstantinou-Katzi et al., 2013; Kunter & Baumert, 2006; Maaz et al., 2008; Oakes, 2005; Trautwein et al., 2006). Specifically, the qualitative data in the present study highlighted the intense academic environment of the selective setting, where the teaching, learning, and school culture were all geared towards exceptional student academic success, in a more intensive manner than in the mixed-achievement comprehensive school setting.

Additionally, the results of the present study contrast with the limited early research that specifically considered the selective environment in NSW and concluded there was no academic advantage for high achievers (e.g., Jones, 1955; MacCann, 1984; Sampson, 1969; 1977). The conflicting findings may be due to the dated nature of previous research, which may have limited applicability to the students of today and was unable to capitalise on the many advances in research methodology since then. The present findings support more recent, yet still limited, studies that have found academically selective schools resulted in more university attendance (Braithwaite & Kensell, 1995), and were linked to a higher level of scholastic achievement than other educational settings (Robert, 2010). This is important, as the present study lends methodologically rigorous research support to the recent studies, which have been criticised for their lack of appropriate comparison groups, their use of single item measures, and the failure to control for pre-existing differences in student performance.

Aside from the selective environment itself, there are further factors that may have contributed to the substantial achievement differences between the selective and high achieving comprehensive students, and the apparent value-adding of the

selective setting. Firstly, as selective schools enrol the top academic performers within the state, based on their prior achievement and performance on the Selective Schools Test (NSW Department of Education and Communities, 2013b), there was a higher level of initial student achievement in the selective sample, as compared to the mixed-achievement comprehensive sample. Although prior achievement was statistically controlled for in the present study, students could not be specifically matched on their level of achievement due to sample size restrictions, and this may have increased the magnitude of achievement differences found. Indeed, Ireson and Hallam (2001) found that when students were specifically matched on academic achievement, the achievement differences between selective and non-selective systems were substantially reduced.

Secondly, a large body of educational research has demonstrated the Matthew Effect (Stanovich, 1986), whereby initial advantages in achievement become self-amplifying and cumulative across time. Early differences between those students who are more successful and those who are less so, become greater across time, as students who have higher achievement initially, make faster and greater educational gains compared to their less successful peers (Li, Marsh, Hau, Ho, & Martin, 2005; Rigney, 2010). Hence, it is logical to expect that schools with initially higher achieving students, such as the academically selective school in the present study, could have an artificially inflated positive added value.

Thirdly, the large differences in achievement between the selective and high achieving comprehensive students may have also been influenced by a type of statistical regression towards the mean artifact (Li et al., 2005; Marsh, 1998; Marsh & Hau, 2002). When participants are selected and allocated to groups because they are particularly low or high on a specific variable (in this case, academic achievement), their scores on the same outcome on a later occasion tend to regress toward the mean. Hence, students who achieve highly on one occasion will have systematically lower achievement scores over time, due to this regression (Li et al., 2005; Marsh & Hau, 2002).

In the present study, the selective cohort also had a substantially higher Time 1 mean achievement score than did the high achieving comprehensive cohort, so the achievement scores of the latter group would regress toward the mean on subsequent measures more than those of the selective students (Marsh, 1998). This greater regression to the mean for the mixed-achievement setting students may have resulted

in biased estimates of school growth for the academically selective program. Marsh and Hau (2002) also argue that the extent to which the population of selective students is not only more academically successful, but also environmentally advantaged in other ways compared to a comparison population, then the magnitude of the bias in favour of the selective students would be even larger. Thus, potential regression to the mean artifacts may have enlarged the achievement differences between the school environments across time.

Lastly, there are some important caveats regarding the concept of value-adding itself. Value-added measures provide one indicator of change in student achievement by assessing standardised test scores, and academic achievement is but one part of a student's school life. Rather, critics have argued that the concept of value-adding must be extended, to holistically encapsulate all of the contributions that a school makes to student development (Amrein-Beardsley, 2012; Hunt & Merrotsy, 2010). A complete picture that takes into account school, teacher, parent, and student factors that directly affect student engagement, would be a more appropriate measure of the value that a school adds to a student's education. In such a view, academic achievement should not be used as the sole indicator of how much value a school adds. Equally as important is the psychosocial wellbeing of the students and how the school environment contributes to their healthy development across their educational lifespan. In light of these factors, the extent to which the current study found that the selective school achieved significantly better than the mixed-achievement comprehensive school in all domains, and value-added in Mathematics and Spelling, should be interpreted with caution.

It was also vital, to ensure methodological rigour, to make comparisons between the high achieving comprehensive students and the other achieving students located in the same educational context, with the latter serving as a quasi-experimental control group. In answer to the quantitative research questions posed, the high achieving students in the comprehensive schools performed significantly better than their other achieving peers in Mathematics, Spelling, and Sentence Comprehension at both points of testing. However, the high achieving comprehensive students only showed continued growth only in Spelling, although the effect size for this was not very large, and they showed no growth over time in Mathematics or Sentence Comprehension achievement.

A potential explanation as to why the comprehensive setting did not value-add in achievement may again be related to the intensive academic environment of the selective setting. The focus on success and the very high average achievement level of the student body may motivate the students in the selective school to perform as well as they can. In the comprehensive setting, the environment may well be less intense, and there are other, lower achieving peers with whom to compare achievements, such that the high achieving comprehensive students may not feel as much pressure to perform as those in the selective setting.

The impact of differing cultural backgrounds on achievement. As identified in the previous sub-section, the qualitative study revealed that the cultural heritage of students may also play a crucial role in their differential achievement in particular domains. Before proceeding to the findings, it is important to highlight that the discussion of ethnic group differences and cultural characteristics in the present study, is based on a broad classification of “Asian Australians” and “Anglo Australians”, which does not account for the many considerable within-group differences and nuances that are not shared across the groups. Hence, the following discussion takes care not to overly generalise the findings regarding cultural differences, but rather discuss the relevant findings for the specific students involved in this study.

The qualitative interview data showed that the students who believed they performed better in Mathematics than in English were predominantly of a self-identified Asian Australian cultural heritage, and that the same perceptions were not held as strongly amongst Anglo Australian heritage students. In light of this, the current study subsequently posed a set of quantitative research questions that had not been anticipated at the commencement of this project, to investigate the differential impact of the students’ cultural heritages on key outcomes highlighted by the qualitative data.

Within the quantitative data, cultural background was operationalised as Anglo and non-Anglo; students who reported a non-Anglo background were, in the great majority, of Asian Australian heritage. It is also important to note that comparisons between the two cultural backgrounds were conducted across the high achieving comprehensive and other achieving comprehensive student groups only, as contrary to the sample size requirements of five participants per questionnaire item within each group (Hills, 2008), the selective student group contained only five

Anglo Australian heritage participants. In response to the research questions posed to quantitatively investigate whether non-Anglo Australian students achieved better in Mathematics and worse in English than their Anglo Australian heritage peers, the post-hoc results corroborated the qualitative findings.

Specifically, students of a non-Anglo background performed significantly better in Mathematics than did students of an Anglo background at both points of testing, and the magnitude of this difference remained the same across time. The results for Spelling indicated that regardless of their cultural background, students achieved similarly in this domain each time they were tested. Lastly, students of a non-Anglo background performed significantly worse in Sentence Comprehension than did their Anglo heritage peers across the school year, and the size of this difference remained the same. These results were consistent for all students within the mixed-achievement comprehensive setting, irrespective of whether they were classified as higher or lower achieving. Hence, there is evidence to suggest that the educational settings in which students are located, together with their cultural background, are key influencers of their academic achievement.

The findings of the present study appear to support a body of evidence surrounding what has been termed the “East Asian learner paradox” (see Huang & Leung, 2005; Mok, 2006; Watkins & Biggs, 2001). Specifically, research has shown that collectively, East Asian students perform significantly better overall than their European counterparts in international assessments such as TIMSS and PISA, despite having pedagogical practices that emphasise strategies of repetitive effort, memorisation, and drill that have been deemed less conducive to deep learning (Lee, 2009; Wilkins, 2004). However, when the domains tested by these international assessments are considered, it has been argued that these pedagogical practices may be well suited to the tasks set by TIMSS, which assesses Mathematics and Science; hence their superior achievement (Stankov, 2010).

Also, when PISA findings are considered domain specifically, East Asian countries outperform the rest of the world, particularly in Mathematics, with the achievement gap much less in relation to Reading (Organisation for Economic Cooperation and Development, 2014). Additionally, research has also demonstrated that Western students expect Mathematics to be difficult, whilst some Asian heritage students see it as less challenging than do their Anglo peers (Eaton, & Dembo, 1997; Leung, 2001; 2002). In the present study, Asian Australian background learners

achieved better in Mathematics than, and as well in Spelling, as their Anglo Australian heritage peers; tasks where repetition and memorisation could be effectively employed. In the task that required spontaneous generation of answers and more creative thinking—that is Sentence Comprehension—the achievement gap between the Asian Australian and Anglo Australian heritage students was reversed.

However, research has also demonstrated that Asian background students integrate effort and ability attributions, performance and mastery goals, intrinsic and extrinsic motivation, and individualistic and collectivist orientations into their processes of learning (Hau & Ho, 2010; Rao & Chan, 2009; Watkins & Biggs, 1996). In the last decade, East Asian countries such as Singapore and China have acknowledged the necessity for, and have implemented, numerous educational reforms targeting teaching and learning processes, to foster more diverse learning skills in students (Chan & Rao, 2009; Ho & Hau, 2010).

Furthermore, Ho and Hau (2010) argue that Asian students' memorisation and drilling of academic skills is reinforced by a multitude of other system and cultural elements, including supporting values and beliefs, family and teacher guidance, and peer cooperation—elements that may not operate to the same degree in Anglo heritage culture. Hence, more research is needed on the exact nature and features of the learning processes and approaches utilised within different cultural groups, and how they may generate specific academic outcomes, before any solid conclusions can be drawn as to their effectiveness.

Summary of achievement findings. The quantitative and qualitative findings jointly demonstrate the increased academic performance overall of the high achieving students located in the selective setting, compared to the high achieving students located in the mixed-achievement comprehensive environment. It must be acknowledged, however, that some statistical considerations may have influenced the magnitude of the difference between these groups, and also the extent to which the results suggest that the selective environment can be said to value-add to students' achievement over and above the mixed achievement setting. There was also a clear discrepancy in the attainments of the selective students in Mathematics and Spelling as compared to the English domain of Sentence Comprehension, and the qualitative findings further illuminate that the cultural heritage of students may also have played an influential role in this regard.

These findings suggest that whilst the selective setting enables students to build upon the skills in Mathematics and Spelling that they already possess, in order to experience growth throughout the school year, the same does not occur for the more subjective English domain, which requires an ability to understand, comprehend, and produce text. Intersecting with this point, whilst students of Asian Australian heritage excelled in Mathematics, they performed significantly worse in Sentence Comprehension, compared to Anglo Australian heritage students. Hence, selective students and some students of Asian Australian heritage could perhaps benefit from deeper engagement with, and learning in, these domains of English. Indeed, different pedagogical approaches that work to enhance student understanding and success in this subject area (e.g., Munns, Sawyer, & Cole, 2013) are a vital next step.

Additionally, the results also showed that high achievers in the mixed-achievement schools showed no growth over time in Mathematics or Sentence Comprehension, and that the effect size for growth in Spelling was small, compared to their lower achieving school peers. These findings suggest that the students in the comprehensive setting may benefit from greater fostering of growth in personal bests in achievement. Achieving the fullest possible development of students may be encouraged through increased support and resourcing of comprehensive schools and their teachers, smaller class sizes to facilitate more one-on-one interaction, and diverse enrichment and extension programs.

This sub-section has discussed the impact of differing school settings and cultural backgrounds on achievement outcomes for high academic achievers. The next sub-section addresses the results in relation to academic self-concept.

Academic Self-Concept

The impact of differing educational settings on academic self-concept. In support of the hypotheses made, the quantitative findings revealed that despite their academic successes, the selective students possessed significantly lower Mathematics, English, and General School self-concepts than their high achieving counterparts in mixed-achievement schools at both time points of testing, after controlling for SES, cultural background, and prior academic achievement. In addition, change over time analyses also revealed that when prior academic self-concept levels were also held constant, the selective students' self-concepts in Mathematics became significantly more negative between Time 1 and Time 2,

compared to the high achieving comprehensive students. The magnitude of the difference between the academically selective and high achieving comprehensive students in terms of their English and General School self-concepts remained similar throughout the school year.

The qualitative findings further verified the statistical results, demonstrating that high achieving students' academic self-perceptions were shaped by the educational setting in which they were located, and were also moulded by their previously self-reported levels of higher or lower academic self-concept. Overall, students within the academically selective setting expressed more negative beliefs regarding their academic capabilities than did the high achieving students located within the mixed achievement setting. It is reasonable to conclude that this was, in part, a direct consequence of the intense atmosphere of student comparison and competition within the selective setting. Very few marks separated those who came first in the grade, from those who came last. Pressure also emanated from the ranking of students into classes based on this highly restricted range of achievement, and the possibility of being dropped down to a lower class, with the accompanying peer stigma and parental disapproval.

This competitive environment in the selective setting appeared to contribute to the students' feelings about their academic standing and performance. Even those selective students who had previously reported a higher level of academic self-concept in relation to their within-school peers, were reluctant to recognise their high academic standing and consistently downplayed their abilities in Mathematics. Furthermore, perceptions of English were inextricably tied to the perceived subjectivity of the domain: the students seemed to value this subject less than Mathematics, and did not evaluate their performance highly in this area. For the lower self-concept selective students, an overwhelmingly poor perception of their skills in both Mathematics and English was shared. Despite their poorer self-perceptions, the selective students indicated that support from peers within the school acted as a buffer in the competitive selective environment, such that they still attained exceptional academic results.

That the qualitative data revealed that the selective students valued their performance in Mathematics more than English, and that this was tied to the Asian Australian cultural heritage of the students, offers a clear explanation for the quantitative results. The selective students' Mathematics self-concepts worsened

over time, in comparison to mixed-achievement setting students, whilst their lower levels of English and General School self-concept were maintained throughout the school year. The selective school was principally geared towards performance in Mathematics, and the students held their achievements in this domain in much higher regard. The selective setting comprised many other highly achieving students who were excelling in Mathematics, against whom the students compared their achievements. Hence, the selective students' self-concepts were more negatively affected in Mathematics than in other academic domains.

The qualitative findings revealed that the atmosphere of comparison and competition in the mixed-achievement school was less pressurised, due to the greater diversity in achievement levels. The high achieving students with higher self-concepts—in agreement with their previously reported perceptions—held positive beliefs regarding their attainments and successes in Mathematics and English. This group of students was able to recognise and voice their significant academic standing. The lower self-concept comprehensive student group communicated a mixed perception of their achievements, with performance in Mathematics couched in terms like “average”, and with a poorer perception of capability in the domain of English. The perceived subjectivity of English, as opposed to the objective nature of Mathematics, was also a consistent theme for some students within the mixed-achievement setting, particularly those of Asian Australian heritage. Indeed, the qualitative data revealed a cultural basis to perceptions of academic performance across both schooling environments, which is covered in more detail in the next subsection.

Although the present investigation was not an explicit test of the BFLPE, analyses of the quantitative and qualitative data provided evidence of a BFLPE for NSW academically selective schools. These results are consistent with a wealth of previous research that has found students educated in schools or classes where the average achievement of their peers is high, will possess more negative academic self-concepts than their equally high achieving counterparts in schools or classes where the average achievement level is lower (e.g., Craven et al., 2000; Marsh, 2005; Marsh & Craven, 2002; Marsh & Hau, 2003; Marsh et al., 2001; Marsh, Seaton, et al., 2008; Marsh, Trautwein, et al., 2007; 2008). These findings are concerning, given that extensive research has found that a high self-concept is vital in and of itself for positive mental health and wellbeing outcomes, and is a causal driver of

academic achievement and other important educational outcomes (e.g., Guay et al., 2003, 2004, 2010; Marsh, Trautwein, et al., 2005; Marsh & Craven, 2006; Nagy et al., 2006; Trautwein et al., 2006). Hence, selective settings may benefit from introducing strategies and practices that are aimed at reducing the competition within the schooling environment, and programs to enhance the self-concepts of their students.

Despite the prolific nature of BFLPE research, this is the first study to provide evidence for the negative impact of a high school-average achievement level specifically within NSW academically selective schools. Prior Australian research has focused only on primary schools (Craven et al., 2000; Marsh et al., 1995; Marsh & Parker, 1984), and the single high school-based study did not investigate selective schools, but rather high achieving students across varying schools (Marsh, 2004). Additionally, the BFLPE model has been criticised for failing to account for the multidimensional nature of academic self-concept, with the bulk of research in this area employing either domain general academic instruments, or a single academic domain (Parker, Marsh, et al., 2013). By considering the domain-specific areas of Mathematics and English in the same study, the present investigation has contributed a multidimensional perspective to the body of BFLPE research.

There has also been a paucity of research to investigate the BFLPE qualitatively, and furthermore from a mixed methods approach (e.g., Jackman et al., 2011). Marsh, Seaton, et al. (2008) highlighted that there is an important role for mixed methods research, whereby the quantitative approach is coupled with a qualitative approach to explicate a deeper understanding of the nature of the BFLPE and the role of social comparison processes. The qualitative component of the present investigation has added support and corroboration to the statistical evidence of a BFLPE in operation in NSW selective schools.

The interview data have also provided a more nuanced perspective of the implications of differing schooling contexts for high achieving students' academic self-concepts, than would have been uncovered with a quantitative approach alone. The data revealed further layers to the BFLPE, by considering students based on their self-reported higher and lower academic self-concepts in relation to their within-school peers. Specifically, even those students, who were amongst the highest achievers from the academically selective school, and who reported higher self-concepts in relation to their peers, did not acknowledge their academic capabilities or

their academic standing. This finding is concerning given the perspective that it may be the highest achievers within the selective schools who may reap the most benefits from this educational provision (Marsh & Craven, 1994).

In comparing the high and low achieving student groups located within the mixed-achievement comprehensive schools, the quantitative results demonstrated that the students did not differ in terms of their Mathematics or English self-concepts over time. High achievers within the comprehensive setting held lower General School self-concepts than their other achieving counterparts at Time 1. However, the effect size for this difference was very small. Over time, this difference diminished and the two groups reported similar levels of General School self-concept by the end of the school year. Hence, all students within the mixed achievement setting held similarly high perceptions of their academic capabilities in Mathematics, English, and across all schooling subjects more generally. That the high achieving students within the comprehensive schools did not possess more positive academic self-concepts than their lower achieving counterparts may be due to the achievement context of this setting. The less competitive nature of the comprehensive environment, alongside the wider spread of achievement, may explain this result. The lower achieving students may compare their academic performance with other, lower achieving peers within their classes, and thus feel confident about their academic abilities.

The role of comparison in the development of academic self-concept. The qualitative findings were also integral in providing support for, and clear examples of, the types of internal and external comparison processes or frames of reference that are said to give rise to the formation of students' academic self-concepts. Research has shown that individuals' perceptions of themselves are not solely objective, but are also influenced by the context in which they evaluate themselves (Dijkstra et al., 2008; Ireson & Hallam, 2009; Marsh, 2007).

Within the focus group interviews, the high achieving students outlined how one method of evaluating their academic standing and successes at school was through comparing their current performance in a particular domain with their past performance in that area: "My essay writing has just gone way up. It's much better than it was last year" and "With Maths, I'm more comfortable this year so again I'm doing better." Temporal comparison processes (Albert, 1977), the less researched of all comparison types, highlight how internally based comparisons of one's present

performance with one's past performance are critical to the formation of self-evaluations (Rheinberg, 2006). Hence, the present investigation showed that internal temporal comparisons were critical to the development of high achieving students' academic self-concepts.

The findings from the current study are also consistent with social comparison theory (Festinger, 1954) and the majority of associated research (e.g., Chmielewski et al., 2013; Huguet et al., 2009; Marsh et al., 2014), which has shown that external frames of reference are also vital in academic self-concept formation. Individuals compare their performance against the performance of others within their class and school (Marsh, 1987a), and this process of social comparison forms the basis of the BFLPE, where upward comparisons have negative effects on self-evaluations.

As demonstrated by the quantitative and qualitative data, the selective students possessed significantly more negative Mathematics, English, and General School self-concepts than their equally high achieving peers in the mixed-achievement setting. In explanation of this, the focus group interviews revealed that the high achieving students utilised external social comparisons of their own achievements, with that of their peers within their classes and school, in order to formulate their academic self-evaluations. For example, "In Maths, I'm just like on this level. It's so hard to get up because everybody's higher", "Well Maths . . . I'm doing ok. I'm not at the top", "I'm not confident because the marks are so close", and ". . . when you compare it to other people, there are people who get full marks and then get high distinction. Then if you get a distinction you feel pretty bad."

Ultimately, the high achieving students had different standards of reference with which to evaluate their academic capabilities, depending on the school setting in which they were located. Consistent with social comparison theory and research (e.g., Chmielewski et al., 2013; Huguet et al., 2009; Marsh et al., 2014), students located in the context of the selective school were more exposed to other, high achieving same-age peers than the high achieving students in the lower achievement contexts of the comprehensive schools, and this left selective students feeling that they were less adequate in comparison to their schoolmates. The close competition in marks as a tool for evaluation in the selective environment, ultimately seems to result in lower academic self-concepts for the high achieving students who attend them. Conversely, the lower intensity of competition for marks, and the greater spread of

academic results within the mixed-achievement setting, produces higher academic self-concepts for the high achieving students within this school setting.

Alongside social comparisons, the students interviewed in the present study also detailed their utilisation of dimensional comparisons in order to assess their academic standing. As specified in Marsh's (1986) internal/external frame of reference model (I/E model), dimensional comparisons refer to the internal comparisons students make of their performance in one domain against their performance in another (Eccles, 2009; Möller & Marsh, 2013). This comparison is ipsative, such that an increase in self-concept in one domain can trigger a decrease in self-concept in another domain (Marsh, 2007).

The high achieving students clearly assessed their proficiency in one academic domain, by considering how good they were in that area relative to other subject areas: "I'm not doing too well for Maths. English is worse though", "My Maths has been consistent . . . my English is not that great", and "Maths is ok. English is bad." Hence, the qualitative data was able to provide evidence in support of research that has considered these dimensional comparison processes (Marsh, 1986; Marsh & Hau, 2004; Möller & Köller, 2001; Möller & Marsh, 2013; Möller, Pohlmann, Köller, & Marsh, 2009).

In addition to the abovementioned comparison processes, the literature has also shown that students employ criterion-oriented comparisons, whereby they compare their performance with particular standards in order to form their academic self-concepts (Jonkmann et al., 2012). The qualitative data revealed that the high achieving students often evaluated their academic performance and capabilities in reference to the particular standard set by their parents, and this was predominantly the case for the students of Asian Australian heritage. For example, ". . . my parents' standards are high, I expect a lot of myself", and "[I need to achieve] at least 90 percent because of my parents." The employment of criterion-oriented comparisons in the development of academic self-perceptions was particularly salient for those high achieving Asian Australian students experiencing pressure from their parents to succeed academically.

Taken together, these qualitative findings provide validation of the quantitative studies that have demonstrated that students utilise various comparison processes to evaluate their academic accomplishments in relation to their current frame of reference (Chmielewski et al., 2013; Huguet et al., 2009; Marsh et al., 2014;

Möller & Köller, 2001; Möller & Marsh, 2013; Möller et al., 2009; Trautwein et al., 2009). In addition, this component of the research contributes to the smaller body of qualitative research that has analysed the contents of students' introspective diaries (Möller & Husemann, 2006), and found that students do make both external and internal comparisons in their daily life, and both types of comparison processes inform the development of their self-concepts.

The impact of differing cultural backgrounds on academic self-concept.

The qualitative data also highlighted that alongside school setting and prior levels of self-reported academic self-concept, the cultural heritage of the high achieving students was also influential in the formation of their academic self-concepts. For high achieving Asian Australian students within the mixed-achievement setting, and all students within the selective setting (interviewees were all of an Asian Australian background), Mathematics was viewed as objective, concrete in terms of a "right or wrong answer", able to be studied for, and performance in this area was internally regulated.

Conversely, English was perceived as subjective, uncertain in terms of many potential correct answers, success was "luck of the draw", and performance in this area was externally regulated. The ultimate outcome of these perceptions from the focus groups was that these students seemed to value Mathematics more so than English. The Asian Australian students' academic self-concepts were inextricably linked to their differing perceptions of Mathematics and English, such that perceptions of English were always associated with an inability to improve achievement. Alternatively, judgments regarding Mathematics self-concept were linked to perceived academic standing.

Driven by these findings, the quantitative data were re-examined in order to explore whether high and lower achieving comprehensive school students of Anglo and non-Anglo cultural heritage differed significantly in terms of their Mathematics and English self-concepts across the school year. In relation to Mathematics self-concept, the high achieving Anglo and non-Anglo students held similar self-perceptions in this domain. For the lower achieving students, non-Anglo students reported significantly higher self-concepts in Mathematics than did their Anglo peers at both time waves. In relation to English self-concept, high achieving non-Anglo students reported significantly lower self-perceptions in this domain than did Anglo background high achievers at Time 1 and Time 2. For the lower achieving students

in the comprehensive setting, cultural background did not significantly impact on their English self-perceptions at either time wave.

Firstly, these quantitative findings triangulate with the qualitative interview data. Despite their immense successes in Mathematics, most of the high achieving Asian Australian heritage students did not convey self-evaluations that matched these achievements; hence, their similar levels of Mathematics self-concept in relation to their Anglo Australian peers. Furthermore, the qualitative data indicated that high achieving Asian Australian heritage students possessed even more negative English self-concepts in comparison to Mathematics, and in comparison to their Anglo Australian counterparts, and this was supported by the post hoc analysis of the statistical data.

Taken together, the research findings can be interpreted within the framework of Marsh's (1986) I/E model, which has found widespread empirical support (e.g., Marsh & Hau, 2004; Möller & Köller, 2001; Möller et al., 2009; Möller, Retelsdorf, Koller, & Marsh, 2011). The I/E model is based on findings that Mathematics and Verbal domains of academic self-concept have a near orthogonal relationship (Marsh, 2007). This model holds that students develop their academic self-concepts by externally comparing their performance in a particular domain with certain performance feedback, but also by internally comparing their performance in differing domains against each other. This latter comparison is ipsative, such that an increase in self-concept in one subject area leads to a decrease in self-concept in the opposing academic domain (Marsh, 2007). Hence, this may explain why Asian Australian heritage students in the present study experienced a decline in their English academic self-concepts, in contrast to their Mathematics self-concepts.

However, the finding that the high achieving Asian Australian heritage students did not report more positive Mathematics self-concepts than the Anglo Australian heritage students is of note. Cross cultural research within Confucian Asian culture that has demonstrated East Asian students differ from their Western counterparts in relation to competence beliefs, offers a potential explanation for this finding (e.g., Lee, 2009; Wilkins, 2004). Specifically, the precursor conditions for particular psychological processes and their effects may vary across differing cultural groups (Hau & Ho, 2010; Ho & Hau, 2010).

For example, whilst high self-efficacy and self-concept are vital precursors for academic motivation and later academic success in the Western framework,

research has shown that it is not an essential ingredient for Confucian Asian students' engagement in learning and academic success (Leung, 2002; Salili, Lai, & Leung, 2004). A higher sense of efficacy and self may not be as prominent in generating achievement behaviour within the Confucian Asian context as it is in the Western context, because there is no established relationship between their self-efficacy, their self-concept, and the expenditure of effort (Hau & Ho, 2010). Actually, a lower sense of self-efficacy may be a significant impetus for these students to work hard (Hau & Ho, 2010).

In the Western context, a lower sense of self-efficacy and self-concept is considered undesirable, and is linked to more negative educational outcomes. However, in Confucian Asian culture, lower self-evaluations may not provoke the same kind of negative consequences for educational outcomes (Ho & Hau, 2010). The traits of humility and modesty are considered virtues, and feelings of inadequacy are often intrinsic components of the drive for self-perfection in learning and achievement (Li, 2009). Furthermore, research has argued that students from Confucian culture consider ability to be malleable via hard work, with academic success attributable to effort and viewed as a fulfilment of one's duty (Huang & Leung, 2005; Kim & Park, 2006; Mok, 2006; Pan et al., 2013; Watkins & Biggs, 2001). In this way, successes may not be as important a foundation of self-perceptions as in the Western environment. Hence, the high achieving Asian Australian heritage students in the present investigation, despite their successes in Mathematics, may not have as high academic self-concepts in this domain as their Anglo Australian counterparts do in their most successful domain of English, due to the cultural differences in the meaning, process, and function of academic self-concept.

Alternatively, the literature has also argued that some Asian heritage families may be more unforgiving towards underachievement and misbehaviours as compared to more Anglo parts of the world (Hook et al., 2013; Neff et al., 2008; Stankov & Lee, 2008; 2009). Alongside this, research has supported the immense familial and societal pressure to achieve academic success that is placed on some students within Asian culture (Woo et al., 2004). Indeed, as is reviewed in a later section of this chapter, the high parental expectations for achievement and the pressure to achieve from parents experienced by students of an Asian Australian heritage within the current sample, was significant. It may be that for some students

who experience these elements of Asian heritage culture, the resultant effect is more negative health and wellbeing outcomes, as may be the case with academic self-concept in the present study.

However, future research that more specifically considers within-culture nuances is required to further delineate the culture-specific meanings and effects of self-concept, before concrete explanations can be offered. The etic and emic characteristics of psychological processes are, as Ho and Hau (2010) note, still not well understood. Additionally, longitudinal research that tracks students well beyond high school is also vital to assess whether these culturally influenced, lower academic self-concepts persist into the future. It has been argued that empirical attention to the psychosocial wellbeing of East Asian students has been neglected in favour of a focus on academic achievement (Juang et al., 2013; Sung, 2010). Thus, the present investigation's consideration of wellbeing constructs beyond achievement within a cultural context, offers a valuable contribution to this field of research.

The reciprocal relations between academic self-concept and academic achievement. As predicted, the statistical results revealed that Mathematics self-concept and Mathematics achievement shared a significant and positive reciprocal relation for the other achievement comprehensive student group ($n = 1266$). However, contrary to predictions made, the beta path values for the selective sample ($n = 432$) were only significant for Mathematics achievement at Time 1 affecting Mathematics self-concept at Time 2, and neither of the REM paths were significant for the high achieving comprehensive sample ($n = 294$). Despite the significant REM relations for the lower achieving comprehensive students, and the non-significant relations for the selective and high achievement comprehensive groups, the Wald chi-square test of parameter equalities indicated that the strength of the beta paths representing the REM for Mathematics were statistically similar across all three groups.

Similar results were found for the REM between General School self-concept and Mathematics achievement. For the lower achieving comprehensive school students, Prior General School self-concept was significantly associated with future gains in Mathematics achievement, and prior Mathematics achievement reinforced subsequent General School self-concept. However, none of the paths representing these relations were significant for the selective sample or for the high achieving

comprehensive sample, as was hypothesised. Again, the Wald test indicated that the strength of all paths representing the REM were statistically similar across groups.

There may be competing explanations for these findings. Firstly, although the predicted REM relations for Mathematics self-concept and Mathematics achievement did not reach significance for all three groups, the direction and size of all the beta path values were, in fact, consistent with and larger than those found to be significant in typical REM research with larger samples (Guay et al., 2003; Marsh, 2007b; Marsh & Craven, 2006; Marsh & O'Mara, 2008; Marsh, Trautwein, et al., 2005; Valentine & Dubois, 2005). Similarly, despite the predicted reciprocal relations between General School self-concept and Mathematics achievement not reaching significance for all three groups, again the beta path values were larger than those characteristically found in past REM research based on larger sample sizes (Marsh & Craven, 2006; Marsh, Trautwein, et al., 2006). Furthermore, that the beta path values for the REM relating to General School self-concept and Mathematics achievement in the present study were smaller than those for Mathematics self-concept and Mathematics achievement, is also consistent with previous REM research (Marsh & Craven, 2006; Marsh, Trautwein, et al., 2006).

The above REM findings, and the magnitude of the beta paths representing these relations are important, considering that the academic achievement measure utilised in the present study was a standardised achievement test. Indeed, research (e.g., Marsh, Trautwein, et al., 2005) has shown that the relation between self-concept and school grades is stronger than the relation between self-concept and standardised achievement tests. This is because students are argued to perceive standardised tests as being "low stakes" in comparison to school based tests (Marsh, 1987a, 1990a). Hence, given the smaller sample size of the present investigation, and the employment of a standardised achievement measure, the sizes of the beta paths for the REM pertaining to the Mathematics achievement outcome are important.

Additionally, the magnitude of the beta path values for the Mathematics REM across all three school setting/achievement groups are noteworthy, given that there were very high stability coefficients for achievement, leaving little unexplained variance for any other variable to have an effect. Additionally, there was a short, six-month time lag between points of testing. Also, the unequal sample size of the groups may have impacted upon the lack of significance of the REM for Mathematics for the selective and high achievement comprehensive students.

Specifically, tests are less powerful if the groups under comparison are of unequal sample size, as is the case in the present research, such that failure to detect significance may arise when the group with the larger number of participants exerts a greater influence on the parameter estimation process (Cheung & Lau, 2011).

Hence, it may be that the beta path values for the Mathematics REM may have reached significance in the selective and high achieving comprehensive samples in a larger and more equal sample, consistent with previous research that has supported the REM for Mathematics across samples of gifted and mixed-achievement students (Seaton, Marsh, et al., 2014). Alternatively, the cultural heritage of students and differences in the process of academic self-concept across culture, may underlie the non-significant REM findings for Mathematics self-concept, General School self-concept, and Mathematics achievement within the two high achieving student groups.

Indeed, this latter point regarding a potential cultural interaction with the REM, alongside a potential school context interaction, appears to be more appropriate in relation to the results regarding the English achievement domain. Specifically, as hypothesised, prior English and General School self-concept were significant and positive predictors of later Spelling and Sentence comprehension achievement, and prior Spelling and Sentence Comprehension achievement were significant and positive predictors of later English and General School self-concept for the lower achieving comprehensive student group only. Contrary to the hypothesis, whilst the beta paths for these relations were non-significant for the high achieving comprehensive students, the positive direction and magnitude of the paths were in keeping with previous REM research (e.g., Marsh, Trautwein, et al., 2005; Marsh & Martin, 2011; Marsh & Yeung, 1997a). For the selective school sample, however, whilst English and General School self-concept did not significantly predict English achievement or vice versa, the beta path values for these relations were also quite small and negative. These findings were not consistent with prior REM research regarding English/Verbal self-concept and achievement (Marsh, Trautwein, et al., 2005; Marsh & Martin, 2011; Marsh & Yeung, 1997a).

As has been discussed, the qualitative data revealed that students of Asian Australian cultural heritage, and most principally within the selective school setting (due to the composition of students almost wholly from this background), held quite contrasting perceptions of Mathematics and English, perceiving that they were never

able to achieve success or consistency in English through their own efforts. Additionally, the focus on Mathematics success, over and above that of English, within the selective school environment by the school itself, the teaching staff, parents, and students, may have implications for the negative relations between English and General School self-concept and English achievement. Perhaps it is the case that the de-valuing of English achievement, alongside potential cultural differences in the process and function of self-concept as previously outlined, means that the REM within this domain may not be represented for the selective sample.

These findings are in opposition to the large body of REM research that has found support for the effect in a myriad of studies across academic and non-academic domains (Nagengast & Marsh, 2011; Trautwein et al., 2008), in varying countries and cultures (Liem et al., 2013; Marsh & Hau, 2003; Seaton et al., 2009; Nagengast & Marsh, 2012; Van de gaer et al., 2012), and in experimental and quasi-experimental conditions (Alicke et al., 2010; Marsh et al., 2001; Wouters et al., 2012). However, the majority of this REM research has reported primarily on the reciprocal relations between Mathematics self-concept and achievement, and to a lesser extent, domains such as Science and English. The REM in relation to English achievement may not operate in the same way as Mathematics, particularly if there are significant cultural variations in the sample studied.

It appears that the findings in relation to the REM are consistent with aspects of the research conducted by Liem et al. (2015) in Singapore. Specifically, the authors found that the correlation between Mathematics self-concept and Mathematics achievement was stronger for the lower achievement stream than for the high and middle achievement streams, as was the case in the present study. Also in keeping with the current results, Liem et al. found that the correlation between English self-concept and English achievement varied across achievement groups, however, the exact group differences did not parallel those within the current study.

Overall though, the findings of the present investigation and that of Liem et al. (2015) imply that potentially distinct patterns of achievement and self-concept relations, particularly in relation to the domain of English, could be present across different school settings, different achievement levels, and/or different cultural backgrounds. Indeed, there is a paucity of research examining the REM from a high academic achievement standpoint (e.g., Liem et al., 2015; Seaton, Marsh, et al., 2014), and also in relation to English. Accordingly, further research is needed to

explore these issues and disentangle the effects of differing academic domains, school contexts, achievement levels, and cultural backgrounds, before concrete explanations can be formed.

Summary of academic self-concept findings. The results emanating from the present study imply that students in selective schools hold lower academic self-concepts in comparison to their high achieving peers located in mixed-achievement school settings. The highly competitive and intense academic environment of the selective school results in more negative implications for self-perceptions. The quantitative and qualitative data also showed differences in cultural heritage intersected with school setting differences in relation to academic self-perceptions, with high achieving students of Asian Australian heritage possessing equal self-concepts in Mathematics to lower achieving students, despite their greater success in this domain. Moreover, high achieving Asian Australian heritage students possessed significantly more negative English academic self-concepts than their Anglo Australian peers. The qualitative data revealed that the selective students valued their performance in Mathematics more than English, and that this was also tied to the Asian Australian cultural heritage of the students.

These findings are of concern given that extensive research has shown that a positive self-concept is key not only for achievement, but also plays a vital role in many more important life aspects, including educational and career outcomes, and mental health and wellbeing across the lifespan (Craven & Marsh, 2008; Guay et al., 2004; Marsh, 2007b; Marsh & Craven, 2006; Marsh & Martin, 2011). Hence, the results imply that selective settings may benefit from programs that aim to enhance the academic self-concepts of their students, alongside their academic success. Additionally, the selective setting and some Asian Australian heritage students in the comprehensive setting may value an increased focus on English, and diverse pedagogical approaches (see Arthur & Hertzberg, 2013; Cole, Mooney, & Power, 2013; Munns & Sawyer, 2013) to increase student engagement, effort, motivation, and success in this area.

The qualitative data was key in revealing the comparison processes utilised by high achieving students in order to formulate their perceptions of their academic capabilities. The presence of more intense competition and greater closeness in the spread of marks, seemed to lead to the more negative self-perceptions of the selective students. Within the mixed-achievement setting, students were able to compare their

standing across a less concentrated environment of competition, and a wider array of achievement levels. This most likely resulted in their high perceptions of their academic capabilities.

The results in relation to the presence and equivalence of the REM across the selective students, the high achieving comprehensive students, and the lower achieving comprehensive students, hold significant implications for theory and practice. Whilst the relation between Mathematics self-concept and Mathematics achievement was ultimately supported across all three groups, the same could not be said for the English domain. Specifically, whilst English self-concept was positively related to English achievement and vice versa for the comprehensive school students, these relations were small and predominantly negative for the selective school students. Hence, it may be that school setting, level of achievement, and/or the cultural background of the students may be interacting with the relation between English self-concept and English achievement. It is important for future research to more explicitly unravel these effects, so that interventions targeting self-concept and pedagogy may be appropriately directed.

This sub-section has discussed the impact of differing school settings and cultural backgrounds on academic self-concept outcomes for high academic achievers. Furthermore, the reciprocal relations between academic self-concept and academic achievement for the differing schooling contexts were discussed. The next sub-section addresses the results in relation to academic buoyancy.

Academic Buoyancy

The impact of differing educational settings on academic buoyancy. In response to the research question regarding the differential impact of attending a selective or mixed-achievement school for high achieving students' buoyancy in Mathematics and English, the quantitative results showed that controlling for SES, cultural background, prior achievement, and prior buoyancy, both groups of students were equally buoyant in Mathematics and English across the school year. However, the qualitative interviews revealed that there may be a more nuanced and layered story to school setting differences in academic buoyancy. Three of the four focus group settings spoke of being largely resilient and robust in the experience of a bad Mathematics or English result. Specifically, the students from the mixed-achievement setting, regardless of their high or low academic self-perceptions, and the higher self-concept students from the academically selective setting

communicated that they were buoyant, motivated, and committed to trying harder after a perceived setback at school.

Conversely, the selective students who self-reported lower academic self-concepts in relation to their within-school peers, lacked the drive to bounce back after a less than ideal result, seemed to accept their current position within the school, and perceived they could do little to improve their academic standing in the future. Again, this seemed to be directly linked to the close academic competition within the selective school, that, when coupled with their already lower academic self-concepts, led to lower academic buoyancy. Thus, it may be the case that the more general, overarching structure of the quantitative results did not allow the more specific, secondary impact of self-concept beneath that of school setting, to be uncovered.

The present study is the first to examine academic buoyancy within a GAT context, and furthermore in relation to the impact of differential educational contexts for this important student outcome. Hence, the finding that lower self-concept students in the selective school also possess lower buoyancy in relation to school based setbacks is of concern, given that research has shown lower academic buoyancy is negatively linked to factors that impede student engagement, such as anxiety, working to avoid failure, and uncertainty about how to do well (Martin, 2013). A specific focus on the development of a more positive self-concept, alongside the fostering of buoyancy for those selective school students who are experiencing the most negative outcomes for their psychological health and wellbeing, would be of value. Additionally, engagement literature that highlights ways to involve students in important reflections about their learning, and takes them beyond worrying about marks (Munns & Sawyer, 2013) should be considered a vital next step to ensuring the potential of these students.

The comparisons conducted between the high achieving comprehensive students and the other achieving comprehensive students also revealed no significant differences in terms of academic buoyancy in Mathematics or English throughout the school year. These results are surprising in that level of student achievement did not appear to detract from the students' abilities to cope with academic stressors in Mathematics or English. As with the academic self-concept results, perhaps the less competitive nature of the mixed-achievement setting, and the greater range in student

achievement levels meant that students of all achievement levels were able to maintain their buoyancy at school.

The reciprocal relations between academic buoyancy and academic achievement. In answer to the research questions regarding whether academic buoyancy would be a significant predictor of later achievement, and prior achievement would be significantly related to subsequent academic buoyancy for the selective, high achieving comprehensive, and other achieving comprehensive student groups, the findings were overwhelmingly non-significant. For all samples, Mathematics buoyancy at Time 1 was not linked to Mathematics achievement at Time 2. For the selective students only, Mathematics achievement was a significant positive predictor of subsequent Mathematics buoyancy. Across all students, English buoyancy at Time 1 did not significantly relate to Spelling or Sentence Comprehensive at Time 2, and prior English achievement did not affect later English buoyancy.

These findings are in contrast to longitudinal research that has demonstrated that students who are the most academically buoyant obtain the highest academic grades (Barnett, 2012). There are a few potential explanations for the present investigation's failure to find a significant link between academic buoyancy and academic achievement. Firstly, it may be the case that the constructs of academic self-concept and academic buoyancy share a meaningful overlap. Indeed, academic self-perceptions are formulated, in part, based on students' evaluations of their present performance in relation to their past performance (Rheinberg, 2006). As such, an aspect of students' beliefs as to their ability to bounce back after a less than desired result would logically form part of their academic self-concept development. Perhaps the construct of self-concept may absorb enough of the variance explained by academic buoyancy. The very high stability coefficients for achievement within the present study, established that achievement is so stable across time that any further predictors of this outcome cannot be very large. Self-concept may be a stronger predictor of achievement than academic buoyancy, such that little remaining variance explained in the achievement outcome may underscore the lack of significant relations found.

Additionally, the quantitative and qualitative data within the current study have also revealed many cultural heritage interaction effects. As previously discussed in regard to academic self-concept, cross cultural research has indicated

that particular psychological constructs may not have the same processes and operation for some East Asian students as they do for some Western students (Hau & Ho, 2010; Ho & Ha, 2010; Li, 2009). As the current sample comprised a significant proportion of students from Asian Australian heritage, perhaps the concept of academic buoyancy does not carry the same meaning for this cultural group. Whilst research has found evidence for this notion in relation to older, and more widely studied constructs such as self-concept (see Hau & Ho, 2010) and depression (Woo et al., 2004), there has been no research to investigate cross-cultural differences in the buoyancy-achievement nexus.

Summary of academic buoyancy findings. The quantitative findings revealed that high achieving students, irrespective of their school environment, were equally buoyant in Mathematics and English at both time points of testing. However, the qualitative data revealed that the students within the selective setting who also possessed lower academic self-concepts, were simultaneously less buoyant in response to perceived academic setbacks. The findings highlight that the selective setting may not be the most appropriate educational provision for all high achieving students. It may be the case that those students who are not as confident about their academic abilities, and who are not as resilient against perceived setbacks at school, may not benefit academically or psychosocially from the selective setting. Furthermore, the results also show the need for interventions to aid those students who are less able to cope with the selective school context, and are thus experiencing negative psychological effects that could have educational, career, and wellbeing implications well beyond high school.

The statistical results examining the presence of reciprocal relations between academic buoyancy and academic achievement longitudinally were, overwhelmingly, non-significant. Such results may be attributable to an overlap between aspects of the buoyancy construct with that of self-concept, the small amount of variance left in the achievement outcome at Time 2 after differences at Time 1 have been accounted for, or potential cultural differences in the meaning and operation of psychological constructs. Future research that considers the emic and etic aspects of academic buoyancy for specific cultural groups is required to more fully explicate the relations between buoyancy and achievement.

This sub-section has outlined the impact of differing school settings on academic buoyancy outcomes for high academic achievers. Additionally, the

reciprocal relations between academic buoyancy and academic achievement for the contrasting educational settings were discussed. The next sub-section addresses the results in relation to the influential role of parents.

The Influence of Parents

As the constructs of Parental Relations self-concept and Parental pressure to achieve emerged as being conceptually linked within the present study, the following sub-section discusses the findings in relation to these outcomes simultaneously, for clarity and logical flow.

The impact of differing educational settings on Parental Relations self-concept and Parental pressure to achieve. The results investigating the research question regarding the differential impact of contrasting school settings on Parental Relations self-concept revealed significant context differences. Controlling for SES and cultural background, the academically selective students reported significantly worse relations with their parents than did their high achieving counterparts located in the mixed-achievement comprehensive schools at both Time 1 and Time 2.

Change over time analyses revealed that the magnitude of the group difference in Parental Relations self-concept was maintained throughout the school year.

Concurrently, the students within the comprehensive school setting, regardless of their level of achievement, possessed similarly positive Parental Relations self-concepts throughout the school year.

The statistically poorer relations with parents held by the high achievers within the selective setting as compared to their equally high achieving peers within the comprehensive setting, is in contrast to the limited research that has assessed this outcome within a GAT context (e.g., Craven et al., 2000; Marsh et al., 1995; Marsh & Craven, 1998). Indeed, the overall conclusion of previous research has been that GAT settings have negative implications for academic self-concept over time, but little or no effect on non-academic domains of self-concept. Diverging with the present results, Craven et al. (2000) found no difference in Parental Relations self-concept between primary school students in a selective GAT program, and high achieving students in mixed-achievement classes and streamed classes within schools. It must be said that a pull-out GAT program in primary school is markedly different to the selective secondary school environment considered in the present study, which may explain the discrepancy between findings.

Additionally, the current findings are also at odds with those of Marsh and Craven (1998), who found that in comparison to students from mixed-achievement schools, students from nine NSW selective schools had higher Parental Relations self-concepts at the start of the school year, with the difference completely diminishing by Time 3. Perhaps the dated nature of the research may underlie the lack of research consistency, as this earlier research did not incorporate the many methodological and statistical advances since then, and may have limited applicability to the students of today. Alternatively, the selective students' significantly more negative relations with their parents in the present study may be linked with their experiences of pressure to achieve from their parents, and the interrelation of cultural heritage with such experiences. The qualitative findings regarding the cultural interaction with, and perceptions of, Parental pressure to achieve are discussed in greater detail in the next sub-section, and linked back to this notion.

That selective students have poorer parental relationships than their high achieving comprehensive school counterparts is arguably a significant problem, given that positive relations are a vital ingredient in the development of well-rounded adolescents and for the promotion of positive health and behaviour outcomes. For example, better parent-child connections are associated with improved mental health outcomes, lower rates of delinquency (Hair et al., 2008), higher achievement, and fewer behavioural and learning problems at school (Gaylord-Harden, 2008). Coupled with the findings in relation to academic domains of self-concept, it appears that selective school students not only require more positive enhancements of their academic perceptions, but also a focus on building and facilitating better interactions between students and parents.

In regard to school setting differences in parental pressure to achieve, the quantitative findings revealed that controlling for SES, culture, and prior Mathematics and English achievement, high achieving students located within the selective setting and the mixed-achievement setting reported equally high levels of Parental pressure to achieve throughout the school year. In addition, the high and lower achieving students within the mixed-achievement comprehensive schools did not differ significantly in terms of the level of pressure they reported from their parents at Time 1 or Time 2.

The statistical findings imply that it is not just selective school students who are being pushed to achieve by parents, but also students within the mixed-achievement schools who are also facing pressure extensive pressure. However, once again, the qualitative data was instrumental in revealing that these findings may not be accurately capturing the true nature of Parental pressure effects. Rather, differences in cultural heritage amongst students interact with school setting in the consideration of differences relating to the extent of pressure to achieve from parents.

The impact of differing cultural backgrounds on Parental Relations self-concept and Parental pressure to achieve. Perhaps the most vital contribution of the qualitative component of this study was the unexpected revelation that the significant influence of parents, the pressure they placed on their children to succeed, and the resultant implications for students' academic success and psychosocial wellbeing were, in fact, culturally embedded and shaped. Irrespective of whether the high achieving students were located within the selective or mixed-achievement setting, differences in Parental pressure to achieve and Parental Relations self-concept were instead between students who self-identified as Asian Australian heritage, and students who identified as Anglo Australian heritage. Broadly, Asian Australian students relayed higher parental achievement expectations and standards, greater pressure to achieve from parents, and stricter parental control and strategies. From the qualitative data, four main themes emerged in relation to the culturally bound influence of parents: (a) "You should be doing well" versus "I can see your hard work"; (b) "You must be the best" versus "Do the best you can"; (c) "You must be a doctor" versus "Do what makes you happy"; and (d) The push to achieve.

The first theme highlighted the perceived cultural differences in parental expectations and standards for achievement, and parental recognition of such achievements. Specifically, Asian Australian high achievers felt that high academic achievement was viewed as merely expected by their parents. Parents were perceived as readily communicating their disappointments when students did not attain to their desired standard, whilst academic successes were not as recognised or acknowledged: "You should be doing well." This resulted in most Asian Australian high achieving students within the qualitative sample feeling reluctant to acknowledge their own successes and high academic standard. In contrast, the high achieving Anglo Australian background students communicated that doing well at

school was certainly encouraged; however, expectations were not as high, success was judged upon the students' best effort, and academic successes were more readily acknowledged.

Extending on this, the second theme revealed that not only did the Asian Australian students feel that they were expected to achieve well academically, but that they must perform at the very top of the school. The students felt an immense pressure from their parents to achieve, and they could consistently identify the standard they were required to meet according to their parents, and these were often incredibly high. They felt the challenge, stress, and pressure of attaining high results and coming first in everything, an impossible task made even more difficult with the students attending two of the best performing schools in the state. The Anglo Australian background students communicated that their perceptions of the expectations of their parents were that their best effort was the standard to be met. Whilst these parents did not tolerate "slacking off", they did not require them to be the top of the school but rather only to do the best they could.

The qualitative findings are consistent with cross-cultural research that has demonstrated Confucian or East Asian heritage families tend to have higher expectations and performance standards for their children than any other cultural group (Huang & Leung, 2005). Research has also shown that Confucian Asian students generally do experience great pressure to achieve academically, and significantly more so than their Western counterparts (Ho & Hau, 2010; Woo et al., 2004). The literature argues that the high regard for academic achievement, strong emphasis on academic success, and continual engagement with academic activities within East Asian culture is related to distinct cultural and sociological values (Pan et al., 2013), and to the historical standing and experiences of East Asian families within society encapsulated by the notion of voluntary minorities (Ogbu & Simons, 1998), and the theory of relative functionalism (Sue & Okazaki, 1990; Kim & Park, 2006). Each of these elements is supported by the qualitative data.

Asian Australian heritage students within the present study explained that they believed the fundamental reason for the higher expectations and standards they experienced was the sense of debt owed to their parents' struggles. It was a common history that their parents came to Australia with little money or personal belongings, and had built a life for their family: ". . . they came here with a suitcase and \$200 and now they've got cars and houses and stuff. So they expect us to work as hard as they

did to repay that.” This notion links directly to the Confucian philosophy of *filial piety*, defined as upholding the honour of the family, self-sacrificing obedience to parents’ wishes, and obligation to parents and the family (Pan et al., 2013). Hence, for some East Asian families, it is a positive value for children to feel indebted for their parents’ sacrifice and support, which subsequently reinforces *filial piety*, and promotes academic success (Kim & Park, 2006).

The sense of debt owed to parents, and recognition of their parents’ struggle that was conveyed by high achieving Asian Australian heritage students in the present study, also supports Ogbu’s notion of voluntary minorities (Ogbu, 1992; Ogbu & Simons, 1998). Voluntary minorities describe people that choose to move to countries where they perceive better opportunities (better education, better jobs, more political or religious freedom) than they had in their homelands. For voluntary minorities, hardship is seen as temporary: they are goal driven, and strive to overcome language and cultural barriers with the belief that education and hard work overcomes all obstacles. Such ideals are also instilled within descendants and later generations. This notion and the characteristics of the voluntary minority, were clearly reflected by the Asian Australian students in the current sample.

Additionally, Asian Australian heritage students interviewed in the present study were also highly cognisant of the implications of their academic achievements, with their successes not solely for their own personal advancement, but equally for the honour their family. This perspective supports the literature that has argued broadly, that East Asian cultural values hold that the self and the family are inseparable, such that individual achievement is viewed as representative of the family (Huang & Leung, 2005; Mok, 2006; Watkins & Biggs, 2001). Hence, the students sincerely considered the implications and consequences of their academic successes and failures for their family.

The investment of increasing effort communicated by the Asian Australian students, more so than the Anglo Australian students within the present study, is consistent with research that suggests generally, Asian students espouse a cluster of valued attitudes, such as upholding high standards of achievement, striving to enhance the family’s status, viewing learning as a means of self-cultivation and self-perception, stronger emphasis on cumulative effort, practice, and discipline in school, and belief in persistence to obtain success, which provide the background for superior academic performance (Huang & Leung, 2005; Kim & Park, 2006; Mok,

2006; Stevenson et al., 1990; Woo et al., 2004). As the qualitative results have shown, these cultural values appear to be woven beneath the fabric of the Asian heritage student and parents' approach to school life within this study. Of course, it must be remembered that these broad conclusions are related to the students in this study, and also do not take into account the many and varied differences amongst families within cultural groups.

Beyond cultural and sociological values, the relative function of education as a means to achieving life success may also underscore the differing academic standards experienced by Asian Australian heritage students. The students interviewed believed that their parents viewed the academic pathway, and particularly prestigious university courses, as the principal avenue for their children to obtain life success. Consistent with this notion, the theory of relative functionalism (Sue & Okazaki, 1990) argues that in non-educational domains, success is not a clear and direct outcome of superior academic performance, such that upward mobility in careers or jobs is not clear. Hence, the relative value or function of education as an avenue to obtaining success increases, and education is viewed within some East Asian cultures as the primary functional means of achieving personal, familial, social, and career success (Kim & Park, 2006).

The theory of relative functionalism (Sue & Okazaki, 1990) and associated research (e.g., Kim & Park, 2006) was principally supported by the third theme that emerged from the qualitative data, which centred upon the apparent contrasting university and career expectations between Asian Australian students and Anglo Australian students. The former communicated that they had the choice of medicine, law, or commerce-law, careers their parents stated were of high standing, paid well, and would ensure upward mobility and economic and social status. In contrast, Anglo Australian students had a less concrete image of their career paths, and explained that their parents often stated personal fulfilment and interest as most important—"whatever makes you happy".

These findings support cross-cultural research in which Chinese heritage American families have reported higher educational and career expectations than European American heritage families (Huang & Leung, 2005). As Hau and Ho (2010) indicate, the mechanisms by which East Asian students navigate their learning path in modern times, with roots in both collectivistic and individualistic tendencies, still requires more research. "Nevertheless, the strong moral undertone

associated with the importance of being a good student has been consistent, embodying duties of self-cultivation as well as duties to the family and society” (Hau & Ho, 2010, p. 14).

The cross-cultural differences in educational and career expectations may also relate to cultural differences in learning-task value. Research has shown that Anglo students and families tend to define educational value in terms of interest, utility, importance, or cost from an individualistic perspective, such that task value is highly personal and arises from different developmental trajectories (Wigfield & Eccles, 2002). This was the case when the Anglo Australian students perceived their parents’ desires for their career stressed personal satisfaction as well as financial security. Conversely, related research within Confucian Asian families defines the value of achievement itself as a central tenet, to which all members of the culture usually advocate (Li, 2005). This was reflected in the Asian heritage parents’ prescription of the highest-ranking university courses as career aspirations.

The final qualitative theme in relation to the culturally bound influence of parents, centred upon the atmosphere of intense pressure to achieve from parents experienced by the Asian Australian students, and the strategies parents utilised to push them to meet their exceptionally high standards. Specifically, students of Asian Australian heritage communicated that their parents were more academically demanding, exerted greater control over their studying habits, engaged in increased parental monitoring and supervision which lessened the students’ autonomy, and more often imposed strict sanctions for academic performances deemed unsatisfactory, than was experienced by Anglo Australian students.

This theme also encapsulated the differing impact of these parental strategies, which depended to some extent on Asian Australian students’ academic self-concepts. For those with higher self-concepts in the selective setting, they were buffered against their parents’ pressure and strategies by their peers at school, and the strategies seemed to neither impact them negatively nor motivate them greatly. The high self-concept students from the comprehensive school setting showed the most adaptive and positive outcomes from parental pressure and strategies engaged. For students who had a lower self-concept, irrespective of school setting, parental pressure was seen as doing little to motivate students to try harder as their parents desired. For these students who were, in fact, high academic achievers and who already felt less positive about their academic capabilities, the high pressure and

expectations from their parents and the strategies to push them harder made them feel less capable. Anglo Australian students relayed less pressure from parents, and less demanding and strict strategies to encourage achievement.

As a consequence of the qualitative insights regarding differential cultural background effects in Parental Relations self-concept and Parental pressure to achieve, a post-hoc examination of the quantitative data was undertaken to assess whether the cultural differences illuminated in the focus group data were supported by the statistical data. In substantiation of the qualitative results, it was found that non-Anglo students reported statistically lower Parental Relations self-concepts than Anglo students at both time points, and this result was consistent for both higher and lower achieving comprehensive school students (selective students were omitted from these analyses due to violations of sample size requirements). The size of the difference in relations with parents was maintained across both time points of testing.

Again triangulating with the qualitative findings, the quantitative data also confirmed the presence of cultural differences in relation to pressure to achieve from parents. Specifically, non-Anglo background students reported significantly higher Parental pressure to achieve than did Anglo background students at Time 1 and Time 2, and irrespective of their higher or lower achievement level. The magnitude of the difference in Parental pressure was similar throughout the school year for the high achievers, but actually worsened between Time 1 and Time 2 for the lower achievers. Hence, both sources of data within the present investigation supported the presence of cultural differences in relations with, and pressure to achieve from, parents.

The literature regarding the parental strategies utilised by Asian heritage families has predominantly utilised quantitative data, and applied Western notions of parenting styles, with the conclusion that Asian heritage families are more authoritarian and hence, more negative (e.g., Chao, 2001; Eisenberg et al., 2001; Kim et al., 2005; Lamborn et al., 1991; Liew et al., 2014; Steinberg, Dornbusch, et al., 1992; Steinberg, Lamborn, et al., 1992). Rather, as is the case in the present investigation, the utilisation of such strategies may be related to more recent research that has considered a more complex and culturally specific understanding of Asian parenting practices, and avoided dichotomous judgments regarding perceived notions of right and wrong (e.g., Chea et al., 2013; Choi et al., 2013; Kim et al., 2013; Lamborn et al., 2013).

Specifically, this research has found that the parental strategies employed by some Asian heritage families may be more reflective of the concepts of *guǎn* (“safeguarding”) and *jiào xun* (“demandingness of excellence”) (Chao, 1994, 2001; Liew et al., 2014). *Guǎn*, meaning “to govern” and “look after” describes the parental duty of fulfilling children’s needs and safeguarding their wellbeing (Tobin, Wu, & Davidson, 1989). *Jiào xun*, meaning “to train or teach” refers to the parental duty of demanding excellence from children (Chao, 1994). Indeed, the Asian Australian students in the present study highlighted that the pressure and strategies utilised by their parents to push them to achieve were culturally common, and ultimately conveyed their parents’ concern and support.

Furthermore, the present results support the notion that rather than simply determining Asian students’ experiences as either positive or negative, research shows that there are a multitude of parenting aspects that may lead to differing outcomes, for each individual student (e.g., Kim et al., 2013; Supple & Cavanaugh, 2013). The results of the present study imply that for some Asian Australian heritage students, the heightened achievement expectations, coupled with intensive pressure to achieve from parents, may not be as conducive to increasing their motivation to succeed, may not be as adaptive for their self-evaluations of their competency at school, and may not be contributing to the most positive parent-child connections. Alongside this, those students who are also located within the intensive competitive environment of the selective setting are experiencing a substantial amount of pressure at home and at school. That some students may be negatively affected by this pressure is important, as pressure to succeed from significant others has been shown to have a detrimental effect on wellbeing (Rogers et al., 2009; Stoeber & Rambow, 2007), and has been linked with greater emotional problems among gifted students (Cho & Yoon, 2005).

In light of these findings, it would be useful for future research to be directed towards more specifically considering the cultural implications of pressure to achieve for high achieving students of differing cultural backgrounds. Additionally, schools, teachers, parents, and students would benefit from a greater understanding regarding the implications of pressure to achieve for the students themselves. It would be of benefit both academically and in terms of wellbeing, to strive to enhance the relations between high achieving students and their parents, and to ensure positive

and adaptive parental involvement in students' academic lives as a central component of intervention.

The reciprocal relations between Parental Relations self-concept and academic achievement. In response to the research questions regarding the existence of reciprocal relations between Parental Relations self-concept and academic achievement across time, for the selective students, high achieving comprehensive students, and other achieving comprehensive students, the quantitative results were largely non-significant. For all students, Parental Relations self-concept did not share any significant reciprocal relations with either Mathematics or Sentence Comprehension achievement across time. For the selective students, Time 1 Parental Relations self-concept was a significant negative predictor of Time 2 Spelling achievement, and the Wald test indicated that this path was significantly different to the positive path found for the other achievement comprehensive group, but similar to the negative path found for the high achievement comprehensive group. For all students, Time 1 Spelling achievement did not significantly relate to Time 2 Parental Relations self-concept.

The predominantly non-significant findings for Parental Relations self-concept are consistent with prior research that has demonstrated diverse academic outcomes are systematically related to their domain relevant facets of academic self-concept, but unrelated to other, non-academic components of self-concept (Marsh & Craven, 2006; Marsh, Trautwein, et al., 2006). Indeed, positive or negative relations with parents may have more implications for students in terms of their wellbeing, rather than their academic achievements. Alternatively, it would also have been of value to track the students within the present study into the senior years of schooling and beyond, to determine the longer-term impact of lower parental relations for the selective students.

The finding of a significantly negative relation between prior Parental Relations self-concept and later Spelling achievement for the selective students, and a negative but non-significant relation for the comprehensive school high achievers is surprising, considering that positive relations with parents promote desirable health and behavioural outcomes (Gaylord-Harden, 2008; Hair et al., 2008). A potential explanation is that this negative association may be directly linked to the pressure to achieve from parents that was experienced by the high achievers within

these schools, which is shown to have negative effects on achievement in the next section.

The reciprocal relations between Parental pressure to achieve and academic achievement. In answer to the research questions regarding the reciprocal relations between Parental pressure to achieve and Mathematics and English achievement, the results were again largely non-significant. Parental pressure to achieve at Time 1 was not a significant predictor of Mathematics and Sentence Comprehension achievement at Time 2. However, Time 1 Parental pressure was a significantly negative predictor of Spelling achievement at Time 2 for the selective student sample. The Wald test indicated that this path was significantly different to the positive path found for the other achievement comprehensive group, but similar to the negative path found for the high achievement comprehensive group.

For the selective students, Mathematics achievement at Time 1 was significantly positively related to pressure to achieve from parents at Time 2. Whilst this relation was not significant for the high and other achieving comprehensive students, the Wald test indicated that there was not sufficient evidence to conclude that the strength of the paths for this relation differed significantly across the three groups. Lastly, Time 1 Spelling and Sentence Comprehension achievement were not significantly related to Time 2 Parental pressure to achieve.

These quantitative findings were also consistent with the qualitative results highlighted above, in that pressure to achieve from parents tended to have adaptive effects for very few of the students (those high achievers in mixed-achievement settings with higher self-concepts), but rather failed to motivate most students, or impacted some negatively in terms of their beliefs regarding their capabilities. Indeed, the statistical data has also revealed that the more the selective students succeed in Mathematics, the more pressure they perceive from their parents. The highly competitive and highly achieving environment of the selective school may mean that even when students do perform at the top of their grade, they experience heightened expectations to maintain such a position. With two or three marks separating ranks across the grade, this may increase the pressure students' experience.

The research regarding the impact of pressure to achieve from parents for student academic outcomes has been inconsistent. For example, pressure to succeed from significant others has been found to have a detrimental effect on student

achievement (Campbell & Mandel, 1990; Campbell & Wu, 1994; Levpušček & Zupančič, 2009, whilst other research has shown no effects, or positive effects on achievement (Kim & Park, 2006). The results from the present investigation also demonstrate this inconsistency. It seems that for the present study, the immense pressure to achieve from parents experienced within the selective setting has no effect on academic success in Mathematics and Sentence Comprehension, and a negative effect on Spelling. Also, the higher the selective students achieved in Mathematics, the more pressure they perceived from their parents, and, as indicated in the qualitative study, their school peers acted as a buffer to this pressure. Furthermore, the pressure to achieve experienced by the comprehensive school high achievers had no effect on their subsequent academic results in all three domains.

As previously discussed, differences in cultural heritage also intersected with experiences of pressure, such that Asian Australian heritage students reported significantly more Parental pressure to achieve than Anglo Australian students. That these substantially high levels of pressure did not result in more negative academic outcomes, may be explained by cross-cultural researchers who have postulated that the level of pressure for optimal academic performance may vary across cultural contexts (Hau & Ho, 2010). From the Western perspective, pressure is often constructed negatively in the context of academic achievement. Yet, in light of the strict disciplinary practices in traditional Confucian culture and the high value for achievement, these students may be able to tolerate higher pressure without detrimental effects on their performance (Hau & Ho, 2010, Stankov, 2010). However, more empirical information regarding the operation of pressure in cultural context is needed, and caution should be exercised in making cross-cultural generalisations.

Additionally, the results may have also been impacted by the instrument utilised to measure Parental pressure to achieve, which did not assess domain-specific pressure in relation to Mathematics and English, but rather domain-general pressure. As differing perceptions regarding these academic areas were apparent in the present investigation, the utilisation of a domain-specific measure may have provided differing results. Additionally, pressure from parents has also demonstrated negative effects for wellbeing (Rogers et al., 2009; Stoeber & Rambow, 2007), and has been linked to increased distractibility, aggressiveness, helplessness, and emotional problems in gifted students (Kim & Park, 2006). Hence, for the students in

the present investigation, the impact of their experience of high expectations and pressure to achieve from parents for their psychosocial wellbeing, and for important achievement related variables such as motivation has not been determined.

Ultimately though, the findings imply that Parental pressure to achieve academically may not result in the desired improvements in academic performance, and in one case may result in a decline in achievement. Hence, education that involves schools, parents, and students to ensure the nature and level of parental involvement and pressure is adaptive for learning and success may be beneficial. Additionally, equipping students with effective strategies to cope with the pressure they perceive they are experiencing may be valuable. Throughout the qualitative interviews, the academically selective students highlighted that their schoolmates acted as a buffer to the intense competition and parental pressure, an asset which should be harnessed alongside the lessening of pressure, to ensure our high achievers are reaching their full potential.

Summary of Parental Relations self-concept and Parental pressure to achieve findings. The findings of the present study demonstrated that quantitatively, selective school students possess significantly lower Parental Relations self-concepts than their equally high achieving counterparts within mixed-achievement settings. These more negative relations with their parents are of importance, since positive relations are integral for the development of well-rounded adolescents and the facilitation of positive wellbeing outcomes. Given that selective students have poorer Mathematics, English, General School, and Parental Relations self-concepts, the findings imply that selective schools and their students would benefit from interventions that target the building of more positive self-perceptions, and more adaptive student-parent relationships.

The statistical data showed no significant differences between high achievers located within different achievement contexts in terms of Parental pressure to achieve—both groups reported equally high levels. Rather, the qualitative data was again instrumental in illuminating that differences in pressure to achieve from parents may be culturally based. The focus group interviews revealed that students of self-identified Asian Australian heritage perceived that compared to Anglo Australian high achievers, their parents: held higher expectations for their achievement; recognised perceived failures more than perceived successes;

prescribed specific standards of achievement; had higher career expectations for them; and placed greater pressure to achieve on them.

Driven by the qualitative findings, the differences between non-Anglo and Anglo heritage students were analysed post-hoc, and corroborated these results. Specifically, non-Anglo students reported significantly lower relations with their parents, and significantly higher pressure to achieve from their parents than Anglo heritage students. Cross-cultural research that has highlighted differences in cultural and sociological values regarding education, and the resultant implications of these variables for parenting beliefs and strategies, were put forth as potential explanations for these differing findings.

The findings pertaining to the reciprocal relations between Parental Relations self-concept and academic achievement were largely non-significant, and in keeping with prior research. However, less adaptive relations with parents may have implications for students' future wellbeing. Additionally, Parental pressure to achieve was statistically found to have no effect or detrimental effects on achievement outcomes. It may be that pressure does not result in improved academic performance as desired, or may be linked to cultural differences in the function of pressure. Furthermore, the impact of such pressure for students' psychosocial wellbeing is not known.

Taken together, the findings imply that selective schools should focus on building more positive parent-child connections, and that both schooling settings could benefit from interventions aimed at forming more positive parental involvement in students' school lives. High achieving students' achievement and wellbeing may also be enhanced by the employment of strategies to manage the pressure and expectations they experience. Quantitative and qualitative research regarding the differential impact of contrasting school settings, and furthermore contrasting cultural backgrounds, for high achievers' relations with, and pressure to achieve from their parents is scarce. Hence, the current study has contributed to this limited body of research in considering the implications for high achievers' wellbeing, beyond academic achievement.

This sub-section has presented the quantitative and qualitative findings pertaining to the influence of parents on high achievers' school lives. The next sub-section turns to the influence of teachers.

The Influence of Teachers

The impact of differing educational settings on Teacher pressure to achieve. Answering the research questions posed regarding the impact of differential school contexts for experiences of pressure to achieve from teachers, the quantitative data showed that holding constant SES, culture, and prior academic achievement, there were no significant differences between selective students, high achieving comprehensive students, and other achieving comprehensive students throughout the school year. Additionally, levels of pressure to achieve from teachers were substantially lower than those uncovered for parental pressure.

Indeed, in support of and extending upon these results, the qualitative data revealed that rather than placing pressure on students to achieve, teachers within both school contexts were identified by the high achievers as a vital asset to their school lives. The students spoke of the key role played by their teachers as an integral component in their learning, understanding, and achievement. Specifically, all high achievers identified the characteristics of their quality teachers: they possessed thoroughness and knowledge of their subject; were skilled at monitoring and evaluating student progress; they effectively utilised class interaction to aid learning they provided fast and constructive feedback on work and exams; they interacted and engaged with students in a manner that engaged their interest they were adept at creating the optimal classroom environment for learning; and they were invested in their learning. These characteristics are highly consistent with the qualities of exemplary teachers identified by Munns, Sawyer, and Cole (2013). The high achieving students within the selective and mixed-achievement settings did not experience pressure to achieve from their teachers, but rather perceived them as dedicated to their success.

These findings are critical, given that Hattie (2003) concluded that apart from the student themselves, teachers account for the next most important amount of variance in explaining students' academic success. The lack of statistical evidence for pressure to achieve from teachers, substantiated and explained by the qualitative findings that highlighted the quality teachers contained within the schools sampled, supports a body of research that has shown the immense adaptive implications of effective teachers. For example, teachers who are passionate about their students' learning and achievement, hold high expectations for their students, challenge their learning, and set high standards for work, help to produce the most positive

outcomes not only for high achievers, but for students of all levels of achievement (Hattie, 2003; Ford & Trotman, 2001; Munns, Sawyer, & Cole, 2013). This was certainly the case in the present investigation. The findings imply that across both academically selective and mixed-achievement comprehensive settings, quality teaching is pivotal for enabling and enriching high achieving students' school lives.

The reciprocal relations between Teacher pressure to achieve and academic achievement. The findings in relation to the existence of reciprocal relations between Teacher pressure to achieve and Mathematics and English achievement across time, were again largely non-significant. The statistical data demonstrated that for all students, prior pressure to achieve from teachers did not significantly relate to later achievement in Mathematics, and prior Mathematics achievement was not a significant predictor of subsequent experiences of pressure to achieve from teachers.

For selective students, Time 1 Teacher pressure to achieve was significantly negatively related to later Time 2 Spelling achievement. The Wald test indicated that the strength of this path was similar to the negative beta path found for the high achieving comprehensive school students, but was significantly different to the positive path found for the other achieving comprehensive school students. Hence, the negative impact of pressure on Spelling may not be present for lower achievers. For all students, Time 1 Teacher pressure did not significantly predict Time 2 Sentence Comprehension achievement, and both facets of Time 1 English achievement were not significantly related to later pressure to achieve from teachers.

Similarly to Parental pressure to achieve, Teacher pressure to achieve had little impact on academic success for high achieving students. Additionally, the qualitative component of this study was instrumental in illuminating that the high achieving students did not define their teachers in terms of pressure, but rather considered the qualities of their teachers that were vital for their learning, understanding, and achievement. Hence, it is these aspects of quality teaching, identified by students across both selective and mixed-achievement settings that the students explained were positively linked to their future academic attainments. Taken together, these findings support Hattie's (2003) meta-analysis, and recent research on exemplary teachers by Munns, Sawyer, and Cole (2013), which concluded that teacher knowledge, action, and dedication is a powerful force in the learning equation.

Summary of Teacher pressure to achieve findings. High achieving students, irrespective of their educational setting, did not differ in terms of pressure to achieve from teachers. Furthermore, the data indicated that levels of this construct were low, and substantially less than those reported for pressure to achieve from parents. This was the first study to investigate the construct of pressure in selective and mixed-achievement NSW schools. The results imply that the construct of Teacher pressure to achieve did not accurately encapsulate high achieving students' experiences of their teachers. Instead, the focus group interviews revealed that teachers were instead framed in terms of "quality teachers", possessing many skills and characteristics that high achieving students believed were a core ingredient of their academic attainments. Quality teachers were an asset to both educational settings, and the results ultimately demonstrated the power of teachers for student success.

Mental Health

The impact of differing educational settings on Depression and Anxiety.

The quantitative results revealed that high achieving students located within the selective educational setting were no more depressed on average, than their high achieving peers located within the mixed-achievement setting throughout the school year. Furthermore, high achieving and lower achieving comprehensive students had statistically similar and low levels of Depression at both points of testing.

In regard to Anxiety, the statistical findings demonstrated that controlling for variances in SES and cultural background, high achieving comprehensive students were significantly more anxious than selective students at Time 1. However, by Time 2 the results were reversed, with selective students becoming significantly more anxious than the high achieving comprehensive students. Within the mixed-achievement setting, the lower achieving students reported significantly higher levels of Anxiety at both time waves, and the magnitude of the difference increased throughout the school year. However, the effect sizes for these latter differences were small.

The focus group interview data enriched the above quantitative findings, again providing a more specific explanation and understanding of high achieving students' experiences of Depression and Anxiety. Within the interviews, students framed these constructs as school life worries and difficulties. This was a much more nuanced and particular image than was assessed via quantitative means, which

measured negative emotional states in relation to everyday life over the past week. Specifically, the qualitative data illuminated that whilst high achieving students in both settings communicated similar instances surrounding when they felt bad, or worried about attending school, academically selective students reported a greater intensity in such experiences. Worries were principally related to: exam day pressure; the return of student results; the perceived overload of assignments before reports; and the distribution of student reports to parents.

Underscoring all of these experiences, the pressure to do well from parents, the ranking of students, and the comparison amongst very highly achieving classmates, generated a state of heightened emotion and worry for the selective students. In particular, the practice of receiving marks in front of classmates was a daunting experience for selective students, and served to add to the already competitive nature of the school. This practice of reading out marks meant that comparison with other students' results was made even more explicit and salient. It is these comparisons within selective settings that quite possibly lead to lowered self-concepts, and low self-concepts were principally evident for the selective students within this study. For the students located in the mixed-achievement setting, the lower presence of competition amongst students due to the greater array of achievement levels available for comparison, appeared to lead to a less pressurised and less intense atmosphere of tension.

The statistical data demonstrated that over the course of the school year, selective students' levels of Anxiety became significantly higher than their high achieving counterparts in the comprehensive setting. Furthermore, the focus group interviews conducted at the end of the school year revealed that selective students experienced greater worries related to academic life, which were shaped by the competitive school environment and pressure from parents. These findings are concerning given that good mental health is linked with school success (Puskar & Bernardo, 2007; Sznitman, Reisel, & Romer, 2011), and poor mental health is associated with increased risk of later major depression, anxiety disorders, nicotine dependence, alcohol dependence, suicide attempts, educational underachievement, unemployment, homelessness, increased risk of incarceration, and misuse of drugs (Fergusson & Woodward, 2002).

Much of the research regarding mental health outcomes for high achieving students has focused on comparing GAT students with non-GAT students, rather

than comparing high achievers across differing school contexts. The most recent of this research has found that overall, gifted students are not reliably different from their non-gifted peers in terms of anxiety and mental distress (Martin et al., 2010; Zeidner & Shani-Zinovich, 2011). Hence, the findings of the present study imply that when comparing equally high achieving students, some within the heightened academic environment of the selective setting may experience more negative mental health outcomes.

Given the qualitative findings, the present investigation may have more accurately captured students' experiences of Depression and Anxiety statistically, if a more suitable measure that directly assessed worries specifically in relation to school life events was employed. Additionally, as the sample utilised in the present investigation was comprised of a significant proportion of students of Asian Australian heritage, psychological scales developed in the Western context may not be optimal scales for use with Confucian Asian students (Hau & Ho, 2010).

Indeed, research has shown that two components of a Depression scale identified in the Confucian Asian participants are not typically found as salient aspects of depression in Western culture (Woo et al., 2004). The first component, called "socially oriented self-evaluation", relates to concerns about social harmony. The second component, called "cognitive inefficiency", is connected to concerns about school performance and career, and emerged as the most prominent worry for most Confucian Asian students. Hence, the scales employed to measure Depression and Anxiety in the present investigation may have lacked the specificity in directly assessing school and achievement related stressors, and may also not have encapsulated culturally relevant aspects of Depression and Anxiety.

The reciprocal relations between Depression, Anxiety, and academic achievement. In response to the research questions regarding the presence of reciprocal relations between the mental health constructs of Depression and Anxiety, and the Mathematics and English achievement outcomes, the findings demonstrated that except for one path, all other relations were non-significant. Specifically, prior Depression was not a significant predictor of later Mathematics, Spelling, or Sentence Comprehension achievement, or vice versa across all student groups.

For all students, Time 1 Anxiety was not significantly related to Time 2 Mathematics, Spelling, or Sentence Comprehension achievement. For selective students, higher Mathematics achievement at Time 1 was significantly linked to

lower Anxiety at Time 2, and the Wald test indicated that this path was significantly different to the positive paths found for both groups of comprehensive students. Lastly, prior Spelling and Sentence Comprehension achievement did not impact subsequent Anxiety, and this was consistent for selective, high achievement comprehensive, and other achievement comprehensive students.

The lack of significant relations between mental health variables and academic achievement is surprising, given that extensive research has documented the link between good mental health and school success (Puskar & Bernardo, 2007; Sznitman, Reisel, & Romer, 2011). As discussed above, the lack of significant reciprocal relations may be explained by the generality in the measures employed to assess Depression and Anxiety. As the qualitative data showed, high achieving students experience emotional distress, anxiety, and worry in relation to specific school and academic occurrences. Additionally, the diverse cultural backgrounds of the student sample may have also influenced the lack of significant results found. It must be highlighted that the impact of the greater worry experienced by selective students for their achievements beyond high school and into university, are not known. Nor is the impact of the increased emotional state for other vital educational outcomes such as motivation, or buoyancy known.

Summary of Depression and Anxiety findings. The quantitative findings demonstrated that high achieving students located within differing achievement contexts did not differ in terms of Depression. At the commencement of the school year, high achievers from comprehensive schools reported significantly higher Anxiety, however, by the end of the school year selective students reported significantly worse anxious tendencies. The qualitative findings were instrumental in showing that the mental health instruments utilised may not have captured the full story of effect of differential achievement contexts for high achieving students' mental health outcomes.

Specifically, the interviews revealed that anxiety and worry for all high achieving students was explicitly linked to academic events, including exam day, the return of results, scheduling of assignments, and the circulation of reports to parents. Overall, what emerged was that the intense environment of competition and comparison, coupled with the pressure to achieve from parents within the selective setting, heightened the negative emotional and wellbeing impact of these events for selective students. Although some students within the comprehensive setting also

faced immense pressure to achieve from parents, the lower achievement context meant that social comparison had less of a detrimental emotional impact for these students.

The findings imply that selective schools may generate improvements in their students' psychosocial wellbeing outcomes by considering methods to reduce the competition within the school environment, and engaging strategies to lessen the negative implications of these processes. Certainly, these results once again demonstrate whilst some high achieving students may flourish within the academically selective context, not all high achieving students may benefit from this educational provision.

With the quantitative and qualitative findings in relation to the impact of differing schooling contexts for achievement and psychosocial wellbeing, the reciprocal relations between the wellbeing constructs and achievement across time, and the role of cultural heritage in influencing select student outcomes now discussed, the next main section attends to the strengths and limitations of the present investigation.

Strengths and Limitations of the Present Investigation

Strengths of the Present Investigation

As highlighted at the beginning of this thesis, Robinson (2006) emphasised the lack of research into gifted education in Australia, stating, "we really have very few well-controlled investigations pitting one approach against another or even one approach against business as usual" (p. 342). The overarching strength of the present investigation is that it is the first of its kind in Australia to specifically compare high academic achievers in selective schools with high academic achievers in mixed-achievement comprehensive schools across a range of academic, educational, and psychosocial wellbeing outcomes.

The present investigation is also innovative in that it uncovered the individual characteristics that served to enhance or impede students' psychosocial wellbeing and academic success across time, and the differential operation of these relations for contrasting schooling contexts. It furthermore highlighted the direct perspectives and experiences of high achieving students via interviews, and unexpectedly revealed that cultural heritage, alongside educational context, plays an integral role in shaping students' academic success and emotional wellbeing.

In doing so, the research has identified how differential educational provisions impact, both positively and negatively, high achievers' academic success and wellbeing, longitudinally. Moreover, the investigation has uncovered how psychosocial determinants (i.e., academic self-concept, academic buoyancy, the influence of significant others, and mental health constructs) serve to underpin and impact high achievers' life outcomes. Importantly, this research has also identified cultural differences regarding high achieving students' school life experiences, and how these aspects differentially drive student success. This generation of knowledge will allow for targeted intervention across the domains of self-concept, parental relations, parental pressure to achieve, within-school competition, and anxiety.

There is a paucity of research that has examined these issues thus far, with most of the research being dated, and criticised for methodological issues, such as a failure to include appropriate groups for comparison, a failure to account for pre-existing students differences on important variables such as prior achievement, SES, and cultural background, and the consideration of limited student outcomes beyond academic achievement. By methodologically addressing these issues in the present study, this research contributes substantial integrity to the study of this educational issue. Additionally, the present investigation was able to add to and enrich the already extensive field of BFLPE and REM theory and research, with a unique contribution regarding the operation of these effects within selective and comprehensive school contexts.

Indeed, woven beneath the overarching strength of the present investigation is a more specific set of strengths that, together, combine to ensure that the overall contribution of this research is of value. Specifically, a key strength of this investigation was the rigorous attention paid to the psychometric validation of all instruments, and the attention paid to within-construct issues before proceeding to between-construct concerns. Particularly in relation to the limited research regarding the selective schools in Australia, this study offers a unique contribution to the literature in that it demonstrates the psychometric soundness of the instrumentation and the salience of these measures for high achieving students, upon which the research findings are based.

Additionally, the use of Mplus (Muthén & Muthén, 2008) to conduct the statistical analyses in the present investigation is an asset, as measurement error was taken into consideration within all models (Byrne, 2011). Alternative methods (e.g.,

those based in regression or the general linear model) essentially assume that error or errors attached to the independent variables vanish. Hence, as Byrne (2011) argues, applying such methods that do not account for measurement error when there is error in the explanatory variables, may lead to serious inaccuracies. Such errors were avoided with the use of Mplus more broadly, and SEM more specifically.

Perhaps the strongest aspect of the present investigation was the utilisation of a mixed methods research design. The combination of quantitative and qualitative data collection and analysis techniques allowed a more enriched and nuanced perspective of the issues under study, than would have been generated by either research method alone. The contribution and value of the mixed methods approach was no more evident than in the present investigation, whereby the statistical findings often did not capture the complete story in regard to high achievers' experiences. The qualitative data illuminated a deeper and more specific understanding of all constructs considered in the present study, and was ultimately responsible for revealing the unanticipated importance of cultural heritage for high achievers' academic and wellbeing outcomes. Ultimately, the corroboration and divergence that was generated by the use of a mixed methods approach to research provided deeper perspectives, insights, and understandings into complex aspects of the research problem that have been previously unexplored.

Limitations of the Present Investigation

Notwithstanding the strengths of the current research outlined above, there were some limitations that must be considered when interpreting the results. The most important limitation is that whilst academic achievement was statistically controlled for, students were not specifically matched on achievement, and this may account for the magnitude of the achievement differences found in the present study. As outlined in the academic achievement section of this chapter, regression to the mean artefacts may have been caused by the selection criteria for this study, and may have resulted in biased estimates of school growth for the academically selective program (Marsh & Hau, 2002). Due to sample size, explicit matching of students was unable to be employed. Hence, future research could endeavour to explicitly match high achieving students in terms of their achievement.

Extending upon this, the current research is limited by the small sample upon which the findings are based, with only one selective school and four mixed-achievement comprehensive schools included. This restricted sample size meant that

multilevel modelling techniques that account for nested data could not be utilised. Furthermore, due to the restricted sample size, the findings may not generalise to all selective and comprehensive schools within NSW, and to all students of Asian Australian cultural heritage. Future research that expands on the present investigation could ensure a much larger sample, from a more diverse range of schools to ensure generalisability.

As previously outlined, a standardised achievement test (WRAT4; Wilkinson & Robertson, 2006) was employed to assess students' academic performance in English and Mathematics. This test was chosen as standardised measures are considered more stable and more resilient to short-term changes in students' lives than school grades (Keith, 2002). This is because school grades tend to be idiosyncratic to each teacher, as they grade on a normal distribution (see Marsh, 1987a). Hence, even when there are considerable differences between classes and schools in terms of student ability, there is little difference between classes and schools in the average grade assigned by individual teachers.

In light of this, a standardised achievement test was utilised to measure student achievement in the present study, as the use of school grades would have resulted in little variation in the achievement levels between the selective and mixed-achievement students, even though achievement in the selective schools would have been higher. Despite this rationale, the use of the WRAT4 to measure achievement held its own limitations. Specifically, at the time the present investigation was conducted, the WRAT4 was one of very few standardised achievement tests available that had been validated for use with secondary students. Moreover, a ceiling effect in achievement scores on the WRAT4 was evident for some of the very highly achieving students in the present study. Hence, the true extent of the students' capabilities may have been underestimated. Future research should endeavour to develop a more appropriate achievement measure for use with high achieving students.

Another potential issue is that not all of the psychological outcome measures utilised in the present investigation may have been the most appropriate for uncovering the true nature of the construct being assessed. For example, the Depression and Anxiety measures were too global in their definition, and more precise questions in relation to school-based academic events would have been appropriate. Future research could address this problem by employing more relevant

measures as previously highlighted, and furthermore considering other important constructs such as motivation that were not included in the present study.

Lastly, the emergence of the cultural heritage of high achieving students as playing as important a role as differing school contexts for their academic achievement and psychosocial wellbeing, was unanticipated. Care should be emphasised in making cross-cultural comparisons, as self-report measures could carry different meanings in different cultures. Also, broad comparisons across cultural groups fail to account for within-group cultural differences and nuances. Indeed, the term “Asian” is a very broad ethnic descriptor, such that care must be taken in generalising the findings to the many diverse Asian heritages.

However, the discovery of similarities and differences in the application of existing theories in different cultures provides the chance to revise, accommodate, and expand those theories, so that they can become more accurate and more comprehensive (Pintrich, 2003). As Ho and Hau (2010) note, despite the care that must be exercised when making cultural comparisons, more research and discussions regarding cultural phenomena with the aim to promote students’ healthy development should be encouraged, particularly those generating new perspectives and frameworks of investigation.

In sum, the strengths and contributions of the present investigation, alongside the limitations and suggested directions for future research to redress them, have been outlined. The final section of this chapter discusses the central implications of the findings for measurement, theory, research, and practice.

Implications of the Present Investigation

As the specific implications of the findings have been presented throughout the discussion above, this section instead outlines a perspective of the broad implications of the research project for measurement, theory, research, and practice.

Implications for Measurement

Given the paucity of methodologically sound research to investigate academically selective schools within NSW, the research generated by the present investigation makes a significant and vital contribution to advancing GAT research from a theoretically derived measurement perspective. Prior studies have been criticised for their lack of multidimensional measures, failure to control for student-level differences, lack of inclusion of comparison groups, and an almost sole focus on academic achievement with little consideration of other affective outcomes that

are important for students' health and wellbeing. The present study attempted to overcome each of these issues, and hence contribute a conceptually, methodologically, and theoretically considered body of research to extend GAT literature within Australia, and internationally.

More generally, the attention to within-construct issues in the present investigation has ensured that the data upon which the research conclusions are based, are derived from a suite of instruments validated for use with the particular sample of students surveyed. This is principally important for research, as there tends to be a greater focus on between-construct issues, rather than the within-construct validation of instruments. The demonstrated normality, reliability, validity, and appropriateness of the measures regardless of gender, year level, or school setting, provides a solid foundation to assist future research and practice in GAT contexts.

Implications for Theory

The main theoretical underpinnings that drove the present investigation are the BFLPE (Marsh & Parker, 1984), associated comparison theories encompassing social (Festinger, 1954; Marsh, 1987a), temporal (Albert, 1977; Rheinberg, 2006), dimensional (Marsh, 1986; Marsh & Hau, 2004; Möller & Köller, 2001; Möller & Marsh, 2013; Möller et al., 2009), and criterion-oriented comparisons (Jonkmann et al., 2012), and the REM (Marsh, 2007b; Marsh & Craven, 2006; Marsh & O'Mara, 2008; Seaton, Parker, et al., 2014; Valentine & Dubois, 2005). Despite the prolific nature of research that has provided support for these theories for decades, there were gaps identified in the published research that the current investigation attempted to address.

In relation to the BFLPE, the majority of research in Australia is dated, and it has been conducted almost exclusively with primary school students (Craven et al., 2000; Marsh, Chessor, Craven & Roche, 1995; Marsh & Parker, 1984), with the single high school study not specifically considering selective schools (Marsh, 2004). Hence, although not an explicit test of the BFLPE, the present investigation has made a significant contribution to BFLPE theory by providing evidence for the negative impact of a high school-average achievement level within NSW academically selective schools. Furthermore, by considering both Mathematics and English domains within the same study, the findings have contributed a multidimensional perspective to the body of BFLPE research, which is often criticised for focusing on a single academic domain. That the BFLPE was

investigated both quantitatively and qualitatively also provides a rare, mixed method insight into the operation of this effect.

Furthermore, frame of reference processes utilised by students to formulate their evaluations of their academic performance have been shown to underlie the BFLPE. The qualitative component of the present investigation was integral in highlighting the first-hand operation of these comparison processes in the development of students' academic self-perceptions. Specifically, the current study demonstrated that not only do selective students possess lower academic self-concepts than their equally achieving counterparts in mixed-achievement schools, but the qualitative data allowed high achieving students to explain the social comparison mechanisms that underlie these lowered perceptions.

With regard to the role of the causal relation between prior academic self-concept and subsequent academic achievement, it is surprising that BFLPE research typically cites REM findings to support that the lowered self-concepts found in BFLPE studies would logically lead to lowered achievement levels, without explicitly testing for this connection within the same study. Hence, the present study has contributed to REM research by conducting a comparison of the impact of academically selective and mixed-achievement school settings on academic self-concept, and examining the ensuing relations between academic self-concept and academic achievement for high achieving students located in differing schooling contexts, within the same sample.

Despite the extensive body of research to support the REM across a diversity of research contexts, there was a gap in the published research for studies examining whether the REM is upheld within the high achievement framework. The findings of the present investigation revealed that whilst the reciprocal relations between Mathematics self-concept and Mathematics achievement were upheld for high achieving students, irrespective of their schooling context, potentially distinct patterns of achievement and self-concept relations in the domain of English could be present across different school settings, and different cultural backgrounds. That English self-concept and English achievement were not positively related for selective students, and for students of Asian Australian heritage, has crucial implications for the academic success and wellbeing of our high achievers. Indeed, programs aimed at enhancing students' perceived competency in English, and a deeper engagement with this domain would be beneficial.

Implications for Research

There has been limited research to explicitly evaluate the Australian selective school model as the primary governmental measure employed to enable high academic achievers to reach their full potential. Specifically, the present study is the first of its kind to examine: (a) the tangible impact of different types of educational provision on students' academic achievement and psychosocial outcomes; (b) the factors that serve to enhance or impede the psychosocial wellbeing and academic attainments of high achievers, and how these may vary across diverse educational settings and achievement levels; (c) how the unique cultural heritage composition of the school and the student body may also be an influential element woven into the fabric of students' school lives; and (d) students' first-hand perceptions and experiences of differing academic milieu.

The findings have ultimately revealed that selective settings do offer a highly intensive academic environment that results in more negative Mathematics, English, and General School self-concepts, the possibilities of increased parent-child tensions, a heightened experience of comparison and competition, and greater academic event-related anxiety for some of the students who attend them. Given that the selective school issue in NSW has remained unresolved amongst governments, policy makers, academics, educators, and parents for many decades, the present investigation has contributed research evidence to this critical educational debate of our time.

Additionally, the present investigation has significant implications for linking GAT and cross-cultural research. Unexpectedly, the qualitative data was instrumental in revealing that the cultural heritage of students, and the related influence of parents, were vital considerations in the fostering of student academic success and psychosocial wellbeing. Ultimately, the findings imply that future research within the GAT framework must also consider cultural heritage, alongside schooling context, to fully encapsulate the variables that are major explanatory forces in students' school lives.

Implications for Practice

There were a myriad of implications for educational policy and practice that emanated from the present study. Firstly, although some high achieving students may flourish within academically selective settings, the present results imply that high achieving students who already possess lower self-perceptions and academic buoyancy, and are less able to cope with the intense academic environment of

competition, comparison, and heightened anxiety, and hence may be more suited to a mixed-achievement setting. As such, the selective school selection process could assess students on more criteria than just their academic capabilities, including each individual student's personality, characteristics, and their psychological capabilities to deal with the academically selective environment.

Additionally, for those high achieving students within the academically selective setting, interventions targeted at enhancing academic self-concept and ensuring more positive parent-child relations are vital to ensure that our high achievers are not only succeeding academically, but also developing a strong psychosocial wellbeing for their school years and beyond. The selective school environment is one that is characterised by immense competition and close comparison amongst students, which may be exacerbated by practices that explicitly promote student comparison (e.g., public dispersion of exam marks). Hence, strategies to reduce the high levels of competition to a more healthy and adaptive presence would be of benefit. Student engagement strategies like peer and group self-assessment that emphasise a community of learners, may be helpful in reducing the intensity of competition (Munns, Sawyer, & Cole, 2013). In addition, reducing direct comparison to peers' results would be useful.

Furthermore, pressure to achieve from parents was a significant influence on high achievers' school lives, and may not result in the desired positive effects on academic achievement. Indeed, pressure to achieve from parents was culturally based, and experienced by high achievers of Asian Australian descent to a much greater extent than Anglo Australian heritage students. The findings imply that both educational settings would benefit from a whole school approach to ensuring adaptive parental involvement. More research is also needed regarding the emic and etic processes that underlie the differential cultural effects of parental involvement. Also, research that does not lump all Asians into the same ethnic/cultural basket, but rather looks to understand the diversity across the group as it interacts with Australian educational contexts is vital.

Chapter Summary

This chapter has outlined the key findings of the three studies that comprise the present investigation. Firstly, the results pertaining to the reliability, validity, and invariance of the multidimensional scales utilised were discussed. Secondly, the

quantitative and qualitative findings pertaining to the main study aim of assessing the differential impact of contrasting educational provisions for high academic achievers were discussed interactively, generating new insights and drawing together the specific implications of this research in the context of prior theory and research. Next, the strength and limitations of the investigation's research design were presented alongside suggestions for future research. Lastly, the overarching implications of present study for measurement, theory, research, and practice were outlined. The next and final chapter of this thesis will summarise the key conclusions of the current investigation.

CHAPTER 10 CONCLUSION

The present investigation sought to assess the impact of attending differential school settings (academically selective and mixed-achievement comprehensive) on the academic achievement and psychosocial wellbeing of high achieving students. The theoretical perspectives of, and research in relation to, the BFLPE, comparison, and the REM, were the primary drivers of the present investigation. However, despite the prolific nature of this research, few studies have evaluated and compared the impact of attending a selective school in contrast to a mixed-achievement school in NSW in relation to academic achievement and academic self-concept. Furthermore, the impact of the academically selective environment on other vital wellbeing factors, specifically academic buoyancy, relations with parents, pressure to achieve from parents, pressure to achieve from teachers, depression, and anxiety, has been absent within the literature.

Harnessing a synergistic, mixed method, longitudinal design, the present study aimed to redress this gap in the research by examining high achieving students across a range of significant educational and wellbeing outcomes. The overarching conclusion from the current investigation was that in comparison to high achieving students located within mixed-achievement settings, selective students possess lower Mathematics, English, and General School self-concepts, have more complex and potentially strained relationships with their parents, and experience greater worries about everyday school life. This is principally related to the intense academic environment within the selective setting, which is typified by heightened competition and comparison amongst students, and pressure to achieve from parents. Hence, selective schools may not be suitable for all high achieving students, and those students who do attend may benefit from interventions to enhance these wellbeing domains, alongside their academic performance.

Furthermore, the present study was instrumental in revealing many substantial cultural heritage interactions with school setting, such that just considering school context or academic achievement level in isolation, does not tell

the complete story in relation to high achieving students' wellbeing. More specifically, those students of Asian Australian heritage across both school settings held lower academic perceptions, experienced greater pressure to achieve from parents, and had more negative relations with their parents than Anglo Australian students. Thus, future programs and interventions need to take an inclusive approach, encompassing the school, students, and parents.

Informing this overarching conclusion is a more specific set of yields emanating from this program of research, including:

(a) developing a body of research that has verified the psychometric stability of the instruments utilised, controlled for pre-existing student-level differences in important variables, included appropriate comparison groups to enhance methodological rigour, and employed appropriate statistical analysis techniques;

(b) enriching previous BFLPE, comparison, and REM theory and research by demonstrating the impact of differing achievement contexts for high achieving students' academic achievement and self-concept, and the subsequent relations between these constructs within each setting;

(c) extending the limited body of previous research to investigate the selective schooling model, by explicitly evaluating NSW selective and mixed-achievement comprehensive environments in terms of their positive and negative implications for high achievers across a range of psychosocial wellbeing outcomes;

(d) revealing the role played by cultural heritage for high achievers' educational and wellbeing outcomes, alongside that of school setting;

(e) underscoring the strength and contribution of a mixed methods approach to conducting research;

(f) highlighting implications for educational and psychological measurement, theory, research, and practice; and

(g) suggesting further perspectives for researchers, educational stakeholders, policymakers, teachers, and parents, to facilitate the academic success and psychosocial wellbeing of students.

In conclusion, the findings from the present investigation make a substantial contribution to GAT education literature internationally, and have given to the research field an empirical Australian study that addresses a significant and understudied educational issue of our time.

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APPENDICES

Appendix A

Student Consent Form and Quantitative Survey



Purpose

The purpose of this survey is to help to find out what you think about your schoolwork, yourself, your school and others. Your participation in the study is voluntary and you can withdraw from the study at any time. Not participating in the study will not affect your relationship with your school.

This is not a test. **There are no right or wrong answers and everybody will have different answers. Just make sure that your answers show what you really think about yourself. I will read the questions aloud to you and explain how to answer each one.** There are some questions that seem the same. This is not a trick. **It is just that this type of survey needs to ask questions in slightly different ways. Just answer them in a way that shows what you really think about yourself.**

Your answers will only be seen by the researchers and will not be shown to anyone in your school or your community. The researchers will remove the consent form you sign below and store this separately. The research team will not report the names of students or schools that participate in the study.

Student Consent

Student Consent Form to Participate in Research Study

Student's Name: _____

Date of birth: ____/____/____

I agree to participate in the study

Signature: _____

Today's date: _____

SCH CLS ST

Your Background

1 What is the name of your school? _____

2 What Year are you in at school? (eg., Year 8)_____

3 What class are you in for **maths**? _____

4 What is the name of your **maths** teacher?_____

5 What class are you in for **English**?_____

6 What is the name of your **English** teacher?_____

7 Are you male or a female?
Please tick one box.

1 ☐ Male
2 ☐ Female

8 Did you sit the Selective Schools Test?

1 ☐ Yes (Go to question 9)
2 ☐ No (Go to question 11)

9 Were you offered a place in a selective school?

1 ☐ Yes (Go to question 10)
2 ☐ No (Go to question 11)

10 Did you accept the place in the selective school?

1 ☐ Yes What were your reasons for accepting the place at a selective school?
.....
.....

2 ☐ No What were your reasons for **not** accepting the place at a selective school?
.....
.....

11 Do you go to private tutoring?

1 ☐ Yes—How many hours week? _____
2 ☐ No

	PLEASE PUT 1 TICK UNDER EACH HEADING	12. Where were YOU born?	13. In which country was your MOTHER (OR FEMALE GUARDIAN) born?	14. In which country was your FATHER (OR MALE GUARDIAN) born?
1	Australia			
2	China			
3	Croatia			
4	Fiji			
5	Greece			
6	Hong Kong			
7	India			
8	Indonesia			
9	Italy			
10	Korea			
11	Lebanon			
12	Macedonia			
13	Malaysia			
14	New Zealand			
15	Philippines			
16	Singapore			
17	Sri Lanka			
18	United Kingdom			
19	United States			
20	Vietnam			
21	South Africa			
22	Other country: (Write country in columns)			

15. What language does your family speak the most at home? If you speak more than one language, please pick only one which you speak more of:

1 <input type="checkbox"/> English	2 <input type="checkbox"/> Arabic/Lebanese	3 <input type="checkbox"/> Cantonese	4 <input type="checkbox"/> Chinese
5 <input type="checkbox"/> Croatian	6 <input type="checkbox"/> Greek	7 <input type="checkbox"/> Indian	8 <input type="checkbox"/> Indonesian
9 <input type="checkbox"/> Italian	10 <input type="checkbox"/> Japanese	11 <input type="checkbox"/> Korean	12 <input type="checkbox"/> Macedonian
13 <input type="checkbox"/> Mandarin	14 <input type="checkbox"/> Samoan	15 <input type="checkbox"/> Serbian	16 <input type="checkbox"/> Sri Lankan
17 <input type="checkbox"/> Thai	18 <input type="checkbox"/> Tongan	19 <input type="checkbox"/> Vietnamese	

20 ☐ Other: Please write name of language spoken _____

What is the highest level of education that your parents/guardians have?
(Please circle one number for each parent/guardian)

	None	Primary School	Some High School	Completed High School	TAFE	University
Mother/female guardian	1	2	3	4	5	6
Father/male guardian	1	2	3	4	5	6

Which of the following do you have in your home?

(Please circle as many boxes as apply)

18	A desk to study at	YES	NO
19	A room of your own	YES	NO
20	A quiet place to study	YES	NO
21	A computer you can use for school work	YES	NO
22	Educational software	YES	NO
23	A link to the Internet	YES	NO
24	Your own calculator	YES	NO
25	Classic literature (e.g. Shakespeare)	YES	NO
26	Books of poetry	YES	NO
27	Works of art (e.g. paintings)	YES	NO
28	Books to help with your school work	YES	NO
29	A dictionary	YES	NO
30	A dishwasher	YES	NO
31	In your home do you have more than 100 books?	YES	NO

About Your School Work

For this section we will do a couple of example questions. When you are ready to begin, please read each sentence and decide your answer (You may read quietly to yourself as I read aloud.) There are six possible answers for each question - "Strongly Disagree", "Strongly Agree", and four answers in between. There are six numbers next to each sentence, one for each of the answers. Choose your answer to a sentence and circle the number that is the answer you choose. **DO NOT** say your answer out loud or talk about it with anyone else.

Examples

1	2	3	4	5	6
Strongly Disagree	Disagree	Mostly Disagree	Mostly Agree	Agree	Strongly Agree

1. I like to read comic books 1 2 3 4 5 6

Bob circled 6 for "Strongly Agree". This means that he really likes to read comic books. If Bob did not like to read comic books very much, he would have circled 1 for "Strongly Disagree" or 2 for "Disagree"

1	2	3	4	5	6
Strongly Disagree	Disagree	Mostly Disagree	Mostly Agree	Agree	Strongly Agree

2. In general, I am neat and tidy 1 2 3 4 5 6

Bob circled 4 for "Mostly Agree" because he is not very neat, but he is not very messy either.

If you want to change an answer you have marked you cross out the number you have circled and circle a new number on the same line. For all the sentences be sure that the number you circle is on the same line as the right sentence. You should have one answer and only one answer for each sentence. Do not leave out any of the sentences.

1	2	3	4	5	6			
Strongly Disagree	Disagree	Mostly Disagree	Mostly Agree	Agree	Strongly Agree			
1	I have always done well in maths .		1	2	3	4	5	6
2	I do my English work because I want my teacher to say nice things about me.		1	2	3	4	5	6
3	I do my school work because I want my teacher to say nice things about me.		1	2	3	4	5	6
4	Compared to others my age I am good at maths .		1	2	3	4	5	6
5	I do my English work because I want my teacher to think that I am smart.		1	2	3	4	5	6
6	Work in maths classes is easy for me.		1	2	3	4	5	6
7	I do my English work because I want to get good marks from my teacher.		1	2	3	4	5	6
8	I am hopeless when it comes to maths .		1	2	3	4	5	6
9	I do my English work because I want my teacher to be pleased with me.		1	2	3	4	5	6
10	I get good marks in maths .		1	2	3	4	5	6
11	I feel most successful when my friends and I help each other figure things out in maths .		1	2	3	4	5	6
12	I learn things quickly in maths .		1	2	3	4	5	6
13	It is helpful to put together everyone's ideas when working on an English project.		1	2	3	4	5	6
14	I do my school work because I want my teacher to think that I am smart.		1	2	3	4	5	6
15	I believe I am mentally tough when it comes to maths exams.		1	2	3	4	5	6
16	In English I like to help other people do well in a group.		1	2	3	4	5	6
17	When I'm studying maths I don't let study stress get on top of me.		1	2	3	4	5	6
18	I do my best work when I work with other students in English .		1	2	3	4	5	6
19	I do my school work because I want to get good marks from my teacher.		1	2	3	4	5	6
20	I'm good at bouncing back from a poor maths mark.		1	2	3	4	5	6
21	I learn the most when I work with other students in English .		1	2	3	4	5	6
22	I do my school work because I want my teacher to be pleased with me.		1	2	3	4	5	6

1	2	3	4	5	6
Strongly Disagree	Disagree	Mostly Disagree	Mostly Agree	Agree	Strongly Agree
23	I think I'm good at dealing with school work pressures in maths				
			1	2	3
				4	5
					6
24	I like to work with other students in English .				
			1	2	3
				4	5
					6
25	I do well when I try to be the best student in my class.				
			1	2	3
				4	5
					6
26	I don't let a bad maths mark affect my confidence				
			1	2	3
				4	5
					6
27	I do well in English when I try to be the best student in my class.				
			1	2	3
				4	5
					6
28	Trying to do better than others makes me work well.				
			1	2	3
				4	5
					6
29	I'm good at dealing with setbacks in maths at my school (e.g. bad mark, negative feedback on my work).				
			1	2	3
				4	5
					6
30	Trying to do better than others in English makes me work well.				
			1	2	3
				4	5
					6
31	I work harder when I try to do better than other students.				
			1	2	3
				4	5
					6
32	I do my maths work because I like learning new things.				
			1	2	3
				4	5
					6
33	I work harder in English when I try to do better than other students.				
			1	2	3
				4	5
					6
34	I do my best work when I try to do better than other students.				
			1	2	3
				4	5
					6
35	I do my maths work because I enjoy figuring things out.				
			1	2	3
				4	5
					6
36	I do my best work in English when I try to do better than other students.				
			1	2	3
				4	5
					6
37	I learn the most when I try to do better than other students.				
			1	2	3
				4	5
					6
38	I do my maths work because I enjoy thinking hard.				
			1	2	3
				4	5
					6
39	I learn the most when I try to do better than other students in English .				
			1	2	3
				4	5
					6
40	I like trying to do better than other students.				
			1	2	3
				4	5
					6

1	2	3	4	5	6			
Strongly Disagree	Disagree	Mostly Disagree	Mostly Agree	Agree	Strongly Agree			
41	I do my maths work because I like to solve hard problems.		1	2	3	4	5	6
42	I like trying to do better than other students in English .		1	2	3	4	5	6
43	I feel most successful when my friends and I help each other figure things out.		1	2	3	4	5	6
44	I do my maths work because I enjoy trying to understand new things.		1	2	3	4	5	6
45	I do my English work because what we learn is really interesting.		1	2	3	4	5	6
46	It is helpful to put together everyone's ideas when working on a project.		1	2	3	4	5	6
47	I do my maths work because what we learn is really interesting.		1	2	3	4	5	6
48	I do my English work because I enjoy trying to understand new things.		1	2	3	4	5	6
49	I do my best work when I work with other students.		1	2	3	4	5	6
50	I like trying to do better than other students in maths .		1	2	3	4	5	6
51	I do my English work because I like to work out what the language means.		1	2	3	4	5	6
52	I like to help other people do well in a group.		1	2	3	4	5	6
53	I learn the most when I try to do better than other students in maths .		1	2	3	4	5	6
54	I do my English work because I enjoy thinking hard.		1	2	3	4	5	6
55	I do my best work in maths when I try to do better than other students.		1	2	3	4	5	6
56	I do my English work because I enjoy working with words and language.		1	2	3	4	5	6
57	I learn the most when I work with other students.		1	2	3	4	5	6
58	I work harder in maths when I try to do better than other students.		1	2	3	4	5	6
59	I do my English work because I like learning new things.		1	2	3	4	5	6
60	I like to work with other students.		1	2	3	4	5	6

1	2	3	4	5	6
Strongly Disagree	Disagree	Mostly Disagree	Mostly Agree	Agree	Strongly Agree
61	Trying to do better than others in maths makes me work well.				
			1	2	3
				4	5
					6
62	I'm good at dealing with setbacks in English at my school (e.g. bad mark, negative feedback on my work).				
			1	2	3
				4	5
					6
63	I do my school work because what we learn is really interesting.				
			1	2	3
				4	5
					6
64	I do well in maths when I try to be the best student in my class.				
			1	2	3
				4	5
					6
65	I don't let a bad English mark affect my confidence.				
			1	2	3
				4	5
					6
66	I do my school work because I enjoy trying to understand new things.				
			1	2	3
				4	5
					6
67	I like to work with other students in maths .				
			1	2	3
				4	5
					6
68	I think I'm good at dealing with school work pressures in English .				
			1	2	3
				4	5
					6
69	I do my school work because I like to solve hard problems.				
			1	2	3
				4	5
					6
70	I learn the most when I work with other students in maths .				
			1	2	3
				4	5
					6
71	I'm good at bouncing back from a poor English mark.				
			1	2	3
				4	5
					6
72	I do my school work because I enjoy thinking hard.				
			1	2	3
				4	5
					6
73	I do my best work when I work with other students in maths .				
			1	2	3
				4	5
					6
74	When I'm studying English I don't let study stress get on top of me.				
			1	2	3
				4	5
					6
75	I do my school work because I enjoy figuring things out.				
			1	2	3
				4	5
					6
76	In maths I like to help other people do well in a group.				
			1	2	3
				4	5
					6
77	I believe I am mentally tough when it comes to English exams				
			1	2	3
				4	5
					6
78	I do my school work because I like learning new things.				
			1	2	3
				4	5
					6
79	It is helpful to put together everyone's ideas together when working on a maths project.				
			1	2	3
				4	5
					6
80	I learn things quickly in English .				
			1	2	3
				4	5
					6
81	I do well in tests in most school subjects				
			1	2	3
				4	5
					6

1	2	3	4	5	6			
Strongly Disagree	Disagree	Mostly Disagree	Mostly Agree	Agree	Strongly Agree			
82	I'm good at dealing with setbacks at my school (e.g. bad mark, negative feedback on my work).		1	2	3	4	5	6
83	I feel most successful when my friends and I help each other figure things out in English .		1	2	3	4	5	6
84	I get good marks in English .		1	2	3	4	5	6
85	I don't let a bad mark affect my confidence.		1	2	3	4	5	6
86	I do my maths work because I want my teacher to be pleased with me.		1	2	3	4	5	6
87	I am hopeless when it comes to English .		1	2	3	4	5	6
88	I think I'm good at dealing with school work pressures.		1	2	3	4	5	6
89	I do my maths work because I want to get good marks from my teacher.		1	2	3	4	5	6
90	I am good at most school subjects		1	2	3	4	5	6
91	Work in English classes is easy for me.		1	2	3	4	5	6
92	I'm good at bouncing back from a poor mark in my schoolwork		1	2	3	4	5	6
93	I do my maths I work because I want my teacher to think that I am smart.		1	2	3	4	5	6
94	Compared to others my age I am good at English .		1	2	3	4	5	6
95	I don't let study stress get on top of me.		1	2	3	4	5	6
96	I do my maths work because I want my teacher to say nice things about me.		1	2	3	4	5	6
97	I have always done well in English		1	2	3	4	5	6
98	I believe I am mentally tough when it comes to exams		1	2	3	4	5	6
99	I get bad marks in most school subjects		1	2	3	4	5	6
100	I learn things quickly in most school subjects		1	2	3	4	5	6

About You

Please read each statement and circle a number, 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

0	1	2	3
Did not apply to me at all	Applied to me to some degree, or some of the time	Applied to me a considerable degree, or a good part of the time	Applied to me very much, or most of the time
1	I found it hard to wind down	0	1 2 3
2	I was aware of dryness of my mouth	0	1 2 3
3	I could not seem to experience any positive feeling at all	0	1 2 3
4	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1 2 3
5	I found it difficult to work up the initiative to do things	0	1 2 3
6	I tended to over-react to situations	0	1 2 3
7	I experienced trembling (e.g. in the hands)	0	1 2 3
8	I felt that I was using a lot of nervous energy	0	1 2 3
9	I was worried about situations in which I might panic and make a fool of myself	0	1 2 3
10	I felt that I had nothing to look forward to	0	1 2 3
11	I found myself getting agitated	0	1 2 3
12	I found it difficult to relax	0	1 2 3
13	I felt down-hearted and blue	0	1 2 3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1 2 3
15	I felt I was close to panic	0	1 2 3
16	I felt that life was meaningless	0	1 2 3
17	I felt I was not worth much as a person	0	1 2 3
18	I felt that I was rather touchy	0	1 2 3
19	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1 2 3
20	I felt scared without any good reason	0	1 2 3
21	I was unable to become enthusiastic about anything	0	1 2 3

22 What kind of job do you expect or plan to have when you are 30 years old?

 Write the job title.....

23 What kind of job do your parents expect you to have when you are 30 years old?

 Write the job title.....

24 As things stand now,
 how far in education
 do you think you will
 go? 1 ☐ Year 9
 2 ☐ Year 10
 3 ☐ Year 11
 4 ☐ Year 12
 Please tick the 5 ☐ TAFE course
 appropriate box 6 ☐ University degree
 7 ☐ Other (*please specify*) _____

Please read each statement and circle a number, 1, 2, 3, 4, 5 or 6 which indicates how much the statement applies to you.

1	2	3	4	5	6			
Strongly Disagree	Disagree	Mostly Disagree	Mostly Agree	Agree	Strongly Agree			
25	I often feel “fed-up”		1	2	3	4	5	6
26	I like mixing with other young people		1	2	3	4	5	6
27	I can let myself go and enjoy myself a lot at a lively party		1	2	3	4	5	6
28	I would rather be alone instead of being with other young people		1	2	3	4	5	6
29	I worry about things that might happen		1	2	3	4	5	6
30	I am easily hurt when people find things wrong with me or the work that I do		1	2	3	4	5	6
31	I expect that I will learn a lot		1	2	3	4	5	6
32	I often need kind friends to cheer me up		1	2	3	4	5	6
33	I am touchy about some things		1	2	3	4	5	6
34	I sometimes feel life is just not worth living		1	2	3	4	5	6
35	I always try to do the best work possible		1	2	3	4	5	6
36	My feelings are rather easily hurt		1	2	3	4	5	6
37	I often feel life is very dull		1	2	3	4	5	6
38	I often feel tired for no reason		1	2	3	4	5	6
39	I find it hard to get to sleep at night because I am worrying about things		1	2	3	4	5	6

1	2	3	4	5	6			
Strongly Disagree	Disagree	Mostly Disagree	Mostly Agree	Agree	Strongly Agree			
40	I worry for a long while if I feel I have made a fool of myself		1	2	3	4	5	6
41	I sometimes feel specially cheerful and at other times sad without any good reason		1	2	3	4	5	6
42	I would rather sit and watch than take part in social activities		1	2	3	4	5	6
43	I like to talk a lot		1	2	3	4	5	6
44	I tell myself that I can do better		1	2	3	4	5	6
45	I'd call myself easy-going		1	2	3	4	5	6
46	I like going out a lot		1	2	3	4	5	6
47	I have lots of friends		1	2	3	4	5	6
48	I find it hard to really enjoy myself at a lively party		1	2	3	4	5	6
49	I can get a party going		1	2	3	4	5	6
50	I am fun-loving		1	2	3	4	5	6
51	Other people think of me as being very fun-loving		1	2	3	4	5	6
52	I put pressure on myself to work harder		1	2	3	4	5	6

About Others

Please read each statement and circle a number, 1, 2, 3, 4, 5 or 6 which indicates how much the statement applies to you.

1	2	3	4	5	6
Strongly Disagree	Disagree	Mostly Disagree	Mostly Agree	Agree	Strongly Agree
1	I get along well with my parents				
	1	2	3	4	5 6
2	My teachers do not like it when I deliver careless work				
	1	2	3	4	5 6
3	My parents treat me fairly				
	1	2	3	4	5 6
4	My parents understand me				
	1	2	3	4	5 6
5	I do not like my parents very much				
	1	2	3	4	5 6
6	My parents want me to work hard				
	1	2	3	4	5 6
7	My teachers expect that I will learn a lot				
	1	2	3	4	5 6
8	My parents do not like it when I deliver careless work				
	1	2	3	4	5 6
9	My teachers tell me that I can do better				
	1	2	3	4	5 6
10	My parents expect that I will learn a lot				
	1	2	3	4	5 6
11	My teachers want me to work hard				
	1	2	3	4	5 6
12	My parents tell me that I can do better				
	1	2	3	4	5 6
13	My friends pressure me to work harder				
	1	2	3	4	5 6
14	My friends make fun of me if I do badly in an assessment				
	1	2	3	4	5 6
15	My friends tell me that I can do better				
	1	2	3	4	5 6
16	My friends expect that I will always get good marks				
	1	2	3	4	5 6

17 Thinking about Maths:

With which students (boy or girl) do you prefer to compare your marks in **Maths**? Write down the names of these **two** people, starting with the person who you most like to compare with. Then write down why you chose this person, for example: someone who is like me, good friend, good student, somebody I work with, someone who typically gets about the same mark as me, somebody who gets a better mark than me, someone who gets a worse mark than me.

Person 1

Surname.....

First Name.....

Reason.....

Indicate how much you agree with the following statements by ticking the box that best represents how you feel.

18 Has this student the same marks as yours in **maths**?

1 ☐ Never

2 ☐ Sometimes

3 ☐ One time out of two

4 ☐ Often

5 ☐ Always

19 Compared to this student in **maths**

1 ☐ Much worse

2 ☐ Slightly worse

3 ☐ The same

4 ☐ Slightly better

5 ☐ Much better

20 Person 2

Surname.....First Name.....

Reason.....

Indicate how much you agree with the following statements by ticking the box that best represents how you feel.

21 Has this student the same marks as yours in **maths**?

1 ☐ Never

2 ☐ Sometimes

3 ☐ One time out of two

4 ☐ Often

5 ☐ Always

22 Compared to this student in **maths**

1 ☐ Much worse

2 ☐ Slightly worse

3 ☐ The same

4 ☐ Slightly better

5 ☐ Much better

23 If you do not compare, tick this box: ☐

Explain why.....

24 How much better/worse are you in **maths** compared to most of your classmates?

1 ☐ Much worse

2 ☐ Slightly worse

3 ☐ The same

4 ☐ Slightly better

5 ☐ Much better

25	Who would you like to work with most in maths ? Write down the names of two people, starting with the person you most like to work with. Person 1 Surname.....First Name..... Person 2 Surname.....First Name.....
26	Who would you like to work with least in maths ? Write down the names of two people, starting with the person you least like to work with. Person 1 Surname..... First Name..... Person 2 Surname.....First Name.....

27	Thinking about English: With which students (boy or girl) do you prefer to compare your marks in English ? Write down the names of these two people, starting with the person who you most like to compare with. Then write down why you chose this person, for example: someone who is like me, good friend, good student, somebody I work with, someone who typically gets about the same mark as me, somebody who gets a better mark than me, someone who gets a worse mark than me. Person 1 Surname..... First Name..... Reason.....
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Indicate how much you agree with the following statements by ticking the box that best represents how you feel.

28	Has this student the same marks as yours in English ?	1 <input type="checkbox"/> Never 2 <input type="checkbox"/> Sometimes 3 <input type="checkbox"/> One time out of two 4 <input type="checkbox"/> Often 5 <input type="checkbox"/> Always
29	Compared to this student in English I am:	1 <input type="checkbox"/> Much worse 2 <input type="checkbox"/> Slightly worse 3 <input type="checkbox"/> The same 4 <input type="checkbox"/> Slightly better 5 <input type="checkbox"/> Much better

30	Person 2 Surname.....First Name..... Reason.....
----	--

Indicate how much you agree with the following statements by ticking the box that best represents how you feel.

3	Has this student the same marks as yours in English ?	1 <input type="checkbox"/> Never 2 <input type="checkbox"/> Sometimes 3 <input type="checkbox"/> One time out of two 4 <input type="checkbox"/> Often 5 <input type="checkbox"/> Always
3	Compared to this student in English I am:	1 <input type="checkbox"/> Much worse 2 <input type="checkbox"/> Slightly worse 3 <input type="checkbox"/> The same 4 <input type="checkbox"/> Slightly better 5 <input type="checkbox"/> Much better

33	If you do not compare, tick this box: <input type="checkbox"/> Explain why.....		
34	How much better/worse are you in English compared to most of your classmates?	1 <input type="checkbox"/> Much worse 2 <input type="checkbox"/> Slightly worse 3 <input type="checkbox"/> The same	4 <input type="checkbox"/> Slightly better 5 <input type="checkbox"/> Much better

35	Who would you like to work with most in English ? Write down the names of two people, starting with the person you most like to work with.	
	Person 1 Surname.....First Name.....	
	Person 2 Surname.....First Name.....	
36	Who would you like to work with least in English ? Write down the names of two people, starting with the person you least like to work with.	
	Person 1 Surname..... First Name.....	
	Person 2 Surname..... First Name.....	

About Your School

Please read each statement and circle a number, 1, 2, 3, 4, 5 or 6 which indicates how much the statement applies to you.

		1	2	3	4	5	6
		Strongly Disagree	Disagree	Mostly Disagree	Mostly Agree	Agree	Strongly Agree
1	My school has a good academic reputation	1	2	3	4	5	6
2	The academic standard of my school is high; many students want to get in.	1	2	3	4	5	6
3	It is well known that my school gets good results in public examinations.	1	2	3	4	5	6
4	The academic standard of my school is high; our school leavers obtain places in prestigious university courses.	1	2	3	4	5	6
5	The students and staff of the school think that this school is one of the best academically.	1	2	3	4	5	6
6	Academically I am proud to be part of this school.	1	2	3	4	5	6
7	I find it academically rewarding to be part of this school.	1	2	3	4	5	6
8	The academic standard of this school is disappointing to me.	1	2	3	4	5	6

Math Computation

Please write your answer in the appropriate space provided. A space for working out is provided on the next page.

- | | |
|-----------|-----------|
| 1. _____ | 21. _____ |
| 2. _____ | 22. _____ |
| 3. _____ | 23. _____ |
| 4. _____ | 24. _____ |
| 5. _____ | 25. _____ |
| 6. _____ | 26. _____ |
| 7. _____ | 27. _____ |
| 8. _____ | 28. _____ |
| 9. _____ | 29. _____ |
| 10. _____ | 30. _____ |
| 11. _____ | 31. _____ |
| 12. _____ | 32. _____ |
| 13. _____ | 33. _____ |
| 14. _____ | 34. _____ |
| 15. _____ | 35. _____ |
| 16. _____ | 36. _____ |
| 17. _____ | 37. _____ |
| 18. _____ | 38. _____ |
| 19. _____ | 39. _____ |
| 20. _____ | 40. _____ |

Spelling

Please write your answer in the appropriate space provided.

- | | |
|-----------|-----------|
| 1. _____ | 22. _____ |
| 2. _____ | 23. _____ |
| 3. _____ | 24. _____ |
| 4. _____ | 25. _____ |
| 5. _____ | 26. _____ |
| 6. _____ | 27. _____ |
| 7. _____ | 28. _____ |
| 8. _____ | 29. _____ |
| 9. _____ | 30. _____ |
| 10. _____ | 31. _____ |
| 11. _____ | 32. _____ |
| 12. _____ | 33. _____ |
| 13. _____ | 34. _____ |
| 14. _____ | 35. _____ |
| 15. _____ | 36. _____ |
| 16. _____ | 37. _____ |
| 17. _____ | 38. _____ |
| 18. _____ | 39. _____ |
| 19. _____ | 40. _____ |
| 20. _____ | 41. _____ |
| 21. _____ | 42. _____ |

Sentence Comprehension

Please write your answer in the appropriate space provided.

1. Ernesto drinks milk every morning for breakfast. This morning he again drank _____ for breakfast.
2. The student had to use a magnifying glass to see the insects because they were very _____.
3. When the farmer noticed the dark clouds gathering overhead, he thought to himself, "It's going to _____ very soon."
4. The band marched, and clowns rode on little bicycles in the _____.
5. George doubted that he had the strength to lift the large box of encyclopaedias and carry it to the library because the box was very _____.
6. Piggy banks, made in the shape of a pig, have slots into which you can drop _____.
7. The hiker checked her compass to make sure that she was headed in the right _____ to go south.
8. When the teacher explained the rules of the game, the students had to _____ carefully so that they would know how to play it.
9. The drawings that had once been on the old stone wall were no longer there, since the rain had _____ them away.
10. Dressed in a white hat and apron and with flour on his face, the _____ put more sugar cookies into the oven.
11. The night was very dark and still. Pablo heard only the _____ of a dog barking far away.
12. Today there was no fog covering the park. The brightly coloured flowers growing here could easily be _____ by the children as they gazed outside.
13. Because the historian wanted to preserve the documents for future researchers, she handled them with great _____.
14. The rising temperatures and extreme weather events that once seemed rare now appear to occur more _____.
15. Donating blood to the sick or injured is a noble _____.
16. Patrick was not considered a responsible person, because he was consistently _____ for appointments.
17. As is the case for many reptiles, some leatherback turtle hatchlings die soon after birth, but since a female leatherback lays 60 to 70 eggs at a time, only a few of the young need to _____ in order to maintain the species.
18. When they feel threatened, some birds pretend to be hurt so that an enemy, such as a fox, will follow them and be lured _____ from their nests.
19. Much to Margo's surprise, the sweater, whose texture was somewhat rough, did not cause her sensitive _____ to develop a rash.
20. The question has often been raised as to whether genetics or the environment plays a more important _____ in human development.

21. Forests have been destroyed to make room for people and their homes, so it is often _____ for wild animals to find enough to eat.
22. While we all share certain similarities as members of the _____ species, no two people are completely alike.
23. The northern side of the island has a few hills and valleys; otherwise, it is completely _____.
24. The cheerful, enthusiastic manner in which the scientist discussed her laboratory experiments revealed how much she _____ her chosen profession.
25. In order for one to enter an athletic event and win, both talent and determination are _____.
26. Some small dogs can run as fast as dogs with long legs, even though small dogs have legs that are _____.
27. In her science report, Mavis wrote, "Even frogs are better looking than toads, which are usually very _____."
28. When citizens go to the polls to elect a new mayor this week, they will be asked to _____ between two candidates with contrasting views of the city's future.
29. Of the four poisonous snakes that inhabit North America, the coral snake is not only the most deadly, but, with its bands of red, yellow, and black, it is also the most easily _____.
30. With the boy tugging at its string, the _____ was highly visible as its long tail dipped, swirled, and danced in the wind.
31. Most of the coach's students needed to study at least two years with her before they were qualified to skate in local and regional events; however, Diane, whose skills were less well developed than those of the typical student, required one _____ year before she was ready for such events.
32. Each street-level store space has two apartments on the floor above so that the owners can live, work, and rent out an apartment all in the same _____.
33. Although a cursory examination of the pair of sandals discovered in the archaeological dig of a long-extinct civilisation appeared well worn, a more thorough examination undertaken by archaeologists revealed them to be still sturdy, indicating that their ancient creators had _____ them extremely well.
34. Although the humpback is one of the most studied of the great whales, _____ about its social behaviour remain unanswered.
35. The organisers of two local fund-raising events realised that if they held them on the same day, they would _____ with each other for donations.
36. Animals unable to manufacture certain substances needed for their survival must _____ such substances through their food.
37. Given the extremely dilapidated condition of his car, the owner was not surprised to find out that it was _____ only a fraction of its original cost.

38. Hoping to discover what factors caused one population to contract the disease while another remained _____ of it, the biologists looked for empirical evidence of any characteristics that were unique to each population.
39. The assistant librarian, who typically treated visitors very cordially, was surprisingly _____ when the architect requested help.
40. The long hours worked by the employees, who were frequently required to put in twelve-hour shifts, sometimes adversely _____ the quality of their work.
41. It was not until Mario learned that surfing had been invented hundreds of years ago, that he realised how _____ the popular sport really is.

THE END

Thank you for your time and effort!

Appendix B
Qualitative Focus Group Interview Guide

Question	Area To Be Tapped
<ul style="list-style-type: none"> • Tell me 2 good things about being at this school • Tell me 2 bad things about being at this school 	Introductory questions
<ul style="list-style-type: none"> • Tell me about your teachers (Mathematics and English) • Do you think your teachers want you to do well? How do you know? • Do you ever feel like your teachers are putting pressure on you to do well? Why? How do you react to that? 	Relationships with teachers—pressure to achieve from teachers
<ul style="list-style-type: none"> • Tell me about how you get along with Mum and Dad • Do your parents care about how you do at school? How do you know? How do you react to that? 	Relationships with parents—pressure to achieve from parents
<ul style="list-style-type: none"> • Do you think you place pressure on yourself to do well? What makes you say that? What do you do? 	Pressure to achieve from oneself
<ul style="list-style-type: none"> • How are you going in Mathematics and English? • Are you happy with how you're going in Mathematics and English? What makes you say that? 	Mathematics and English self-concept
<ul style="list-style-type: none"> • What happens when you get a bad mark in Mathematics or English? • What do you do about it? 	Mathematics and English academic buoyancy
<ul style="list-style-type: none"> • Tell me about when you feel bad at school 	Depression

<ul style="list-style-type: none">• What are the days that you really hate coming to school? Tell me about them.	
<ul style="list-style-type: none">• Tell me about when you feel stressed out about school	Anxiety
<ul style="list-style-type: none">• What things make this school stand out from the rest?	Closing question

Appendix C

University of Western Sydney Human Research Ethics Committee Approval

From: Kay Buckley
Sent: Mon 22/09/2008 10:18 AM
To: Rhonda Craven
Subject: HREC Approval H6489

Notification of Approval

Email on behalf of the UWS Human Research Ethics Committee

Dear Rhonda

I'm writing to advise you that the Human Research Ethics Committee has agreed to approve the project, reviewed at its 15th September 2008 meeting. Please note that NEAF 5.5.1.1.8 is incorrect. The Ethics Officer should be noted as the contact person, as detailed in the Ethics Complaint clause set out in the Information sheet.

TITLE: Realised gifted students potential: elucidating psychosocial determinants and the impact of different education settings on education outcomes and psychosocial wellbeing

The Protocol Number for this project is H6489. Please ensure that this number is quoted in all relevant correspondence and on all information sheets, consent forms and other project documentation.

Please note the following:

- 1) The approval will expire on **31 March 2012**. If you require an extension of approval beyond this period, please ensure that you notify the Human Ethics Officer (humanethics@uws.edu.au) prior to this date.
- 2) Please ensure that you notify the Human Ethics Officer of any future change to the research methodology, recruitment procedure, set of participants or research team.
- 3) If anything unexpected should occur while carrying out the research, please submit an Adverse Event Form to the Human Ethics Officer. This can be found at http://www.uws.edu.au/research/ors/ethics/human_ethics
- 4) Once the project has been completed, a report on its ethical aspects must be submitted to the Human Ethics Officer. This can also be found at http://www.uws.edu.au/research/ors/ethics/human_ethics

Finally, please contact the Human Ethics Officer, Kay Buckley on (02) 4736 0883 or at k.buckley@uws.edu.au if you require any further information.

The Committee wishes you well with your research.

Yours sincerely

Dr Janette Perz Acting Chair, Human Research Ethics Committee

Appendix D

State Education Research Approval Process Confirmation



Professor Rhonda Craven
Locked Bag 1797
PENRITH SOUTH DC NSW 1797

DOC 08/71945

SERAP Number 2008219

Dear Professor Craven

I refer to your application to conduct a research project in NSW government schools entitled *Realising Gifted Students' Potential: Elucidating Psychosocial Determinants and the Impact of Different Educational Settings on Educational Outcomes and Psychosocial Well-being*. I am pleased to inform you that your application has been approved. You may now contact the Principals of the nominated schools to seek their participation.

This approval will remain valid until 22/09/2009.

The following researchers or research assistants have fulfilled the Working with Children screening requirements to interact with or observe children for the purposes of this research for the period indicated:

Name	Approval expires
Marjorie Alice Elizabeth Seaton	03/11/2009
Lucy Griezel	03/11/2009
Natasha Renee Magson	03/11/2009
Gawaian Harlech Bodkin-Andrews	03/11/2009.

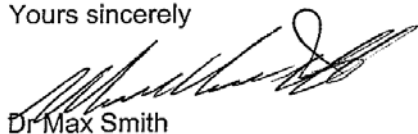
You should include a copy of this letter with the documents you send to schools.

I draw your attention to the following requirements for all researchers in NSW government schools:

- School Principals have the right to withdraw the school from the study at any time. The approval of the Principal for the specific method of gathering information for the school must also be sought.
- The privacy of the school and the students is to be protected.
- The participation of teachers and students must be voluntary and must be at the school's convenience.
- Any proposal to publish the outcomes of the study should be discussed with the Research Approvals Officer before publication proceeds.

When your study is completed please forward your report marked to the Director, Strategic Initiatives, Department of Education and Training, Locked Bag 53, Darlinghurst, NSW 2010, Ph 9244 5619.

Yours sincerely


Dr Max Smith
Acting Director, Strategic Initiatives
19 December 08

NSW Department of Education and Training
Strategic Initiatives Directorate

Level 3, No. 1 Oxford Street, DARLINGHURST NSW 2010 Locked Bag 53, DARLINGHURST NSW 2010
T 9244 5619 F 9266 8233 E serap@det.nsw.edu.au

Appendix E

School Principal Information Letter

Centre for Educational Research
University of Western Sydney
Locked Bag 1797
Penrith South DC NSW 1797



Dear School Principal,

I would like to invite your school to participate in a study being conducted by the Centre for Educational Research, University of Western Sydney entitled:

**Realising the Potential of High-ability Students:
Elucidating Psychosocial Determinants and the Impact of Different Educational
Settings on Educational Outcomes and Psychosocial Wellbeing**

The aim of this study is to ascertain how different types of schooling settings (selective high schools, comprehensive high schools that group students according to ability levels, and comprehensive high schools that do not group students) affect the academic achievement and psychological well-being of students. Also, the study aims to ascertain how parents, students, teachers, and principals consider the differing school environments impact on students in terms of academic and psychological outcomes. The purpose of this study is to directly contribute to the development of new policy and intervention programs, which will improve how students are educated in NSW.

This study is being conducted in ten Department of Education and Training schools and has been funded by the Australian Research Council. This study has been granted ethics approval from the University of Western Sydney Human Research Ethics Committee, and The Department of Education and Training has approved our request to approach you to consider your school's voluntary participation in this study.

The participation of your school would involve:

- Teachers distributing and collecting permission letters provided by the research team, seeking parental/guardian and student permission for secondary students in Years 7 to 11 to participate in the study (see Attachment 1);
- Supplying the research team with a suitable space (large enough to accommodate a year group), equipment (tables and chairs), and time to conduct the administration.
- Voluntary student participation in a year group-administered questionnaire (see Attachment 2) and standardised academic achievement test, conducted by an experienced research team over a period of up to an hour on three occasions: Term 1 Feb/March 2009 (Year 7-10); Term 3 Sept/Oct 2009 (Year 7-10); and Term 1 Feb/March 2010 (Year 8 to 11).
- Maths and English teachers' attendance at an orientation morning tea (organised by the research team) to be held at your school at a time convenient for you, where teachers will receive clear information about the study and their involvement.
- Maths and English teachers' completion of a survey about their classes and school on one occasion (Term 1 Feb/March 2009), and rating of participating students' achievement, self-concept, and effort in their specialised area on two occasions (Term 1 Feb/March 2009; and Term 1 Feb/March 2010) (see Attachment 3).

- Voluntary parental participation in filling out a short questionnaire asking about their child and your school on two occasions (Term 1 Feb/March 2009; and Term 1 Feb/March 2010) (see Attachment 4);
- The selection of two students from each year group, two parents from each year group, and two teachers participating in a one-on-one interview of about 45 minutes in Term 3 Sept/Oct 2009.
- A brief, one-on-one interview with you, which would take approximately 45 minutes in Term 3 Sept/Oct 2009.

Students will be provided with an oral and written explanation of the study before confirming their willingness to participate. We are not anticipating students will feel any distress when completing the survey, however, students will be told clearly that if they do feel at all anxious or distressed they may withdraw from the study at any time without penalty or reproach. Researchers will be on hand to answer any questions or concerns during each administration session. Furthermore, it will be ensured that students will be able to make appointments with the school counsellor if required. If students do not give consent to participate in the study, an alternative task worked out in collaboration with you will be made available.

Students will be reminded before beginning the questionnaire that their responses are anonymous. Although the student's name and school will be recorded on a covering page of the instrument (in order to match data for the identification of developmental trends across the 3 occasions of testing), this covering page will be removed and coded by the researchers to ensure confidentiality. At no stage will the identity of your school or participating students from your school be revealed in any written or verbal report originating from the study.

The participation of your school, students, parents, and teachers is voluntary. There will be no adverse consequences for those who wish not to participate and/or those who withdraw their participation after giving consent to be in the study. Only the researchers for this study will have access to the information provided. Furthermore, the data will be kept in a locked file, accessible only by the researchers in this study, although the de-identified data may be further analysed by other researchers. Your school will receive a report of key findings.

This research is being conducted by Professor Rhonda Craven (9772 6557, r.craven@uws.edu.au), Dr Marjorie Seaton (9772 6829, m.seaton@uws.edu.au), Dr Alex Yeung (9772 6325, a.yeung@uws.edu.au) Professor Herb Marsh (email address), Ladd Wheeler (number, email), and parts of this study will comprise the doctoral thesis of PhD candidate Lucy Griezel (9772 6296, l.griezel@uws.edu.au). Please do not hesitate to contact the researchers if you have any questions relating to the study.

Dr Marjorie Seaton will contact you shortly. I would like to extend my appreciation to you in your consideration of this important study, and thank you for your time.

Yours sincerely,
Professor Rhonda Craven

NOTE: This study has been approved by the University of Western Sydney Research Ethics Committee (H6489). If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Office of Research Services on telephone (02) 4736 0083, fax (02) 4736 0013, or email humanethics@uws.edu.au. Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Appendix F

School Principal Consent Form

Centre for Educational Research
University of Western Sydney

Locked Bag 1797



As part of a research study being conducted by the Centre for Educational Research, University of Western Sydney the schools' participation would involve:

- Teachers distributing and collecting permission letters provided by the research team, seeking parental/guardian and student permission for secondary students in Years 7 to 10 to participate in the study in 2009, and Years 7 to 11 to participate in the study in 2010;
- Supplying the research team with a suitable space (large enough to accommodate a year group), equipment (tables and chairs), and time to conduct the administration;
- Voluntary student participation in a year group-administered questionnaire and standardised academic achievement test, conducted by an experienced research team over a period of up to an hour and a half on four occasions: 1) Term 1, 2009; 2) Term 3, 2009; 3) Term 1, 2010; and 4) Term 3, 2010.
- Maths and English teachers' attendance at an orientation morning tea (organised by the research team) to be held at your school at a time convenient for you, where teachers will receive clear information about the study and their involvement;
- Maths and English teachers' completion of a survey about their classes and on two occasions (Term 3, 2009; and Term 3, 2010), and rating of participating students' achievement, self-concept, and effort in their specialised area on two occasions (Term 3, 2009; and Term 3, 2010);
- Voluntary parental participation in filling out a short questionnaire asking about their child and your school on two occasions (Term 3, 2009; and Term 3, 2010);
- The selection of two students, two parents, and two teachers from each year group to participate in a one-on-one interview of about 45 minutes in Term 3, 2010; and
- If selected, a one-on-one interview with me, of about 45 minutes in Term 3, 2010.

My school's participation in this study is voluntary, and there will be no adverse consequences if I wish not to participate and/or withdraw participation after giving consent to be in the study. All information provided will be unidentifiable to all other people apart from the researchers in this study. At no stage will the identity of my school or individual students be revealed in any written or verbal report originating from the study. The data will be kept in a locked file, accessible only to the researchers in this study, however the data may be further analysed by other researchers. Additionally, if I have any questions or concerns about the project, I can contact Professor Rhonda Craven (9772 6557, r.craven@uws.edu.au), Dr Marjorie Seaton (9772 6829, m.seaton@uws.edu.au), or Lucy Griezel (9772 6296, l.griezel@uws.edu.au).

I have read and understood the above and agree to participate in this study.

Principal's Name _____ (please print)

Principal's signature _____ Date _____

Appendix G

Parent/Guardian Information Letter

Centre for Educational Research
University of Western Sydney
Locked Bag 1797
Penrith South DC, NSW, 1797



Dear Parent/Guardian,

I would like to invite your child to participate in a study being conducted by the Centre for Educational Research, University of Western Sydney entitled:

Realising the Potential of Students:

Elucidating Psychosocial Determinants and the Impact of Different Educational Settings on Educational Outcomes and Psychosocial Wellbeing

The aim of this study is to ascertain how different types of schooling settings (selective high schools and comprehensive high schools) affect the academic achievement and psychological well-being of students. Also, the study aims to ascertain how parents, students, teachers, and principals consider the differing school environments impact on students in terms of academic and psychological outcomes.

This study is being conducted in eight Department of Education and Training (DET) schools and has been funded by the Australian Research Council. This study has been granted ethics approval from the University of Western Sydney Human Research Ethics Committee (H6489), and DET has approved our request to approach you to consider your voluntary participation in this study.

Your child's participation would involve:

- Your written permission to participate in the study (only students with parental permission will be able to participate in the study);
- Completing a questionnaire (measuring academic and non-academic self-concept, academic resilience, motivation, depression, anxiety, stress, personality type) and a standardised English, and mathematics achievement test, conducted within school time and on school premises by an experienced research team, over a period of up to an hour at four time points: 1) Term 1, 2009; 2) Term 3, 2009; 3) Term 1, 2010; and 4) Term 3, 2010; and
- Participation (if selected by the research team) in a one-on-one interview of about 45 minutes duration in Term 3, 2010 (only two students from each year group will be required).

Your child will be provided with an oral and written explanation of the study before confirming their willingness to participate. We are not anticipating your child will feel any distress when completing the survey, however, he/she will be told clearly that if they do feel at all distressed they may withdraw from the study at any time without penalty or reproach. Researchers will be on hand to answer any questions or concerns during each administration session. Furthermore, it will be ensured that your child is able to make an appointment with the school counsellor if required. If you or your child do not give consent to participate in the study, an alternative task worked out in collaboration with the Principal will be made available.

Your child will be reminded before beginning the questionnaire that their responses are confidential. Although their name and school will be recorded on a covering page of the survey (in order to match data to identify developmental trends across time), this page will be removed and coded by the researchers to ensure confidentiality. At no stage will the identity of your child or their school be revealed in any written or verbal report originating from the study. Your child's participation is voluntary. There will be no adverse consequences to your child if they do not wish to participate and/or withdraw their participation after giving consent to be in the study. Only the researchers for this study will have access to the information provided. Furthermore, the data will be kept in a locked file, accessible only by the researchers in this study, although the de-identified data may be further analysed by other researchers. The school will receive a report of key findings pertaining to the school specifically, and the study in general.

This research is being conducted by Professor Rhonda Craven (9772 6557, r.craven@uws.edu.au), Dr Marjorie Seaton (9772 6829, m.seaton@uws.edu.au), Dr Alex Yeung (9772 6325, a.yeung@uws.edu.au) Professor Herb Marsh (herb.marsh@education.ox.ac.uk), Professor Ladd Wheeler (l.wheeler@psy.mq.edu.au), and parts of this study will comprise the doctoral thesis of PhD candidate Lucy Griezel (9772 6296, l.griezel@uws.edu.au). Please do not hesitate to contact the researchers if you have any questions relating to the study.

Yours sincerely,
Professor Rhonda Craven

NOTE: This study has been approved by the University of Western Sydney Research Ethics Committee (H6489). If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Office of Research Services on telephone (02) 4736 0083, fax (02) 4736 0013, or email humanethics@uws.edu.au. Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Appendix H

Parent/Guardian Consent Form

Centre for Educational Research
University of Western Sydney
Locked Bag 1797
Penrith South DC, NSW, 1797



As part of a research study being conducted by the Centre for Educational Research, University of Western Sydney my child has been asked to participate. I give permission for:

- My child to complete a questionnaire (measuring academic and non-academic self-concept, academic resilience, motivation, depression, anxiety, stress, personality type) and a standardised English and mathematics achievement test, conducted within school time and on school premises by an experienced research team, over a period of up to an hour at four time points: 1) Term 1, 2009; 2) Term 3, 2009; 3) Term 1, 2010; and 4) Term 3, 2010; and
- My child (if selected by the research team) to participate in a one-on-one interview of about 45 minutes duration in Term 3, 2010.

My child's participation in this study is voluntary, and there will be no adverse consequences to my child if he/she does not wish not to participate and/or withdraw participation after giving consent to be in the study. The information he/she provides in the survey will be unidentifiable to all other people apart from the researchers in this study. My child's responses are confidential. All identifying information will be removed and coded by the researchers to ensure confidentiality. Only the researchers for this study will have access to the information provided. Furthermore, the data will be kept in a locked file, accessible only by the researchers in this study, although the de-identified data may be further analysed by other researchers. The school will receive a report of key findings pertaining to the school specifically, and the study in general.

Additionally, if I have any questions or concerns about the project, I can contact Professor Rhonda Craven (9772 6557, r.craven@uws.edu.au), Dr Marjorie Seaton (9772 6829, m.seaton@uws.edu.au), or Lucy Griezel (9772 6296, l.griezel@uws.edu.au). Alternatively, I can speak to the principal.

I have read and understood the above and agree for my child to participate in this study.

Student's Name _____ (please print)

Parent/Guardian's Name _____

Parent/Guardian's Signature _____ Date _____

Please have your child return this form to their roll call teacher.