



MINISTRY OF EDUCATION

Te Tāhuhu o te Mātauranga

Academic performance of first-year bachelors students at university

This report forms part of a series called Secondary to tertiary transitions.

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SUMMARY

KEY POINTS

The study considered a population of first-year bachelors-degree students at university, who had all achieved the National Certificate of Educational Achievement (NCEA) level 3 and attained the University Entrance standard.

While academic achievement at school was the strongest predictor of first-year university performance for these students, not all higher-achieving school students performed equally well at university, and some who had lower school achievement out-performed students with higher school achievement.

Among higher-achieving school students, those who:

- studied part-time or for only part of the year, or
- were from the sole-Pasifika¹ ethnic group, or
- were low-decile school students from ethnic groups other than sole-European

showed lower levels of university performance than other higher-achieving school students.

Among those with lower school achievement, students who took a year off before starting their tertiary studies—particularly students from low-decile schools—showed higher levels of performance at university than those who progressed directly to tertiary study after leaving school.

But this better performance among those who took a gap year was not seen in European, or sole-Pasifika students.

Lower-achieving students from low-decile schools performed better in their first-year of tertiary studies than similar students from high-decile schools. This suggests that among lower achieving students, NCEA underestimates the ability of those from lower decile schools. And conversely, NCEA overestimates the ability of those from higher decile schools.

This analysis looks at intramural, first-year bachelors-degree students at university. It analyses which factors were linked to successful performance at university. The factors studied were: the last school they attended, the field of study at university, demographic factors, whether the student took a gap year² and the level of school achievement. Each student in the study population had gained the National Certificate of Educational Achievement level 3 and achieved the University Entrance standard. The indicator of performance at university is whether the student passed 75 per cent or more of their first-year courses.

School achievement was found to be the most important factor associated with students' academic performance in their tertiary studies. Students with below-average school achievement were less likely to pass most of their first-year tertiary courses, with likelihoods ranging from

¹ Ethnicity is reported in this study using never-, ever- and sole-ethnic categories. The sole-Pasifika category, for example, represents those students who indicated Pasifika as their ethnic group while at school, and also while in their tertiary studies, and did not indicate any other ethnic group identification during this period. A more detailed description of the ethnic group categories can be found in the body of the report.

² A gap year means the student didn't progress to university in the year after leaving school but progressed a year later.

about 0.3 to 0.8. For above-average students at school, the likelihood of passing most first-year courses ranged from 0.8 to near certainty.

For most students who showed above-average academic success at school, their gender, ethnicity, what school they attended, what qualification they enrolled in, or whether they progressed directly to tertiary study or took a year off after leaving school, made almost no difference to their tertiary performance.

However, there were some exceptions. Students with above-average school achievement from ethnic groups other than the sole-European group, who attended low-decile schools, were less likely to pass most of their first-year courses compared to similar students from other schools. Sole-Pasifika students showed the greatest difference. Similar sole-European students who had attended low-decile schools did not show this affect.

For students with below-average school achievement, the qualification they enrolled in made a substantial difference to their likelihood of them passing most of their courses. Students enrolled in creative arts and teacher education qualifications were more likely to pass their courses when compared with students enrolled in engineering, natural and physical sciences, society and culture, and management and commerce qualifications. The likelihood of passing most first-year courses for students in health qualifications fell between these two groups. Above-average school students were far more likely to pass most of their courses, with few or no differences between students enrolled in different fields of study.

Below-average students who took a year off before starting their tertiary studies improved their chances of passing most of their first-year courses. If these students were from low-decile schools, the improvement was substantial, but for similar students from high-decile schools, the improvement was far smaller. Taking a gap year did not significantly improve university achievement for European students with lower school achievement, or for sole-Pasifika students, from either low or high-decile schools.

The improvement in university performance for students who took a gap year probably derives from the fact that only motivated or confident students enrol in tertiary studies after taking a break. Those students who are not motivated, or lack confidence in their ability, do not continue with their studies.

Among those with below average school achievement, the decile of the school attended affects university achievement. For sole-European students (who comprise the majority of students in the study population) those with below-average school achievement from low-decile schools out-performed similar students from high-decile schools. A similar result has been observed in Australia and the UK. This suggests that school achievement scores may over-estimate the ability of some students—those with lower ability—who attended high-decile schools. This means that when school achievement is controlled for, the students from high-decile schools perform at relatively lower levels than similar students from low-decile schools. Conversely, school achievement scores may understate the ability of below-average students who go to low-decile schools.

Part-time or part-year students were less likely to pass most of their first-year courses than students who studied full-time for the full-year, although at the extreme ends of the school achievement score range, there was little or no difference between students with different study loads.

There were essentially no differences in tertiary performance between male and female students when controlling for ethnic group.

1 INTRODUCTION

The funding of tertiary education in New Zealand has, since 1998, been broadly based on student numbers: the more students a tertiary institution enrolled, the more funding it received. There are other sources of funding, tied to research excellence (for universities) and other criteria, but the bulk of the funding is based on student numbers. In 2008, in response to rising student numbers, the government imposed caps on how many students an institution could enrol. This was done to place limits on the overall level of tertiary funding, and provide certainty to the tertiary education budget. At that time, student numbers at most institutions were below their maximum limits.

In 2009, the New Zealand government foreshadowed further changes to tertiary funding. Specifically, from 2012, some funding will be tied to successful student outcomes, including the proportion of students progressing to higher levels of study, and subsequent course and qualification completions (Tertiary Education Commission 2009). This change in the funding criteria will invariably focus institutions' attention on their students' performance.

The recent global recession saw demand for tertiary education increase substantially (Smart 2009, Ministry of Education 2009). In 2009, many institutions reached, and some exceeded, their student enrolment caps. In addition to not being funded for students above the caps, the problem for the institutions is that many students will not pass their courses or complete their qualifications, placing the funding linked to student outcomes at risk. The intention of linking funding with student outcomes is to encourage institutions to support learning as a way of improving the course and qualification completion rates.

In addition to providing learning support, some institutions may limit enrolments of potentially poor performing students. There have been calls by the New Zealand Vice-Chancellors' Committee to review university entrance standards (University World News 2009), and individual university vice-chancellors have been reported as saying that tougher enrolment criteria are needed, to increase the enrolments of students who are motivated, or those who are likely to succeed (The Press 2010)³. The difficulty is in predicting *which* students are the more motivated and the ones more likely to succeed.

The literature shows that the best predictor of tertiary performance is a student's academic success at school. However, as this report will show, school achievement is not always a reliable predictor of tertiary performance. While using academic success at school as an indicator of tertiary performance will, in the main, select potentially higher achieving students, it will discriminate against some minority groups, and potentially deprive the universities of some of their better-performing students.

It is important then to consider what factors influence students' performance in tertiary education. Previous New Zealand studies have considered this question, focussing on qualification completions (Scott 2004, Scott and Smart 2005, Scott 2009a) and course completions for Māori students (Earle 2007, 2008), school students (Scott 2008), and students generally (Scott 2006, 2009a). There is also an extensive body of international research considering this question.

This present study builds on the earlier New Zealand studies, using extra years of data, and includes a method of reporting ethnicity little used in educational research. It follows an earlier study (Engler 2010) which considered the factors affecting the progression from school to bachelors-level study. This present report considers this same cohort of students, and explores

³ The New Zealand Qualifications Authority has recently initiated a review of the University Entrance (UE) standard.

the factors affecting the academic success of school leavers in their first year of bachelors-level study at university.

The people in the study population were those intramural students, born between 1985 and 1991, who were in their first year of bachelors-degree study at university over the period 2006 to 2008. The students had all attained the National Certificate of Educational Achievement (NCEA) level 3 *and* achieved the UE standard, and were studying for their degrees for the first time. By restricting the focus to students with both level 3 and UE meant that the results were not confounded by students who did not do well at school, but nevertheless, after turning 20 years of age, were eligible to enter university through ‘special admission’, without the pre-requisite school achievement.

The measure of university performance used in this study is the proportion of students who passed most (more than 75 per cent) of their courses in their first year of study. This measure has been used in other studies (Earle 2007, 2008). The results are similar if the criterion used was for a student to have passed 100 per cent of their first year courses. Measuring qualification completion is also desirable. However, the current data does not provide sufficient years of study to do this. First-year course completion provides a good proxy for eventual degree completion.

The previous study by Engler (2010) using this study population found significant differences in the likelihood of undertaking bachelors-level study for students from different backgrounds. In particular, a higher likelihood of progressing to bachelors-level study was associated with higher school achievement, but this was not the case for sole-Pasifika students, or Māori students generally from low-decile schools. The particular focus of this current research was to see if these factors continued to have an influence on educational outcomes, once the decision to start tertiary study had been made. While not every student wants, or is able, to complete their first year at university, if a particular group is disproportionately failing to complete, this is cause for concern.

2 PREVIOUS STUDIES

There is a rich literature on the factors that influence a students' performance in their first year of study. Useful summaries and reviews are given in Evans (1999), Birch and Miller (2004) and Scott and Smart (2005).

The factor that is most correlated with first year tertiary students' performance is their previous academic performance in school⁴. Students who perform well in secondary school, or even primary school, do well at university (Birch and Miller 2004).

The qualification a student enrolls in also plays a role. In New Zealand, students who study qualifications in the fields of health or education have the greatest likelihood of completing their degree. Students in the fields of natural and physical sciences and information technology, and society and culture have the lowest rates of completion (Scott and Smart 2005). For bachelors courses⁵, Scott (2006) found natural and physical sciences had the lowest course pass rate (78 per cent) with health the highest (89 per cent). Other studies have shown links between students' domain-specific knowledge and their motivation to study a subject, which also relates to their course preference and academic preparedness (Evans 1999). The link is strongest for science disciplines (Evans 1999).

The gender of the student is also important. Overall, females generally perform better than males, but there are exceptions in some disciplines (Evans 1999).

Ethnic group is also sometimes associated with academic achievement (Evans 1999). The few Australian studies that have examined the impact of ethnic background on grades have indicated only a small impact on academic performance (Birch and Miller 2004). Australian students from non-English speaking backgrounds have been found to have slightly higher grades than students from English speaking backgrounds. This was attributed to there being a greater motivation to study at university due to cultural factors that place a premium on education (Birch and Miller 2004). Scott & Smart (2005) showed that in New Zealand, Māori and Pasifika had the lowest degree-completion rates, even after adjusting for various demographic and study-related factors.

Some studies have found that gaining entry to tertiary studies and students' persistence and success in tertiary study, are related to socio-economic status (Evans 1999). However, Birch and Miller (2007) in another Australian study, found that students from middle-level socio-economic communities performed better than lower socio-economic students of the same ability level, who in turn performed slightly better than higher socio-economic students, again, of the same ability level. They suggested this was because higher socio-economic families disproportionately send their children to non-government schools. Studies have shown that non-government school students in Australia do not perform as well at university as government school students when school achievement is controlled for (Birch and Miller 2004).

The age of a student has also been found to be important. Younger students are more likely to complete qualifications than older students in actual terms, but older students generally outperform their younger counterparts when controlling for full-time and part-time study status (Scott and Smart 2005). Age, though, is correlated with taking a gap-year. That is, a student

⁴ There are two other factors that have a large impact on tertiary success; the level of study (certificate, diploma, bachelors, post-graduate) and study load. This study only focuses on bachelors-level students, who in the main, study full time.

⁵ In New Zealand, a course refers to a distinct module, paper, or unit of study that forms part of a larger programme of study that may or may not lead towards a recognised qualification. This differs from other countries, such as Australia or Britain, where the term 'course' is commonly used to refer to the whole qualification.

who takes some time off before starting tertiary study will generally be older in their first year of study than a student who progresses directly to tertiary study after leaving school. Students who take a gap-year out-perform students who progress directly (Birch and Miller 2007). The age of a student is also correlated with maturity and motivation, which has been shown to be a good predictor of academic performance (Evans 1999).

There are also a number of psychological characteristics that affect students' tertiary performance.

Academic preparedness, learning strategies, goal commitment and academic motivation have all been shown to be important (Evans 1999). Self-efficacy is particularly important (Chemers et al 2001). Self-efficacy is described as the particular actions a person chooses to pursue, the amount of effort expended, the perseverance shown in the face of challenges and failures, resilience, and the ability to cope with the demands associated with the chosen course of action. Students with confidence in their ability to perform well academically perform significantly better than less confident students. Likewise, students who have higher expectations for academic success show higher performance (Chemers et al 2001). Recent New Zealand research has questioned the general validity of this. Otunuku and Brown (2007) found that in spite of high expectations, positive attitudes and high self-efficacy, Pasifika students have low academic performance. They questioned the validity of the applicability of self-efficacy and preference attitudes to predict academic performance for low socio-economic immigrant students from 'agrarian or traditional' societies.

Academic preparedness for tertiary education was also highlighted by Madjar et al (2010) for New Zealand students in their first year at university. In their study, students who had the cultural capital and the competencies and skills to interact with the university environment had fewer problems with academic engagement. Such skills included ways of speaking, subject specific vocabularies, prior exposure to relevant ideas, knowing how to participate in discussions, and how to seek help. It was not that the students with these skills did not need help to adjust to university life, but that they knew how to obtain this help in the course of normal classroom activities. They did not have to access learning support services, which some students saw as an admission of failure, which in turn affected their motivation, and academic performance.

Family and peer support, study mode and financial hardship have all been shown to have an effect on study performance, although some studies have shown no difference between full-time and part-time students. In addition, attending the institution of their choice, and studying subjects that interest them, also improves students' performance (Evans 1999).

Some studies suggest that there are factors that affect academic performance that are specific to minority ethnic groups, and relate to the interaction between the student and the institution. Among those factors are isolation, alienation and lack of support (Allen 1992), and perceptions of prejudice and discrimination (Nora and Cabrera 1996). Although these studies refer in the main to American students, institutional factors may also be playing a part in the New Zealand context. A study of New Zealand school students (Tuuta et al 2004) found that teachers' low expectations of Māori students contributed to Māori students' lack of success. Tuuta et al reported that it was a lack of professional knowledge regarding effective pedagogy for minority ethnic group students. It is possible that similar patterns of behaviour may be occurring in tertiary providers.

This present study looks at a number of the factors explored in the literature summarised above. Achievement at school, ethnic group (including within ethnic group distinctions), and the tertiary subject studied are included. The socio-economic rating of the last secondary school attended is included – this is a proxy for the socio-economic standing of the student's

community and for a number of school-based factors. The timing of the progression to tertiary study — whether the student went directly after leaving school, or took a year off — is also included. Gender, whether the student studied intra- or extramurally, and whether the student studied full-time or part-time, are considered, and controlled for. Age is not considered separately because this study is restricted to a narrow age range, and within that range, age is correlated with the timing of progression.

3 THE DATA AND STUDY POPULATION

Two sources of data were used. School achievement data was provided by the New Zealand Qualifications Authority. This data is linked, via the national student number⁶, to tertiary enrolment data supplied by tertiary education providers to the Ministry of Education. The study population was confined to first year intramural domestic students studying for a bachelors degree at a university. In addition, students were selected if they had gained NCEA level 3 and UE. Students varied between 17 and 20 years of age, and were studying in the years 2006 to 2008. There were 31,706 students in the study population.

The requirement for students in the study population to have UE derives from the fact that the UE standard is not required for entrance to university for older students. Those 20 years and over can be granted special admission to a university, without the usual prerequisites. Since previous academic success is such an important determinant of performance at tertiary level, it was important to ensure that *all* students could have gained entry to university based on their school qualifications, rather than by special admission. The alternatives—only including students less than 20 years of age—would have limited the number of students enrolling after a gap year.

Scott and Smart (2005) found that extramural students had significantly lower rates of qualification completion, even when controlling for other variables. This is confirmed for students in the present study, where 54 per cent of extramural students passed most of their courses, compared to 76 per cent for intramural students. Extramural students also make up less than 1 per cent of students in the data available for this study. For these reasons extramural students are excluded from the study population.

By limiting the study to first-time *first-year* students, vagaries arising from external factors that influence success at university study are reduced, and a stronger link is maintained between success at school and performance at university. It does not however, provide an indication of the overall success in gaining a qualification, which is arguably the ultimate success factor for this group. In spite of this, first year course pass rates are an important guide to later results (Birch and Miller 2006). At least for younger students, passing most or all of the courses in first year is correlated with continuing to study, and a pre-requisite to gaining the overall qualification. Older students are more likely to be studying part-time, which decreases qualification completion rates.

The data was analysed combining tertiary enrolments for the years 2006 to 2008, as there were no significant differences between these years. Data was available for 2005, but there were significant differences between this year and the others, with 2005 showing generally lower levels of academic performance, especially for students with lower school achievement. That year, 2005, was the first that students who had completed all three years of NCEA study began tertiary education, and the lower academic performance may have been due to this. Certainly, the proportion of students in 2005 who gained UE was significantly lower than the other years in this study; 11 per cent of the 2005 cohort had gained UE, compared to an average for the other three years of 26 per cent. This supports anecdotal evidence which suggests that this first cohort of students was not as aware of the requirements under NCEA that would enable them to enter university. To avoid distortions, students studying at university in 2005 were omitted from the study population.

⁶ More information on the national student number can be found at <http://www.minedu.govt.nz/NZEducation/EducationPolicies/Schools/SchoolOperations/NationalStudentNumber/InformationForParentsAndStudents/FrequentlyAskedQuestions.aspx>.

4 THE STUDY VARIABLES

This section considers the various factors used in this study. It discusses the nature and general characteristics of the factor in the study population, and any caveats or considerations in their interpretation.

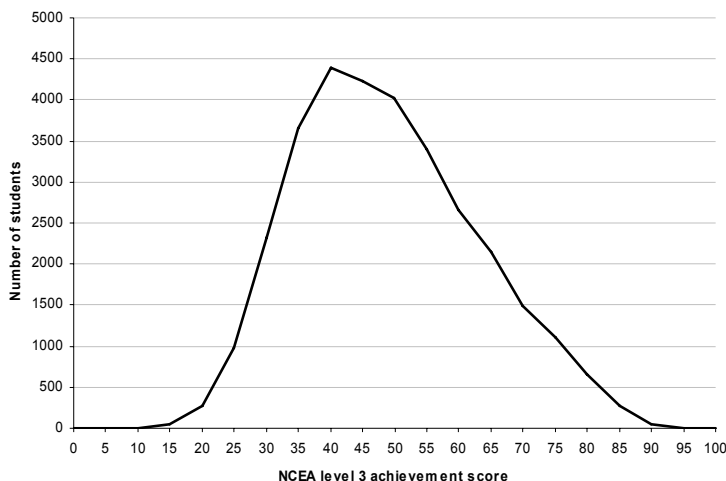
4.1 Academic achievement at school

Academic achievement at school is measured with the NCEA level 3 achievement score. The achievement score variable has been used in other studies (Ussher 2008, Scott 2008, Earle 2008, Engler 2010). This measure of student achievement was developed for analysing NCEA results by Michael Johnston at the New Zealand Qualifications Authority (NZQA). Readers are referred to Ussher (2008) for a more detailed description of this variable.

The achievement score rates students' grades in their NCEA level 3 qualification against other students in the same year, producing a score between 0 and 100. Students who gained level 3 credits with excellence and merit grades will score higher than students who gained credits with relatively fewer merits or excellences, or with relatively more achieved grades. The score also adjusts for the level of difficulty within a standard. A student, who achieved an excellence in a standard where many people gained a merit or excellence, will receive a lower score for that standard, while a higher score is given to a similar student in a standard where most people received an achieved grade, for example.

For the whole study population, the mean achievement score was 51.7 (median 50.4), and ranged between 5 and 95. Most students had achievement scores between 20 and 90. Figure 1 shows the distribution of students across the range of achievement scores. It can be seen that the distribution is skewed slightly towards higher achievement scores, a result expected given this is a population of students who elected, and were selected, to study at bachelors level at university.

Figure 1
Distribution of students by NCEA level 3 achievement score



Recent research in New Zealand has shown that student motivation is strongly correlated with achievement in the NCEA system (Meyer et al 2009). Students who indicated in Meyer's study that they were *Doing their best* were significantly correlated with the attainment of more credits,

more internally passed standards with excellence, and externally assessed standards at all levels. Students who indicated *Doing just enough* were associated with lower achievement and significantly associated with higher total unit standard credits⁷. Since the relative number of unit standards and achievement standards, and how well a student performs in the latter are used to calculate the achievement score, it follows that the achievement score is correlated with motivation as well as ability.

Bowen et al (2009) concur. They argue that high school grades reveal more than mastery of content. They also reveal qualities of motivation and perseverance — as well as the presence of good study habits and time management skills — that say a great deal about the chances that a student will complete a tertiary programme. This is independent of the high school attended, since they found, as this study finds, that students' high school grades predict tertiary outcomes regardless of whether the school had high academic standards or not. In the present study, given that the study population already met a minimum academic standard (NCEA level 3 and UE), it is not surprising that achievement score correlates so highly with passing first-year courses.

In 2007, the NCEA reporting system was changed to include endorsements on certificates of student achievement. Previously, a certificate only showed that a student had gained a particular NCEA level. With the change, the certificate also indicated whether the student achieved the NCEA level with merit or excellence. This had the effect of generally increasing student motivation (Meyer et al 2009); only about 10 per cent of students indicated the change did not matter to them. In the present study, this change to a student's motivation would have affected students in the 2008 tertiary cohort (primarily those who left school in 2007). However, when the study population was tested, no significant difference between years was found. This may be due to the fact that the change to the NCEA reporting method was announced in mid-2007, so would have had a minimal affect on the motivation of the 2007 school-year students. Meyer et al (2009) found that only 53 per cent of students in 2007 knew about the planned changes. Whether this change has an impact on later cohorts of students needs to be tested in future.

4.2 Ethnic group

The four main New Zealand ethnic groups are considered; Asian, European, Māori and Pasifika. Ethnic groups are reported using the categories never-, ever- and sole-ethnicity.

In summary, the ethnic categories are based on the recorded ethnic identifications across the multiple data sources used in the study. If a student is only ever identified as Māori—across all years and across all data collections—they are counted in the sole-Māori category, and also in the never-European, never-Pasifika, and never-Asian categories. If a student is sometimes identified as Pasifika, and at other times as Pasifika together with another ethnicity, or as another ethnicity entirely, they are counted in the ever-Pasifika category, as well as in the other categories that apply. And if a student is never identified as European, either alone, or in combination with another ethnicity, they are counted in the never-European category, and in the other appropriate ethnic categories. For each student there are four ethnic variables, one for each of the main ethnic groups, and each variable holds one of three states (never-, ever- and sole-). For a complete description of these categories, and the reasons why they are used, see Engler (2010).

It should be noted that the never-, ever- and sole- descriptions are based on a six-year period from which the study population was drawn, not just the three years the study population were enrolled in tertiary education. The ethnic identification of a student might change again in the

⁷ Details about the National Certificate of Education Achievement can be found at <http://www.nzqa.govt.nz/ncea/about/index.html>. This site also has details about University Entrance.

future. However, a six-year period provides a better indication of ethnic identification than a single snapshot in time.

Table 1 shows the sample sizes of the ethnic groups and their within-ethnic-group categories. It can be seen that sole-Māori and sole-Pasifika, as a proportion of the individual ethnic groups, are far less represented than either sole-European or sole-Asian groups. Comparing this table with table 2 in Engler (2010), which shows the same data for school leavers, it can be seen that the European and Asian sole-ethnic categories are virtually unchanged, while sole-Māori has dropped from 33 per cent to 21 per cent, and for Pasifika, 48 per cent to 38 per cent. This indicates significant shifts in the composition of these ethnic groups in the transition from school to tertiary study. This suggests that the students in these two sole-ethnic groups are more likely to have lower school achievement scores, or have attended low-decile schools, or both, which are associated with lower likelihoods of students electing to progress onto bachelors-level study (Engler 2010).

Table 1
Summary of sample sizes for each ethnic group category by ethnic group

Ethnic group category	European	Asian	Māori	Pasifika
Never in this group	6,405	26,067	28,849	30,245
Ever in this group	3,549	1,170	2,255	900
Solely (only ever) in this group	21,752	4,469	602	561
Sole category as percentage of total ethnic group	86%	79%	21%	38%

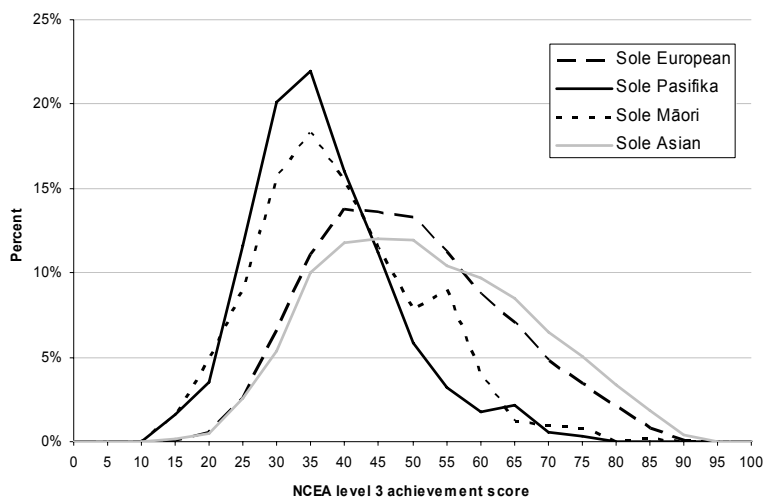
It should be pointed out that the never-, ever- and sole-ethnic method of reporting ethnicity is not a measure of, or a proxy for, the strength of a person's cultural or ethnic affiliation. These categories simply represent the history of an individual student's declarations on data capture forms over a period of time, and do not reflect the range of reasons a student might choose one or more particular categories. For example, a person who is regarded as ever-Pasifika may have ties to their culture as strong as, or stronger than, a person regarded as sole-Pasifika, and similarly for people in the other ethnic groups. The measure of ethnicity in this study, as in most administrative data, represents the *identification* of a person's ethnicity⁸. It is what a person has said they are, when asked to indicate their ethnicity on a form or in a census. This is distinct from the *identity* of a person, which is the ethnicity they think they are. Two further facets of identity can be defined: *attachment*, which indicates to what extent a person can speak the language, knows the customs, and participates in their ethnic group's cultural activities, for example, and *orientation*, which is a person's ethnic identity in a given situation or context (this applies mostly to those people with multiple ethnic identifications). While these other facets of identity may (or may not) have an influence on educational and other outcomes, they were not able to be measured in this study.

This method of reporting ethnicity results in some students belonging to more than one ethnic-group category. Comparisons between ethnic groups must take this into account, although this does not affect within ethnic group comparisons. Specifically, a student will be counted in two (or, more rarely, three) of the ever-ethnic categories if the data shows they identified with two (or three) of the ethnic groups. Students in the sole-ethnic categories, by definition, can belong to one and only one of these categories. Students in the never-ethnic category for one ethnic group will belong to either the ever- or sole-ethnic group category of another ethnic group.

⁸ These facets of identity were described by Tahu Kukutai in a paper presented at the University of Otago's School of Medicine and Health Sciences seminar series, 21 August 2009 titled, "Exploring ethnicity: Concepts, tools and 'evidence'". They are used here with permission.

Figure 2 shows the distribution of students by achievement score and sole-ethnic group in the study population. It can be seen that the distributions differ slightly by ethnic group, although generally there is much overlap.

Figure 2
Distribution of students for NCEA level 3 achievement score and ethnic group



The study uses the ethnic groups at a relatively high level, combining the various sub-groups below this level of reporting. The Pasifika ethnic group contains students from the individual Pasifika nations; Tonga, Niue, Fiji and others. However, the small numbers of students in most of these individual nations preclude their being analysed separately. The same applies to the other ethnic groups; iwi are not separately analysed for the Māori ethnic group, nor are the individual countries that make up the European and Asian groups.

Analytically, this may not be a problem for Pasifika students. Madjar et al (2010) found that Pasifika students, whether New Zealand or overseas born, or of mixed or single ethnic heritage, had stronger connections to a generic Pasifika identity, and not to an individual Pacific Island nation. Madjar et al stated that the Pasifika participants in their study had a strong sense of Pacific Island identity, both in how they referred to themselves, and in how they perceived they were seen by others.

4.3 Timing of progression to tertiary study

The effect of students taking time off between leaving school and starting tertiary study has been little studied, although it is reported that the taking of a gap-year has been increasing in popularity in Australia (Birch and Miller 2007). In the population of the present study, between 7 and 8 per cent of students took a gap year in the years 2006 to 2008. This compares to 6 per cent for students at the University of Western Australia in the years 2002 to 2004 (Birch and Miller 2007), and 8 per cent in the UK in 2002 (quoted in Birch and Miller 2007). Holmlund et al (2008) report that among Swedish university entrants around the turn of the century, some 25 per cent had taken 2 to 4 gap years, and around 40 per cent had more than five years gap.

Previous studies on the effects of a gap year have produced conflicting results (Birch and Miller 2007). Some studies demonstrate that students benefit from a gap year, while others report that a gap year adversely affects academic outcomes and later labour market outcomes. Adelman (2006) advocates no delay in attending college in the US, with length of delay increasing their chances of not completing a degree. He notes however, that once a student begins tertiary study,

their actual tertiary academic performance is more important in determining whether they gain a degree than whether they progressed directly to tertiary education after leaving school, or took some time off. Also in the US, Horn et al (2005) show that, compared to students who progressed directly, the likelihood of completing a post-secondary qualification, or still being enrolled after six years, was significantly lower only for students who delayed for no more than one year. The results for students who delayed for longer periods of time were not statistically different from the directly progressing students. The short duration of the data in the present study limits the analysis of gap-year students to those who only take a one-year gap. Future studies will determine the effect of a longer break between school and tertiary study in New Zealand.

Holmlund et al (2008) suggest that taking a gap year in Sweden is motivated by the desire to wait for better educational opportunities, and this is largely irrelevant for top performing students, where the stronger school credentials imply generally higher chances of being accepted in any university course.

Bornholt et al (2004) showed that students deferred their entry to an Australian university because of low confidence in their abilities and interest, the need for living expenses, the attitudes of parents, teachers and friends, and hesitancy about their course choice⁹. This suggests that those students who can overcome some of these concerns, or regain their interest, may go on to study at university.

The likelihood of taking a gap year varies. Birch and Miller (2007) found in Australia that taking a gap-year is positively correlated with being female, living outside a capital city, being born in an English-speaking country and speaking English at home. They also found a negative relationship between the probability of deferring university and students' score on the university entrance examinations. They found no significant relationship with the socio-economic status of the student.

In the population of students in the present study, taking a gap-year was positively correlated with being sole-European. Being female was not significantly associated with taking a gap-year. A high achievement score (>75) was negatively associated with taking a gap-year, as was coming from a low-decile school. Pasifika and Asian students were less likely to take a gap year. Having taken a gap year, students were less likely to study full-time full-year.

In the present study it was not possible to determine what motivated a student to take a gap year, and what they did in their gap year. These are areas for future qualitative studies, particularly given the positive impact that taking a gap year has on first-year tertiary performance.

4.4 School decile

Few (3 per cent) of the students in the study population had attended a decile 1 or 2 school, with 44 per cent having attended a decile 9 or 10 school.

This difference reflects the proportion of students eligible, and wanting, to study at bachelors level. The previous study on this population of students (Engler 2010) showed that students from low-decile schools were significantly less likely to go on to study at bachelors level, in spite of having the credentials to do so. There are also fewer low-decile school students with the credentials to study at university. Using the cohort of students who left school between 2004 and 2007, who gained NCEA level 3 and progressed directly to tertiary study, 82 per cent of

⁹ Bornholt et al (2004) considered students who had made an application to study at a university, but then deferred their enrolment once they were accepted. In the present study, it is not possible to distinguish between this type of deferment and one where a student takes a gap year *before* making an application to study at a university.

students from low-decile schools had gained UE, compared to 95 per cent from higher decile schools.

Table 2 shows the distribution of bachelors-degree students studying at university by achievement score bands and school decile categories. The data shows the disproportionate representation of students from high-decile schools. It also clearly shows that students from low-decile schools have on average lower achievement scores than their peers from other schools.

Table 2
Distribution of students across achievement score and school decile categories

School decile	NCEA level 3 achievement score				Total	Number of students
	0-24	25-49	50-74	75-100		
1-2	7%	69%	23%	1%	100%	1,075
3-8	1%	53%	41%	5%	100%	16,545
9-10	<1%	43%	48%	9%	100%	14,086
Total	1%	49%	43%	7%	100%	31,706

School decile is a limited but useful explanatory variable in education research. Many analyses show school decile having a significant association with educational outcomes. That it is important is quite clear; what is not as clear is what the variable actually measures.

A school's decile indicates the extent to which the school draws its students from low socio-economic communities, which is based on household income, parental occupation, receipt of benefits and parental education. Decile 1 schools are the 10 per cent of schools with the highest proportion of students from low socio-economic communities, whereas decile 10 schools are the 10 per cent of schools with the lowest proportion of these students. Deciles are used to provide funding to state and state integrated schools to enable them to overcome the barriers to learning faced by students from low socio-economic communities. The lower the school's decile, the more funding they receive¹⁰. In education research, the school decile is often used as a proxy for socio-economic status in the absence of any better measure. Since the school decile is a property of the school (or the community or catchment from which the school draws its pupils), when analysing individual student data, each student from a school is given the decile rating of that school. This is problematic because all secondary schools draw students from a wide range of socio-economic groups, so that any individual student may come from a different socio-economic group. This problem is usually accepted by researchers, given how important school decile is as a predictor variable, and conclusions reached by these studies often give caveats about the interpretation of the results. The error this introduces is less severe if the focus is on differences between low- and high-decile schools, that is, comparing decile 1 and 2 schools with decile 9 and 10 schools.

However, school decile is also likely to be a proxy for a number of school characteristics which are important in determining academic success. The quality and number of resources the school has available for its students may be correlated with the decile rating, as may factors associated with teaching, and teacher and parental expectations. This is not to suggest that only good teachers are to be found in higher decile schools, or that parents from all backgrounds do not have high aspirations for their children to succeed. But there are a number of factors that affect

¹⁰ Quoted from Ministry of Education website, <http://www.minedu.govt.nz/NZEducation/EducationPolicies/Schools/SchoolOperations/Resourcing/OperationalFunding/Deciles/FrequentlyAskedQuestionsAboutDeciles.aspx>

educational achievement that run parallel with the school decile rating. These are summarised for New Zealand schools by Ladd and Fiske (2001):

- Schools with high concentrations of disadvantaged children are forced to spend more time and effort establishing basic student routines, and devote more attention to pastoral and disciplinary activities, meaning less time is available for higher learning.
- High decile schools are often able to attract more capable teachers. Teachers with a given amount of experience receive the same basic pay regardless of where they teach. Some teachers find teaching in a high decile school more satisfying because they think the students are more motivated and ready to learn.
- High decile schools have better resources. Schools receive most of their funding from the government, but are permitted to raise additional funds from parents in the form of donations and other sources. Higher decile schools typically raise more local funds from parents and other sources than do lower decile schools. This does not offset the greater funding lower decile schools receive from government, but they represent only part of the contribution parents make. The greater the parents' educational and financial resources, the more they can contribute in a variety of ways to the quality of that school. They also have access to parents from all walks of life who can organise and assist with school trips and cultural activities, and otherwise enrich the classroom environment.
- Higher decile schools will have a positive peer effect on student learning, where students are motivated to work harder in the presence of motivated and successful peers.

Thrupp and Lupton (2006) reiterate these same points. Socio-economic composition affects school processes in numerous ways which would cumulatively boost the academic performance of schools in middle-class settings and suppress it in low socio-economic settings.

Research has found other factors that, while not confined to low-decile schools, may be more prevalent in them. These include potentially high-achieving students' suppressing their level of motivation so as not to be seen as 'geeks' or 'nerds' (Tyson et al 2005).

It is not possible to separate these factors or to include them individually in the analysis, but the salient point is that students from low-decile schools are more likely to leave school with lower levels of attainment, and have less experience learning in a motivated and motivating environment. What implications these have on the academic performance at university is taken up in the discussion.

4.5 Study type

Study type refers to the study load taken by a student. A student can be studying full-time or part-time for an entire year, or full-time or part-time for part of a year.

Most (94 per cent) of the study population were enrolled in full-time study for the full-year. The small numbers of students in other study types precluded a detailed analysis of this variable. The approach taken was to include all study types in the statistical analysis, to control for differences between them, but to only report the results for full-time full-year students, unless otherwise noted.

Scott (2006) found that the type of study was not a factor in passing courses, and that part-time students pass courses at the same or higher rate as students with larger study loads. In contrast,

the data in the present study suggest that full-time full-year bachelors students had higher likelihoods of completing most of their courses¹¹.

4.6 Gender

The sexes are not evenly represented in the population of students in this study, with female students making up 62 per cent of the total. A similar ratio is found in each of the sole- and ever-ethnic categories for each ethnic group, for students taking a gap year or not, and across the school decile categories. As noted in Engler (2010), this imbalance reflects differences in achievement levels between females and males in attaining NCEA qualifications.

There were some differences by gender. Male Pasifika students were more likely to take a gap-year than female Pasifika students (although there were relatively few male Pasifika students), and overall, there were proportionally fewer male students with higher achievement scores. There were also differences with study type. Disproportionately more males were studying part-time full-year and full-time part-year. The full-time full-year and part-time part-year study-type categories showed about the same gender ratios as the overall study population.

4.7 Type of attendance

The type of attendance refers to whether a student studies intra- or extramurally. In the data available for this study, just 238 students (0.7 per cent) were studying extramurally. This reflects the fact that take-up of extramural study at degree level is overwhelmingly by older students, whereas the study population comprises young people. All analyses in this report exclude extramural students.

4.8 School credentials

In the wider population of students from which the study population was drawn (table 3), 92 per cent (32,602÷35,618) had achieved the NCEA level 3 qualification. Ninety seven percent of the NCEA level 3 students had also gained UE. These 31,706 students comprise the study population. Of those students with UE, 95 per cent (31,706÷33,238) had gained level 3. For students whose highest school qualification was NCEA level 2, just over half (53 per cent) had gained the UE standard.

Table 3
Distribution of students (percent and number) by school credentials

	Other qualifications*	NCEA level 2	NCEA level 3	Total
Does not have UE	100% (100)	47% (1,384)	3% (896)	7% (2,380)
Has UE	0% (0)	53% (1,532)	97% (31,706)	93% (33,238)
Total	100% (100)	100% (2,916)	100% (32,602)	100% (35,618)

*Other qualifications include those from undertaking Cambridge International Examinations or International Baccalaureate, or an overseas qualification.

¹¹ At the time Scott undertook his study, the study-type variable used in this present study had not been developed. Instead, Scott used the number of courses a student enrolled in as an indicator of study load. In addition, while Scott's finding that studying full-time is not a success factor for passing courses is generally true across most levels of study, his data suggests that a medium study load improves course pass rates for bachelors-level study (refer to Scott (2006) table 7, page 7).

The likelihood of a student passing most of their courses in tertiary education varies with the type of credentials gained at school. Table 4 shows the results. It can be seen that gaining NCEA level 3 improves the likelihood of passing most courses (27 percentage points higher than those without NCEA level 3), regardless of whether the student also has UE. Having UE also improves performance (14 percentage point improvement on average), but having UE only provides an improvement when combined with level 3, not level 2. There are several possibilities as to why this latter result may have occurred, but it is likely to be a limitation of the data, rather than a ‘real’ result¹². In any case, the differences in tertiary academic performance across the different combinations of school credentials are such that it is preferable to limit the study population to students who have both NCEA level 3 *and* UE.

Table 4
Proportion of students passing most of their courses by school credentials

	NCEA level 2	NCEA level 3	Total
Does not have UE	58%	68%	62%
Has UE	42%	77%	76%
Total	50%	77%	75%

4.9 Subject studied

In this analysis, the subject studied is based on the broad field of study that has been assigned to the qualification a student is enrolled in. A qualification field of study is an imprecise measure for two reasons. First, many generic qualifications cover several fields, and this not reflected in the field of study assigned to a student. For instance, all students taking a Bachelor of Science are assigned to the field ‘natural and physical sciences’. This means a student studying a BSc in computing science is assigned to ‘natural and physical sciences’, not to information technology. Secondly, most degrees allow students to take courses in several broad fields. A more precise measure would be based on the fields of study of the *courses* a student has enrolled in. A full discussion of these differences can be found in Scott (2009b). For the purposes of this study, field of study is analysed at qualification level and by broad categories only.

The largest group of students (31 per cent of the total) in the study population were enrolled in courses in the qualification field of study ‘society and culture’, which includes studies in:

- humanities and social sciences
- law
- political science
- language and literature
- philosophy
- economics and econometrics
- sport and recreation.

The next largest group (23 per cent) were enrolled in the ‘natural and physical sciences’, which includes studies in:

- biological, earth and chemical sciences
- physics and astronomy

¹² The most likely reason is that students with NCEA level 2 without UE matriculated with Cambridge International Examination or International Baccalaureate qualifications.

- mathematical sciences.

The third largest group (20 per cent) were enrolled in ‘management and commerce’. Here studies include:

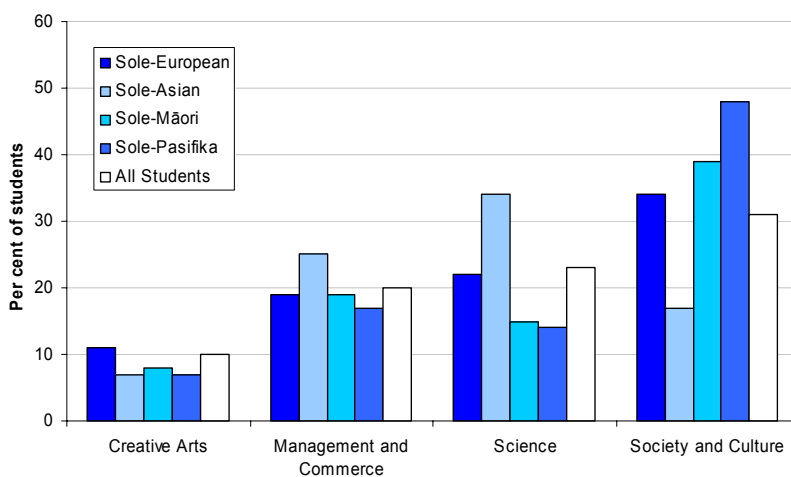
- accountancy
- business and management
- sales and marketing
- tourism
- office studies
- banking, finance and related fields.

The remainder of the students were enrolled in creative arts (10 per cent), health (5 per cent), education (4 per cent) and engineering (1 per cent), with a further 5 per cent in various other disciplines.

The small sizes of some of the subject fields precluded an exhaustive analysis using this factor. In this report, results are reported for all subjects studied, but in the more complex models used in the analysis, results are reported for ‘society and culture’, the largest group.

Figure 3 shows the distribution of students across the more popular subjects studied. Not all ethnic groups are equally represented in each field of study. Sole-Asian students are over-represented in management and commerce, and natural and physical sciences, and under-represented in society and culture. This preference of Asian students for subjects more aligned with mathematics, and less with literacy, has been found elsewhere (Ting 2000, Scott 2009b), and is attributed to them choosing to study in fields thought to lead to better-paid jobs, and because they are reputed to struggle with English. Sole-Māori and sole-Pasifika are over-represented in society and culture enrolments, and under-represented in the sciences.

Figure 3
Distribution of sole-ethnic students across the more popular subjects studied



This ethnic preference for particular subjects, and the fact that some subjects are traditionally more difficult to pass than others, will result in some confounding when ethnic group and subject studied is not controlled.

5 RESULTS

This section presents the results of the data modelling. A discussion of the results is in the next section.

Logistic regression was used to model the likelihood of passing most (more than 75 per cent) bachelors-level courses by first-year students at university between 2006 and 2008. The independent variables considered were achievement at school (NCEA level 3 achievement score), timing of progression to tertiary study after leaving school, and the decile rating of the last school attended. Separate models were run for these variables together with the individual ethnic groups. Factors included in additional models were the student's gender and ethnicity, and subject studied and study type.

Table 5 shows the goodness of fit statistics for the range of models used.

Table 5
Goodness of fit statistics for the regression models used in the study

Model	Variables used in the models							Adjusted R ²	C [†]
	Achievement score	Gap year	School decile	Study type	Subject studied	Ethnic group	Gender		
1	✓							0.2160	0.763
2	✓	✓						0.2179	0.764
3	✓		✓					0.2163	0.763
4	✓			✓				0.2160	0.763
5	✓				✓			0.2543	0.785
6*	✓					✓	✓	0.2269	0.769
7	✓	✓	✓					0.2583	0.779
8*	✓	✓	✓			✓		0.2544	0.779

[†] The C statistic is the probability of a student actually passing most of their courses having a higher probability of doing this (estimated from the model) than a student who has not actually passed most of their courses.

* Indicates that series of models combining the indicated factors, and each of the ethnic groups in turn. The R² and C values shown are the lowest for the series of four models.

The data is mostly presented in graphical form, with means and 90 per cent confidence intervals. 90 per cent confidence intervals are used so that readers comparing the intervals between two means can be at least 95 per cent certain that the means are significantly different. The reasons why this apparently counter-intuitive approach is necessary can be found in Schenker and Gentleman (2001).

5.1 Academic achievement at school

In the study population, 77 per cent of students pass most of their courses. However, academic achievement at school has a strong bearing on this. Figure 4 shows the likelihood of passing most courses by achievement score. It can be seen that at the lower end of the achievement score range, about 2 to 4 out of every 10 students pass most of their courses, while at the upper end of the range, nearly all students pass most of their courses. At the average achievement score (about 50), students have an 83 per cent chance of passing most of their courses.

The next sections show how other variables modify this overall relationship between tertiary academic performance and success at school.

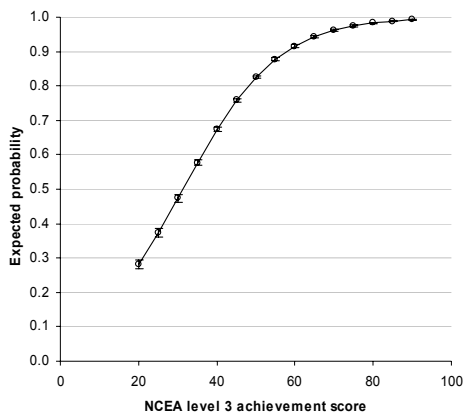
5.2 School decile

Overall, the decile of the last school the student attended plays a relatively minor role in academic performance once a student reaches university (figure 5), although the differences between decile categories are statistically significant. The results show:

- At the lowest achievement scores (20–25) there are no significant differences between the three decile categories, although the order (from highest academic performance to lowest) is mid- to low- to high-decile schools.
- For low to middle achievement scores (30-50), students from mid-decile schools have significantly higher levels of academic performance, and above 40, high-decile school students are also significantly higher than low-decile school students.
- For achievement scores above 50, mid- and high-decile school students' tertiary academic performance is not significantly different, but students from low-decile schools show a significantly lower level of tertiary academic achievement at all but the highest NCEA level 3 achievement scores.

Figure 4

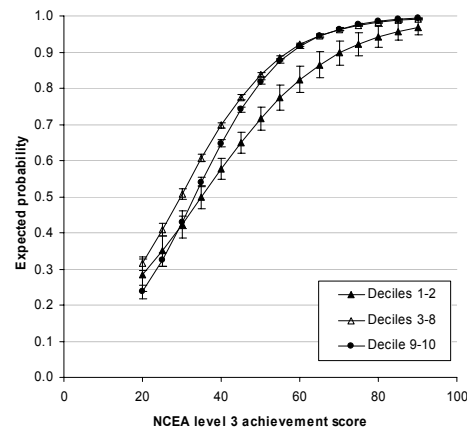
Expected probability (and 90 per cent confidence limits) of passing most courses by NCEA level 3 achievement score



Results are calculated using all ethnic groups, all study types, all subjects studied, all school decile categories, gap and no gap year students and both genders. Excludes extramural students.

Figure 5

Expected probability (and 90 per cent confidence limits) of passing most courses by NCEA level 3 achievement score and school decile



Results are calculated using all ethnic groups, all study types, all subjects studied, gap and no gap year students and both genders. Excludes extramural students.

5.3 Study type

If a student studies full-time full-year, the chances of passing most of their courses overall is higher than if they have a lighter study load (see figure 6). It is only at the extreme ends of the achievement score range that study type has less bearing on academic performance.

Part-time full-year study is associated with the lowest academic performance, mostly in the upper part of the achievement score range, but over most of the range the differences between this and the other non full-time full-year study types are not statistically significant.

It is likely that study load itself does not directly affect the chances of passing most courses. More likely, it is the reasons why students do not study full-time full-year that affect academic

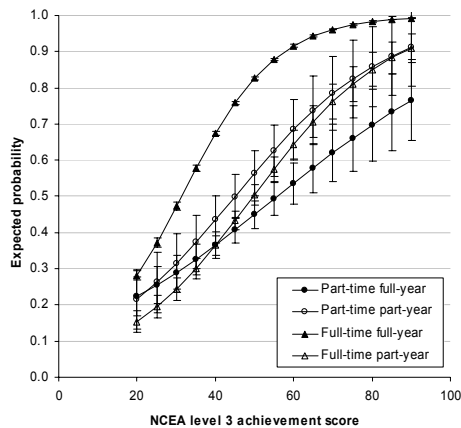
performance. Specifically, paid work or family commitments, which preclude full-time full-year study, will take time and focus away from study.

5.4 Timing of progression

Taking a year off between school and starting university bachelors study significantly improves the likelihood of passing most courses for students with below-average school achievement scores (figure 7). It should be noted that few students take a gap year (8 per cent in the study population), and those that do, who have below-average achievement scores, are about half this total again. In the study population, just over 1,300 students showed improved academic performance after taking a year off before starting tertiary study. Overseas studies have generally attributed this improvement to increased motivation (for example, see Birch and Miller 2007). Holmlund et al (2008) suggest that students with lower school results may be waiting for better educational opportunities.

Figure 6

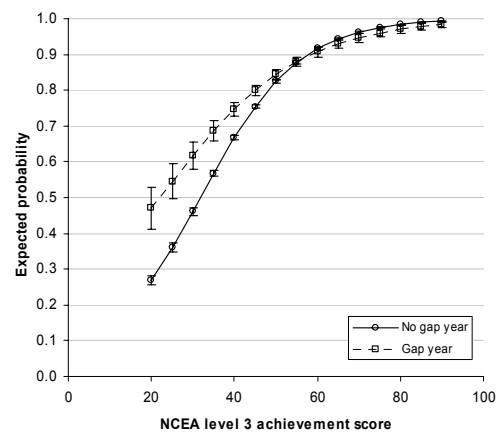
Expected probability (and 90 per cent confidence limits) of passing most courses by NCEA level 3 achievement score and study type



Results are calculated using all ethnic groups, all subjects studied, all school decile categories, gap and no gap year students and both genders. Excludes extramural students.

Figure 7

Expected probability (and 90 per cent confidence limits) of passing most courses by NCEA level 3 achievement score and whether or not the student took a gap year



Results are calculated using all ethnic groups, all study types, all subjects studied, all school decile categories and both genders. Excludes extramural students.

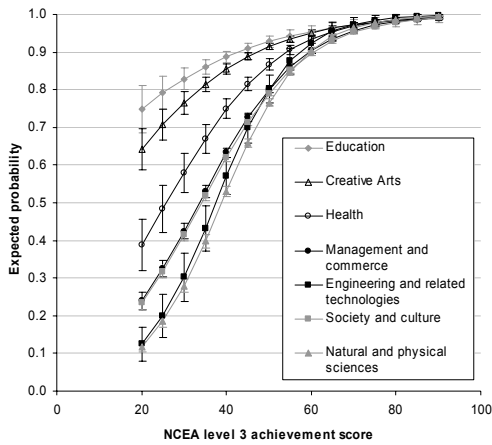
5.5 Subjects studied

The subject studied plays an important role in determining university performance for students with below-average school achievement; for students with above-average school achievement, the subject studied has almost no bearing on success (figure 8). This would suggest that some subjects are easier to pass than others.

Figure 8 shows that students in creative arts and education have relatively higher chances of passing most of their courses, even for students with the lowest achievement scores. This is in contrast to all other subjects shown, where students with below-average school achievement have very low likelihoods of passing most courses. Students in natural and physical sciences have the lowest likelihood of passing most of their courses.

Figure 8

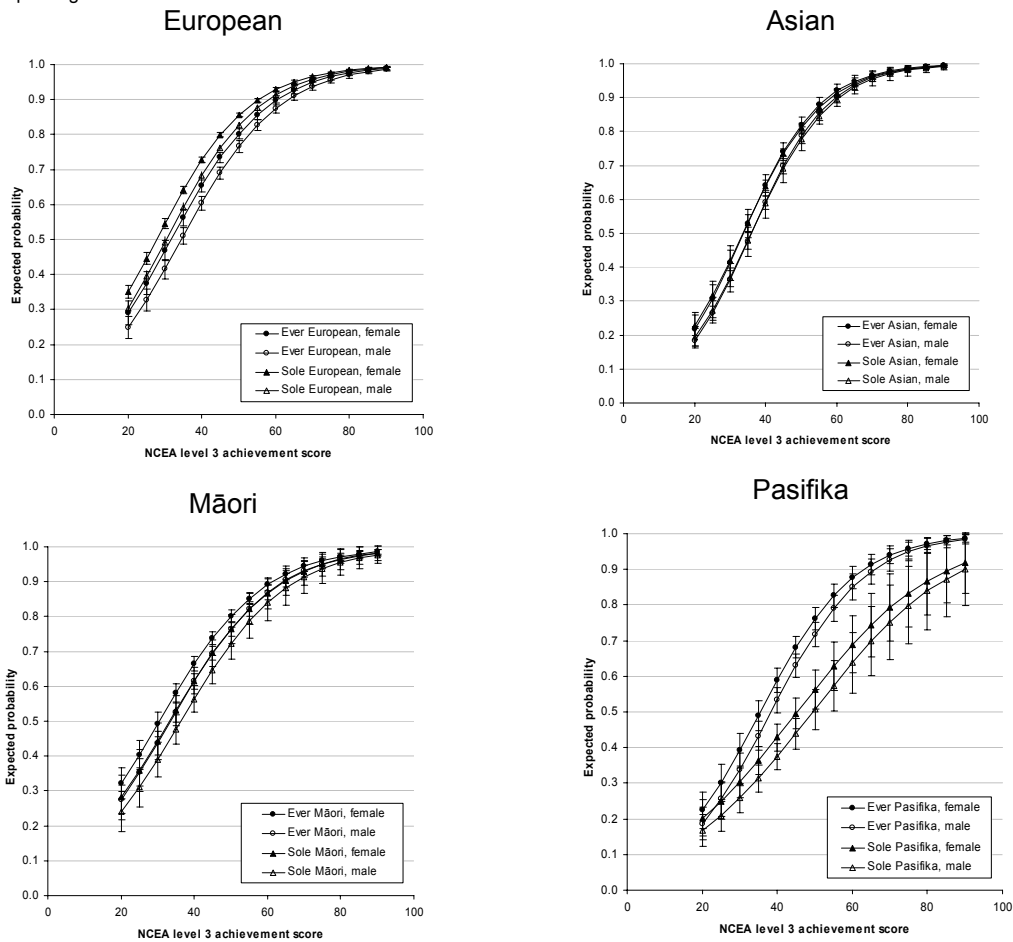
Expected probability (and 90 per cent confidence limits) of passing most courses by NCEA level 3 achievement score and subject studied



Results are calculated using all ethnic groups, all study types, all school decile categories, gap and no gap year students and both genders. Excludes extramural students.

Figure 9

Expected probability (and 90 per cent confidence limits) of passing most courses by NCEA level 3 achievement score, ethnic group and gender



Results are calculated using all study types, all subjects studied, all school decile categories, and gap and no gap year students. Excludes extramural students.

5.6 Ethnic group and gender

When controlling for gender, ethnic group and achievement score, there is little difference in the likelihood of passing most courses between male and female students (figure 9)¹³. Only for sole-European female students is the likelihood significantly higher, but then only for the middle range of achievement scores. Over all school decile categories, sole-Pasifika students with middle range achievement scores have a significantly lower likelihood of passing most of their courses, than similar ever-Pasifika students.

5.7 Ethnic group and school decile

Figure 10 shows the results by ethnic group and school decile. There are four pairs of graphs, arranged vertically, with each pair showing the results for the ever- and sole- ethnic group categories for each ethnic group. In each graph the results for the three school decile categories are displayed.

A common pattern can be seen in all graphs, with much lower likelihoods of students passing most of their courses when their school achievement scores are low, and there being near certainty that most courses are passed for students with higher school achievement. This is the overall pattern seen in figure 4. There are also almost no differences within ethnic groups. However, there are some important departures from the common pattern.

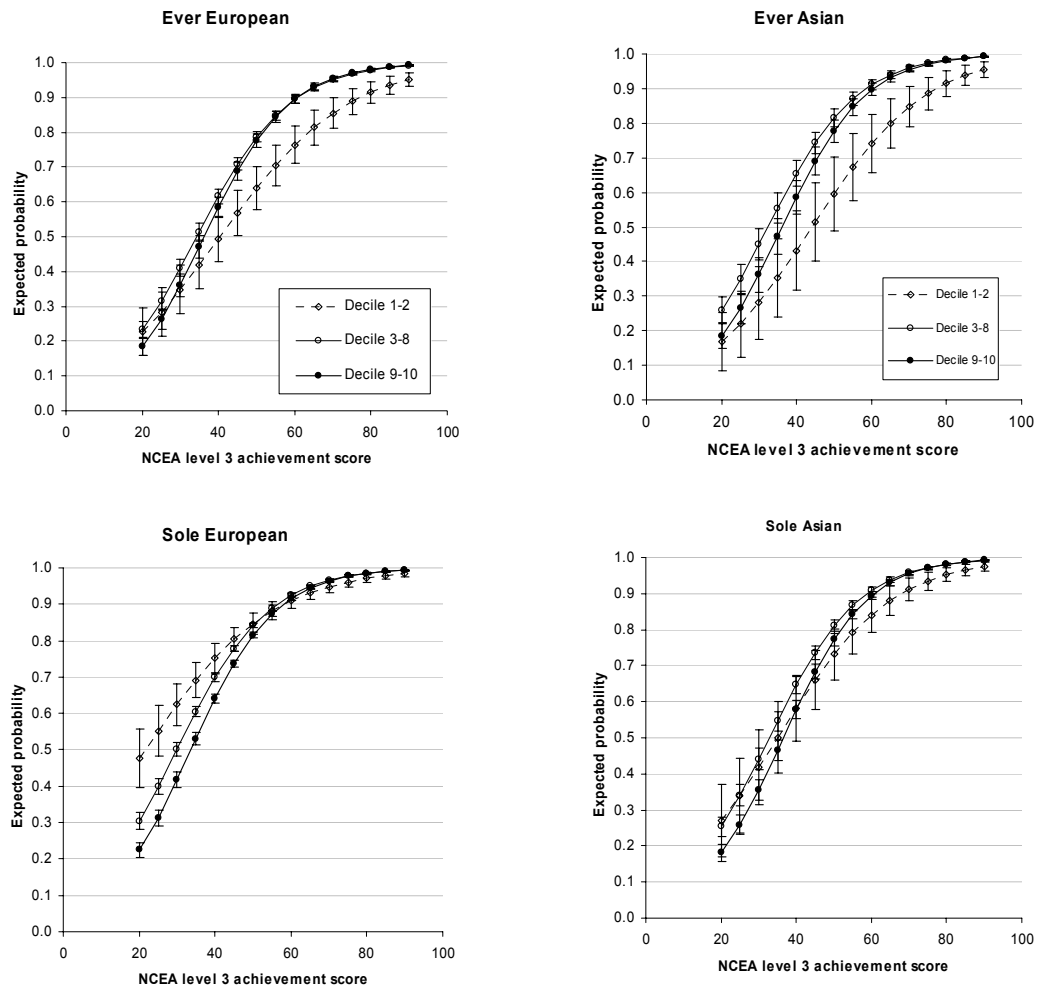
Apart from the sole-European and sole-Asian ethnic groups, all students with higher achievement scores from low-decile schools have a lower chance of passing most of their courses. This varies from slightly less (but significantly) so for Māori, ever-European and ever-Asian students, to quite large differences for Pasifika students. On the other hand, students from middle and high-decile schools for all achievement scores show essentially the same pattern.

Sole-Asian students from low-decile schools have course pass likelihoods slightly lower but not significantly different from sole-Asian students from other schools. The more intriguing result is for sole-European students. Here, students with lower achievement scores, from low-decile schools, have significantly *higher* likelihoods of passing most of their courses compared to similar students from other schools. Students from mid-decile schools also have significantly higher likelihoods of academic performance than their peers from high-decile schools. At the upper end of the achievement score range, all sole-European students have essentially equal likelihoods. The possible reasons for this are considered in the discussion.

¹³ The odds of female students passing most of their courses are significantly higher than the odds for males, for all ethnic groups other than Pasifika. Odds are ratios of probabilities, not probabilities themselves. The report confines itself to reporting probabilities, and in most cases, the results for odds and probabilities are much the same.

Figure 10

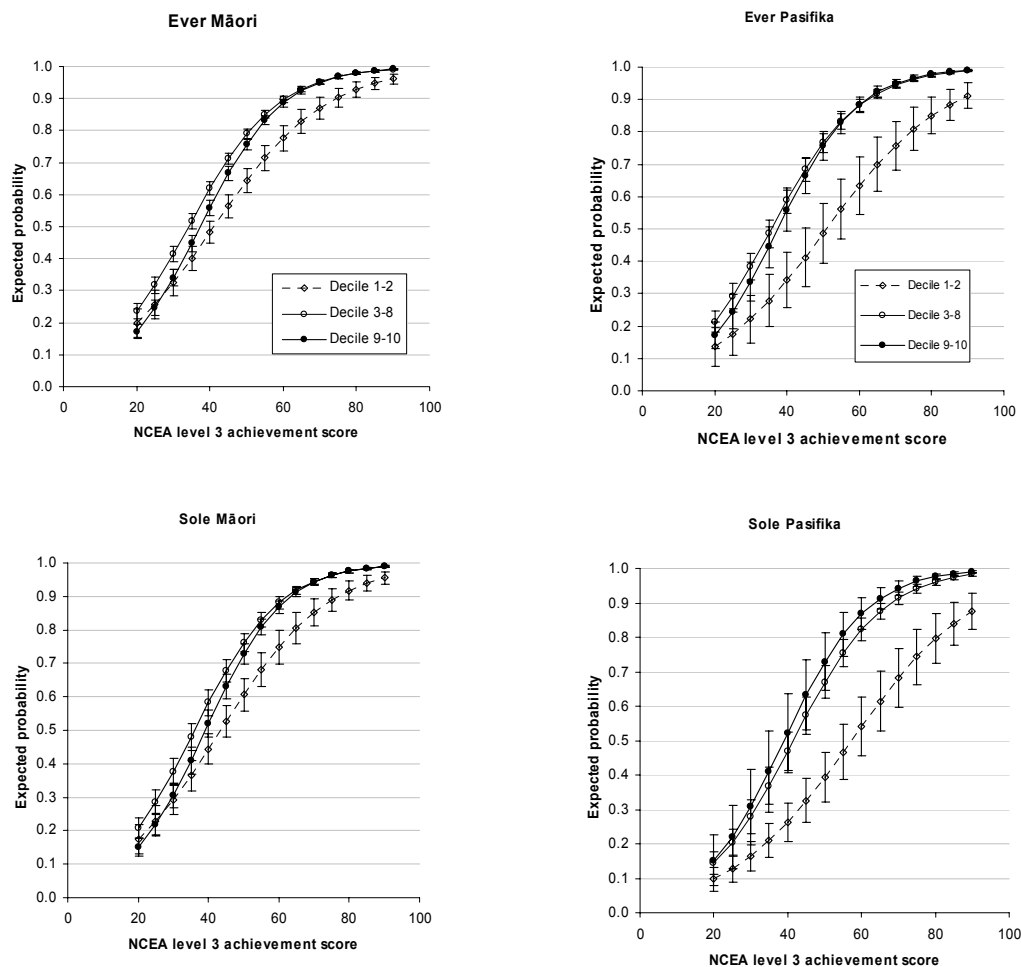
Expected probability (and 90 per cent confidence limits) of passing most courses by NCEA level 3 achievement score and school decile and ethnic group



Results are calculated using all study types, all subjects studied, both genders, and gap and no gap year students. Excludes extramural students.

Figure 10 (continued)

Expected probability (and 90 per cent confidence limits) of passing most courses by NCEA level 3 achievement score and school decile and ethnic group



5.8 School decile and gap year

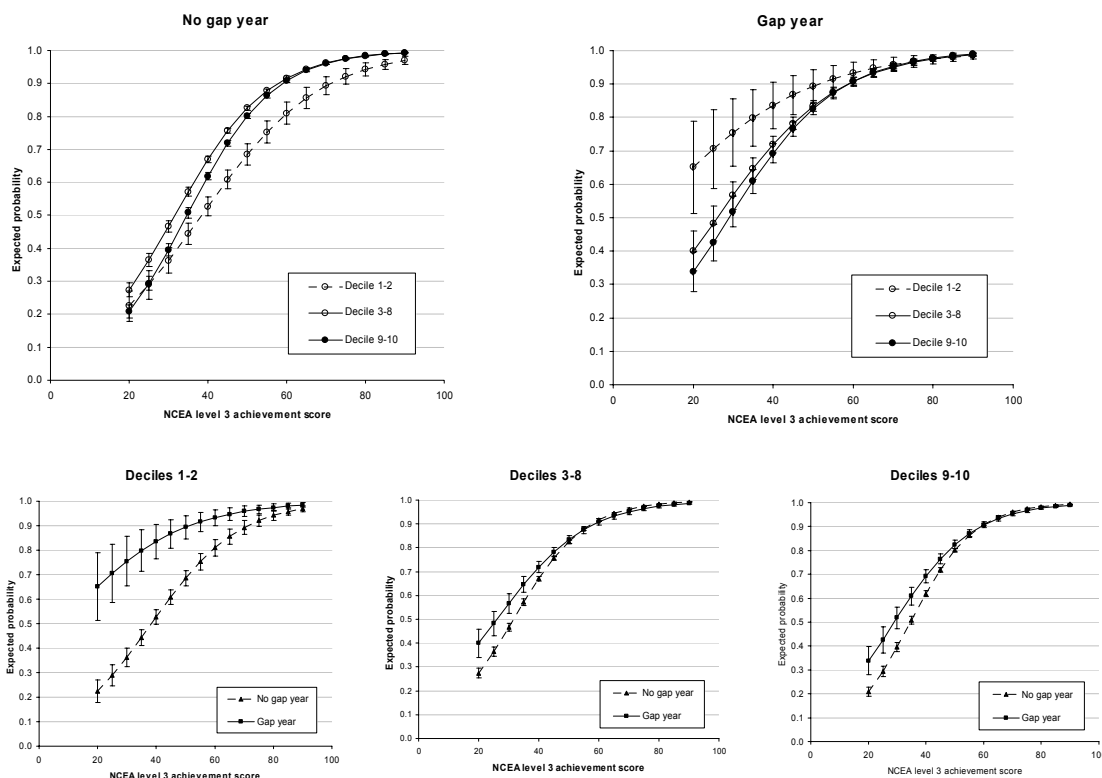
It has been shown that students with below-average achievement scores have higher likelihoods of passing most of their courses if they take a year off before starting their tertiary studies (figure 7). However, the extent of the improvement in university performance depends on the school the student attended, and as will be shown, to which ethnic group they belong.

Figure 11 shows the expected likelihood of passing most courses by school decile categories. It can be seen that the improvement in performance with a gap year is significantly higher for students from low-decile schools. This improvement is dramatic. Comparing the top two graphs in figure 11, it can be seen that the students from low-decile schools have a significantly higher likelihood of passing most of their courses for achievement scores below 50, in contrast to the results for students who do not take a gap year. Then, for students with achievement scores above 50, the students from low-decile schools match the academic performance of other students. Again, this is in contrast to the pattern seen for students who progress directly to tertiary study. The lower three graphs in figure 11, which present the same data, show the comparison by students who take a gap year or not. Again, the improvement for low-decile

school students is quite clear, while the difference for mid- and high-decile school students is minor by comparison, and much the same as each other.

Figure 11

Expected probability (and 90 per cent confidence limits) of passing most courses by NCEA level 3 achievement score and timing of progression to tertiary study and school decile



Results are calculated using all ethnic groups, all study types, all subjects studied, and both genders. Excludes extramural students.

There is a small but significant increase in the chance of passing most courses for each of the school decile categories. Taking a year off certainly improves the chances of passing. But the improvement is outstanding for students from low-decile schools.

It should be noted there are very few low-decile school students who take a gap year. This is partly because so few low-decile school students make it to tertiary study in the first place, and as was noted earlier, students from low-decile schools are less likely to take a gap year. In the study population, 8 per cent of students overall take a gap year, compared to 4 per cent for students from decile 1-2 schools. In the study population, 1,075 students come from low-decile schools, and of these, just 47 took a gap year.

5.9 Gender and gap year

Birch and Miller (2007) also found that students with below-average achievement scores who took a gap year have higher marks in their tertiary studies. However, they also found that for female students, the gap year improvement occurred whether they were low- or high-performing students; for males it was only for low-performing students who benefited from the gap year. That is, Birch and Miller found there was a gender by gap year interaction.

This finding was tested with the study population of the present analysis. It should be noted, however, that the dependent variable was slightly different between this and Birch and Miller's study. They considered marks, while the present study considers the proportion of courses passed. The results (not shown) indicate that while there are significant differences in the odds of passing most courses by gender, academic performance for male and female students does not vary with school achievement, school decile or the timing of progression to tertiary study. Birch and Miller offer no explanation for their finding. The results in the present study will be considered in the discussion.

5.10 School decile and gap year for each ethnic group

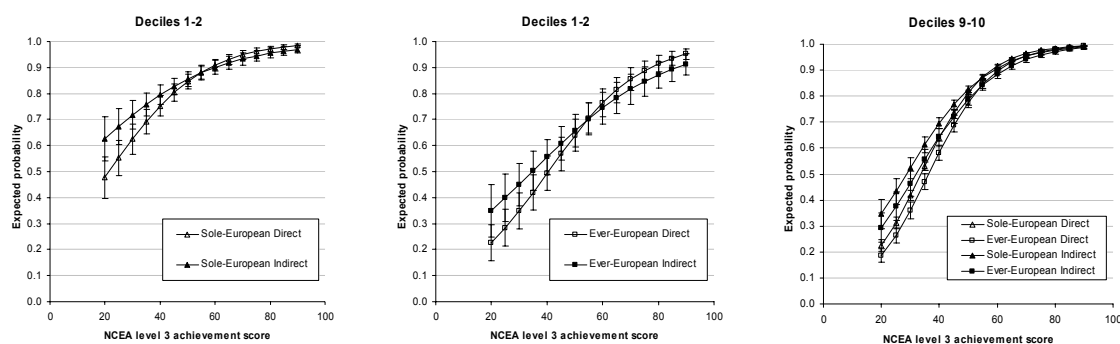
There are differences between ethnic groups in the likelihood of passing most courses by school decile, and whether or not the student took a gap year. Sample sizes for some of these categories are small, so there is less certainty about the results, and confidence limits are necessarily wider. Caution should therefore be exercised if using these results. Notwithstanding, the trends shown by these results are informative, and in spite of the wide confidence limits, significant differences can be seen for some groups.

European ethnic group

Contrary to the previous finding, European students do not show a significant improvement in their university performance after taking a year off before starting tertiary study (figure 12). As was seen previously (figure 10) sole-European students from low-decile schools out-performed their peers, in contrast to all other ethnic groups. This result is seen here again. For students from low-decile schools, the sole-European ethnic group shows the highest likelihood of passing most courses at the lower end of the achievement score range. While taking a gap year increases the likelihood, the increase is not significant. For students from high-decile schools, taking a gap year also marginally increases academic performance, but again, not significantly so.

Figure 12

Expected probability (and 90 per cent confidence limits) of passing most courses by NCEA level 3 achievement score, school decile and timing of progression to tertiary study for the European ethnic group



Results are calculated for full-time full-year students studying Society and Culture subjects, for both genders. Excludes extramural students.

In addition, while there are some differences between ever-European and sole-European students from low-decile schools, again at the lower end of the school achievement range, there are essentially no differences within the European ethnic group for students from high-decile schools. In particular, the tertiary academic performance of ever-European students from low-decile schools is much the same as their counterparts from high-decile schools, and like these latter students, shows only a marginal improvement after taking a gap year.

For sole-European students from low-decile schools, the NCEA level 3 achievement score is not a good predictor of tertiary academic performance, since essentially all students along the achievements core continuum have a better than even chance of passing most of their courses.

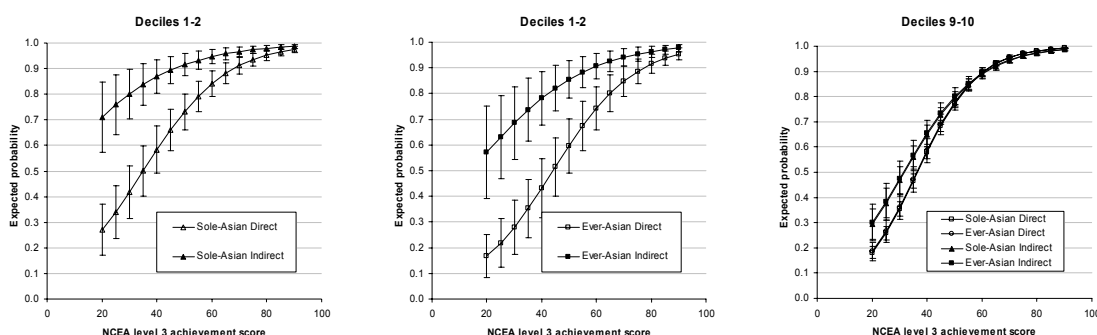
Asian ethnic group

In contrast to the European ethnic group, the Asian ethnic group shows almost no within-ethnic group variation (figure 13). The only difference is that sole-Asian students from low-decile schools with lower school achievement have slightly higher likelihoods of passing most of their tertiary courses than ever-Asian students from low-decile schools, but the difference is not statistically significant. In addition, and again in contrast to European students, for students from low-decile schools, there is a significant improvement in tertiary academic performance after taking a gap year. While there is a slight improvement in academic performance for students from high-decile schools taking a gap year, it is not significant.

For Asian students from low-decile schools who took a gap year, school achievement is not as good a predictor of tertiary academic performance as it is for students who progressed directly to tertiary education, or for those from high-decile schools.

Figure 13

Expected probability (and 90 per cent confidence limits) of passing most courses by NCEA level 3 achievement score, school decile and timing of progression to tertiary study for the Asian ethnic group



Results are calculated for full-time full-year students studying Society and Culture subjects, for both genders. Excludes extramural students.

The improvement after taking a gap year for students from low-decile schools occurs across almost the entire range of achievement scores. Only at the highest achievement scores, above 70, is the difference not statistically significant. The improvement in tertiary academic performance of students from low-decile schools who took a gap year surpasses that of all Asian students from high-decile schools.

Māori ethnic group

The Māori ethnic group shows essentially the same pattern as the Asian ethnic group (figure 14). There are no significant differences within the Māori ethnic group, that is, between the sole- and ever-Māori ethnic group categories. There is a significant improvement in tertiary academic ability after taking a gap year for students from low-decile schools. This improvement again occurs over almost the entire range of school achievement. And again, the students from low-decile schools who take a gap year surpass nearly all other Māori students in tertiary academic performance; they equal the performance of the students with the very highest school achievement.

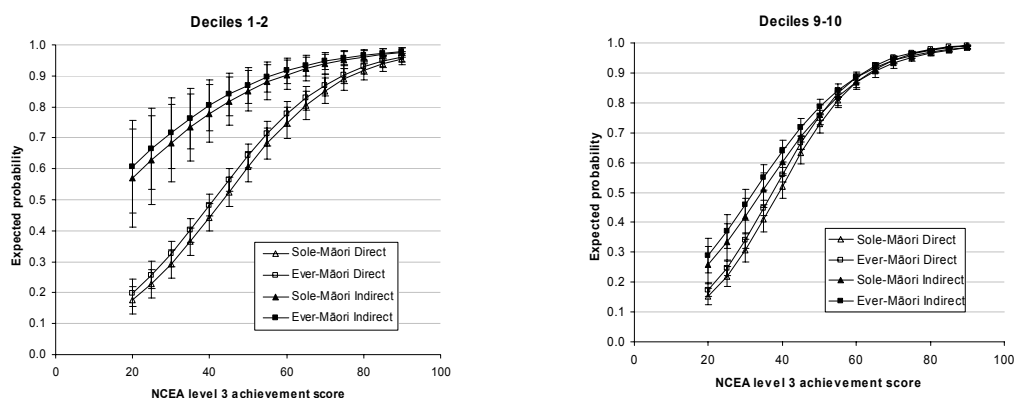
Like the situation for Asian students, the achievement score is not as good a predictor of tertiary academic performance for Māori students who took a gap year and attended low-decile schools, compared to Māori students who progressed directly, or those from high-decile schools.

Pasifika ethnic group

This ethnic group, particularly the sole-Pasifika category, is the least represented in the study population, and any analysis at this level of breakdown necessarily will be less reliable, as evidenced by the much wider confidence limits. The results are presented nevertheless to show trends. In a few years time, when more data is available, this analysis can be strengthened.

Figure 14

Expected probability (and 90 per cent confidence limits) of passing most courses by NCEA level 3 achievement score, school decile and timing of progression to tertiary study for the Māori ethnic group



Results are calculated for full-time full-year students studying Society and Culture subjects, for both genders. Excludes extramural students.

The results for the Pasifika ethnic group, even allowing for the wide confidence limits, are quite different from the other ethnic groups (figure 15). There is no improvement in tertiary academic performance for the sole-Pasifika group after taking a gap year for students from low-decile schools, and there is a suggestion that for high-decile school students, taking a gap year has a detrimental effect on performance, across most of the school achievement range. Even with the limited data used here, there is a significant decline in the likelihood of passing most courses for these students at the upper end of the school achievement range.

Ever-Pasifika students' results exhibit the pattern seen for Asian and Māori students; an improvement in academic performance for students from low-decile schools after taking a gap year, across nearly the whole range of school achievement. There are therefore quite marked differences within the Pasifika ethnic group.

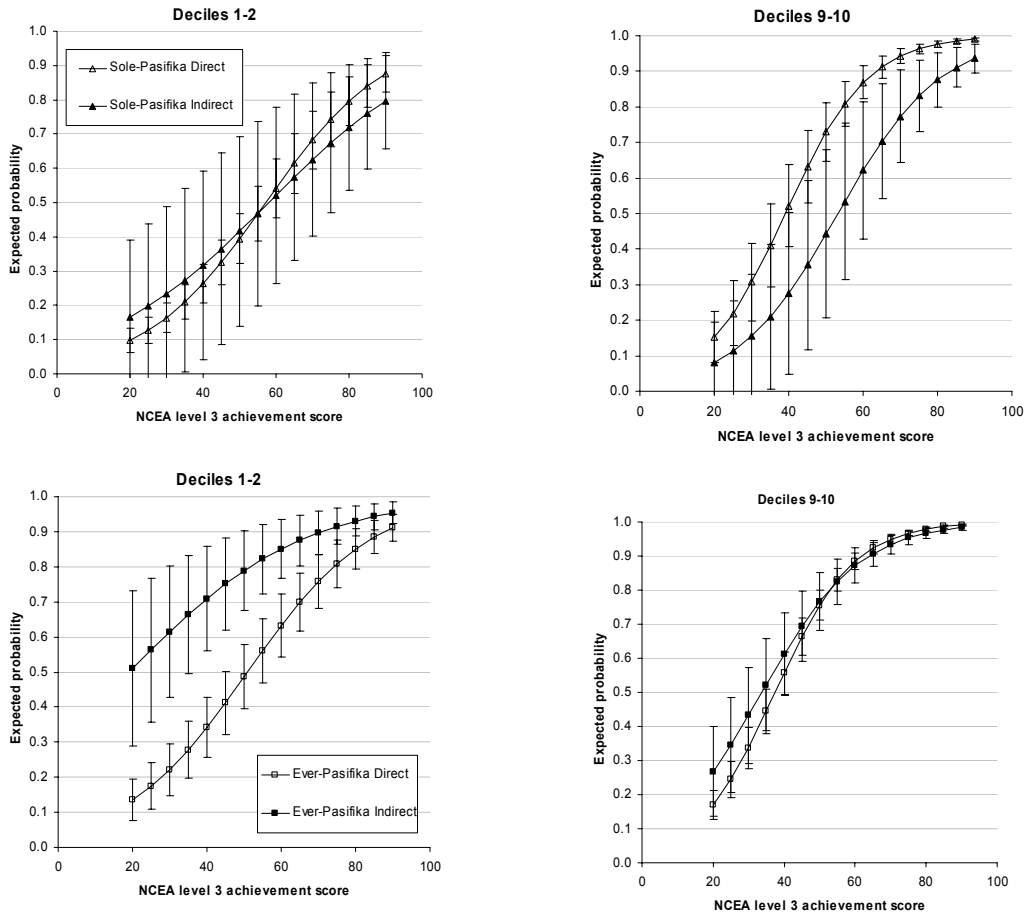
For Ever-Pasifika students who took a gap year and attended low-decile schools, the achievement score is not as good a predictor of tertiary academic performance as those who progressed directly to tertiary education, or those from high-decile schools.

5.11 School decile and gap year for the sole-ethnic group category

The previous set of graphs (figures 12 to 15) highlights the comparison between students taking a gap year or not *within* ethnic groups. The same data, for the sole-ethnic categories, can be reproduced to show differences between the ethnic groups. This highlights the quite different outcomes from students of sole-Pasifika ethnicity. Between-ethnic group comparisons are only possible with the sole-ethnic group categories, since the ever-ethnic categories overlap.

Figure 15

Expected probability (and 90 per cent confidence limits) of passing most courses by NCEA level 3 achievement score, school decile and timing of progression to tertiary study for the Pasifika ethnic group



Results are calculated for full-time full-year students studying Society and Culture subjects, for both genders. Excludes extramural students.

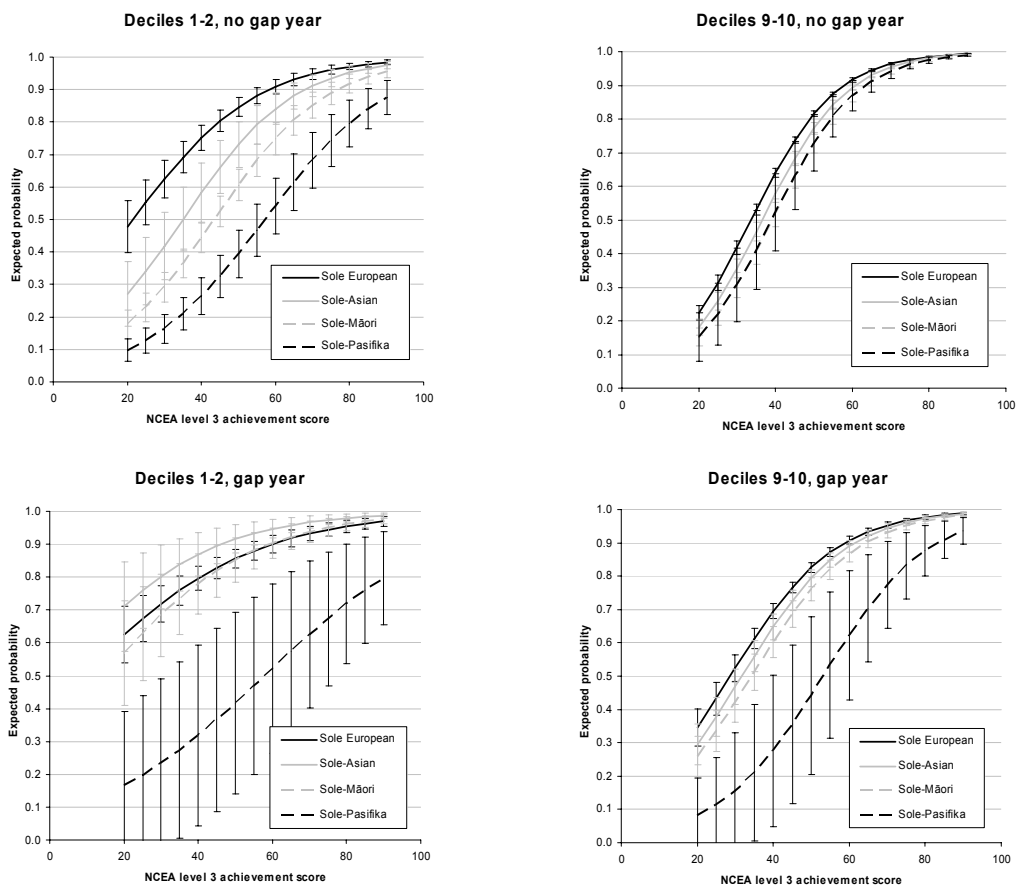
Figure 16 shows the results. Again, wide confidence limits can be seen for the Pasifika results, due to there being so few of these students studying at this level, particularly those who took a gap year. There are also relatively fewer low-decile school students.

Firstly, note that for students from high-decile schools who did not take a gap year, the results for each of the ethnic groups is very similar. There is a statistical difference between the sole-European and the sole-Asian and sole-Māori results for the middle achievement score range (not discernable in the figure), but the sole-Pasifika confidence limits overlap all the other ethnic group's results. The Māori and Asian trend lines are so similar they are indistinguishable in the figure.

In contrast, there are quite divergent results for students from low-decile schools who did not take a gap year. Sole-European students out-perform other students except at the very highest achievement scores, and while there is no statistical difference between the Asian and Māori results, Pasifika are significantly less academically successful.

Figure 16

Expected probability (and 90 per cent confidence limits) of passing most courses by NCEA level 3 achievement score, school decile, timing of progression to tertiary study and sole-ethnic group



Results are calculated for full-time full-year students studying Society and Culture subjects, for both genders. Excludes extramural students.

Comparing the upper two graphs with the lower two in figure 16, the reader can again see the improvement in academic performance for students taking a gap year, especially for those from low-decile schools, and this occurs for all ethnic groups other than Pasifika. For the students from low-decile schools, sole-Asian students have the highest likelihood of passing most of their courses, but the Asian, Māori and European trend lines are not statistically different. As seen previously, the levels of academic performance for these groups, in the main, exceeds those of the students who did not take a gap year. There are also no significant differences between the Asian, Māori and European ethnic groups for students from high-decile schools who took a gap year.

It is clear that sole-Pasifika students' academic performance is significantly different from other students, even when controlling for school decile, timing of progression, and academic achievement at school. Only for students from high-decile schools, and who do not take a gap year, is there parity in academic performance. Unfortunately, very few (12 per cent) sole-Pasifika students attend a high-decile school. In the study population, this equates to 84 students, 79 of whom did not take a gap year.

6 DISCUSSION

This section will draw together the major themes emerging from the analysis. The discussion will be guided by the following questions:

- Why do sole-European students with lower school achievement from lower-decile schools show higher levels of university performance when compared with similar students from other schools?
- Why is the taking of a gap year beneficial to some students, but not others?
- Are there particular reasons why Pasifika students' results are different from other ethnic groups?

The section also includes a short discussion of low achieving students in general, and some comments on the likely effect that the uneven geographic distribution of students with particular demographic characteristics might have on individual institutions.

Why do sole-European students with lower school achievement from lower-decile schools show higher levels of university performance when compared to similar students from other schools?

The focus for this question is on students who progress directly to tertiary education. The question explores the patterns seen in figure 5 for the overall result and figure 10 for the breakdown by ethnic group.

Figure 5 shows the overall patterns, averaged over all ethnic groups. Students who come from low-decile schools, who progress directly to tertiary education, and who have medium to high school achievement, show lower levels of tertiary academic performance than their peers in other schools.

When considered by ethnic group (figure 10), this pattern is seen broadly to apply to all students except sole-European students. Sole-European students from low-decile schools with NCEA achievement scores under 50 out-perform most other students with equivalent school achievement if they start university directly after leaving school. In addition, sole-European students from mid-decile schools also out-perform students from high-decile schools in the low to mid achievement score range. Mid-decile school students from other ethnic groups may also out-perform high-decile school students in their tertiary studies, but mostly not significantly so.

It is suggested that this higher tertiary academic performance by lower decile school students can be accounted for (in part) by the fact that in high-decile schools, students do better at school than their actual ability suggests. In other words, in high-decile schools, the NCEA achievement score may be over-estimating their ability. As a consequence, when school achievement is controlled for, the high-decile school students' actual performance in tertiary education lags behind other students. For students with above-average school achievement, there is little difference in tertiary academic performance, since for these students their performance is relatively insensitive to school characteristics (Smith and Naylor 2001).

Minority ethnic group students¹⁴, with above-average school results, don't seem to perform as well, but the reasons for this are not as clear. Various hypotheses have been proposed in the literature. While this study is not able to account for the difference, it is clear that it is a real effect. But minority ethnic group students' performance is lower only among those who

¹⁴ All those ethnic group categories other than sole-European.

attended low-decile schools (figure 10 and figures 12 to 15). In other words, there is an ethnic group–school interaction.

The evidence for these two propositions will be briefly outlined.

Over-estimating ability

There is evidence from Australia that suggests students from non-government schools¹⁵ do not do as well at university as government school students, once academic performance at school is controlled (Win and Miller 2005). This is attributed to non-government students' school scores over-estimating their actual academic ability, because of superior resources and more attentive coaching by teachers, resulting in higher scores (Win and Miller 2005). Wealthier parents may also pay for extra coaching and assistance for their children. Birch and Miller (2007) found a similar result for socio-economic status. When they controlled for school achievement, they found that students' predicted first year university marks were highest for middle socio-economic-status students, then lower for those from the lowest socio-economic status, and the lowest was seen for the highest socio-economic-status students. They attributed this to the correlation between income and attendance at government or non-government schools.

Similar results have been reported in the United Kingdom. There, students from Local Education Authority (LEA) schools had a significantly higher chance of obtaining a good degree¹⁶ compared to students from Independent schools, after controlling for school performance. In particular, for the same likelihood of gaining a good degree, the average Independent school student needed about one grade higher at A-level than the LEA-educated student for each of their three A-level subjects (Smith and Naylor 2001).

Another Australian study, at Monash University, also found similar results. The 'pecking order' of school results, from private, to Catholic, to Government schools, was 'neatly reversed' when considering the students' university results (Dobson and Skuja 2005). In all studies, children from more privileged families obtained on average higher school results, but did not perform as well at university, given their level of school achievement.

In the present study it also appears that students from high-decile schools generally have depressed tertiary academic performance relative to other students when controlling for school achievement¹⁷. It is also likely that, if the achievement scores for high-decile students *over-estimate* ability, then low-decile school students' achievement scores may *under-estimate* ability, at least for some students. The same attributes that are seen as boosting students' achievements in high-decile schools, will be lacking in low-decile schools and will depress the achievement scores of some students. When controlling for achievement at school, these low-decile school students, on average, perform significantly higher than would be expected compared to the average result.

Is this a self-selection effect? That is, are only the more motivated students from low-decile schools with below average school achievement choosing to progress to bachelors study? Certainly students with lower school achievement are less likely to go on to tertiary study

¹⁵ In Australia these are independent, or Catholic, and private schools.

¹⁶ A good degree is defined as at least a first class or upper second class honours degree, compared to lower second class honours degree, third class honours degree or less.

¹⁷ It could be that high-decile students are disproportionately enrolling in the more difficult subjects. However, this is not the case, since, regardless of the difficulty of the qualification, students from all decile categories are more or less evenly represented. For low-decile school students, 21 per cent are enrolled in natural and physical sciences, compared to 24 per cent of mid-decile school students, and 23 per cent of high-decile school students. For society and culture, the respective proportions are 34, 31 and 31 per cent. The largest difference was for management and commerce, where 17 per cent of low-decile students enrolled in this subject, 19 per cent of mid-decile students, and 21 per cent of high-decile students.

(Engler 2010); the lower school grades might be more de-motivating for students from low-decile schools than other schools.

However, this is not likely to be a self-selection effect for the reason that there is no difference in the likelihood of progressing onto bachelors study between students from the different school decile categories for students from the lower end of the school achievement score range (Engler 2010, figure 2). For sole-European students, for which the effect is most prominent, there is no difference in the likelihood of progressing on to tertiary study across the entire range of school achievement.

This suggests that this phenomenon may result from schooling factors, with high-decile schools doing better than low-decile schools at getting students of modest ability through school assessments.

Low-decile school students' under-achievement

Next we look at the causes for the under-performance in other ethnic groups generally, and particularly for minority ethnic group students from low-decile schools.

Spenner et al (2004) reviewed the minority achievement gap, and concluded that while family background, parental involvement, prior ability and cultural capital acquired during the middle- and high-school years produce a moderate reduction in the achievement gap, over half of the gap remains unexplained. They cite research that suggests that minority achievement differences emerge as early as pre-school and kindergarten. Nora and Cabrera (1996) quote Tinto, who reasoned that rather than socio-economic background, the reason minority students fared worse was because of differences in academic preparedness, arising from prior educational experiences at elementary and secondary school, which favoured non-minority students. To date, no-one has been able to demonstrate clearly why minority groups have lower levels of educational achievement. It is likely that more than one factor is at work, and the list will undoubtedly include various difficult-to-measure psychological factors as well. That there is at least a school effect is supported by this present study, which shows that it is only minority ethnic group students from *low-decile schools* who show educational under-performance. As was discussed previously (pages 13–14), there are a number of characteristics of low-decile schools that contribute to a poorer preparation for tertiary study.

Why is the taking of a gap year beneficial to some students, but not others?

The results underpinning this question are seen in figure 7, figure 11, and figures 12 to 15.

Figure 7 shows the results controlling for achievement score and gap year status, and indicates significant improvement in academic performance for gap-year students up to achievement scores of 50. There is some suggestion in the figure that taking a gap year decreases academic performance for some students with high school achievement, but the difference is minor and not significant.

Figure 11 shows the data controlling for school decile, averaged across all ethnic groups. Students who do *not* take a gap year show the pattern discussed in the previous section; for students who *do* take a gap year, academic performance is improved for students from all schools. However, those from low-decile schools out-perform (or equal) students from other schools, including most other students who did not take a gap year.

Figures 12 to 15 show the data further controlled for ethnic group. Only European and sole-Pasifika do not show this general pattern of results. The particular case of sole-Pasifika is considered in the next section.

Similar results have been observed in Australia, where taking a one-year break between high school and university was found to have a positive impact on students' tertiary academic performance, and this was also stronger for students on the lower-end of the marks distribution (Birch and Miller 2007). Their study however, did not include variables for school effects, socio-economic background, or ethnicity. Birch and Miller (2007) suggest that taking a gap year for travel or work appears to motivate students for study when they commence university. They also say that since it mostly benefits low-achieving students, there may be some merit in encouraging some students to take a break before starting tertiary studies, particularly if they are expected to have below-average performance, or are unsure of their future direction. This may be occurring already in some institutions. Fitzsimmons et al (2005) say that, for over thirty years, Harvard has recommended students take a gap year, proposing it in their letter of admission. They also suggest that Harvard's high overall graduation rate of 97 per cent is in part due to so many students taking time off before starting their tertiary study, although they present no evidence to support this. It may equally be due to highly selective admission criteria.

There is little other published work on the effects of taking a gap year, and what is available does not provide insights into the results found in the present study, particularly the differences found between and within ethnic groups. In the present study, only Māori, Asian and ever-Pasifika students show an improvement after taking a gap year, and then only for students from low-decile schools (figures 12 to 15).

One possibility is that these results reflect differences in motivation between gap-year students and others. This may be because returning students have a stronger desire to succeed. In other words, there is a possible selection effect, in that students who are *not* motivated, or feel as if they will not succeed, are far less likely to consider tertiary study after their year off. The proportion of students in that group who will pass most of their courses naturally increases.

Obviously any cohort of students will include unmotivated students. Lowe and Cook (2003) have shown that a substantial minority of students in Ireland start university for reasons other than academic or vocational ones, particularly students progressing directly to tertiary study after leaving school. These students, citing parental pressure, wanting a break, and enjoying themselves, would not necessarily be those returning if they had taken a gap year.

As was discussed in the last section, for students with lower school achievement, those results for students from low-decile schools are likely to under-estimate their actual academic ability, while for high-decile school students, their school achievement is likely to be over-stated relative to their 'true' ability. If it is self-selection that is responsible for the gap-year improvement, and only really motivated students return to study, then perhaps the differences seen between low and high-decile school gap-year students are simply because of this distortion in the relationship between achievement at school and in tertiary education. Assuming the same number of motivated students in the low and high-decile school groups for those returning after a gap year, the low decile group will, on average, include students with higher ability, and will then show corresponding higher levels of academic performance in their tertiary studies.

There may be other effects contributing to the difference between students from different schools. High-decile school students may over-estimate their abilities, basing it on their school results, or there may be greater parental or peer pressure for them to return to their studies. These students may also have fewer financial concerns, including less concern about borrowing money for their studies. The overall effect would be for more of the high-decile students to return after taking a gap year, motivated and non-motivated, lowering these students' overall success in their tertiary studies. These same reasons are also likely to contribute to there being fewer students from low-decile schools returning. In summary, the influences, motivations and pressures any particular student experiences in their decision to return to study are likely to

vary, which somewhat explains the differences in tertiary academic improvement after a gap year between students from different schools and family backgrounds.

This still leaves unresolved the reason why European and sole-Pasifika students from low-decile schools don't show better outcomes after taking a gap year, compared to similar students who do not take a gap year. It is not likely these groups are not as motivated as their peers. Clearly, other factors are involved. The case of Pasifika students generally is considered in the next section.

Are there particular reasons why Pasifika students' results are different from other ethnic groups?

This question arises because of the number of differences between Pasifika students, particularly sole-Pasifika, and others in this study. Overall, Pasifika ethnic group students show significant differences in academic performance within their ethnic group, while other groups do not (figure 9). Sole-Pasifika students from low-decile schools show the lowest levels of tertiary academic performance compared to other students (figure 10). Sole-Pasifika students from low-decile schools do not benefit from taking a gap year (figure 15). Sole-Pasifika students — apart from those from high-decile schools who did not take a gap year — have significantly lower levels of academic performance. This occurs across almost the entire range of achievement scores (figure 16). And lastly, for sole-Pasifika students from high-decile schools, taking a gap year *lowers* academic performance, while a gap year for nearly all other students improves academic performance, or at least is not detrimental to their educational outcomes (figure 16).

The study data contains no information as to why these results may be occurring. Clearly the causes need to be specific to the Pasifika ethnic group, and/or the sole-Pasifika group. More than one factor will undoubtedly be involved. The literature provides some suggestions, but no definitive answers.

Do Pasifika have a particular learning style that disadvantages them? Schoeffel and Meleisea (1994) have shown that Pasifika cultural values shape the way children of Pasifika migrants learn. They tend to be passive students, they record and memorise, and they tend to avoid classroom interaction. The authors suggest that the values of Pasifika families condition their children in ways which disadvantage them in contemporary educational and wider social contexts (Schoeffel and Meleisea 1994). In an Australian study, Lizzio et al (2002) found that how a student perceives their learning environment influences learning outcomes, over and above the effect of the student's academic performance at school. In particular, students who chose a reproducing or surface approach to learning (as opposed to one that entailed a deeper understanding of the material) achieved lower tertiary grades.

Are they particularly susceptible to parental pressure? Pasifika students have very high expectations on them to do well. Madjar et al (2009) found that all parents had high aspirations for their children, but especially Māori and Pasifika parents. Nash (2000) has shown that Pasifika students have extra-ordinarily high aspirations that bear little or no relationship to their scholastic achievements. In addition, they are subject to much family pressure to achieve scholastic success (Anae et al 2002, Franken et al 2008), and not just for themselves individually, but to bring status and honour to their extended families and the wider community (Madjar et al 2009). Incidentally, a similar finding has been found for Māori, where education is valued as both a personal gain and the development of the well-being of the community (Greenwood and Te Aika 2009). The pressure Pasifika (and other) parents place on their children to do well could be behind the mismatch between aspirations and ability as observed by Nash (2000). On the other hand, Chemers et al (2001) found that students who have higher expectations for academic performance show higher performance, although this would need to be commensurate with ability.

Attending a mid or high-decile school seems to improve sole-Pasifika students' performance in tertiary study—particularly if they are an above-average student—raising it to about the same level as other sole-ethnic groups, but only if they progress directly to tertiary study. The data shows that all minority ethnic groups benefit from taking a gap year, particularly students from low-decile schools, but for sole-Pasifika, a gap year seems to have no effect (for low-decile school students), and may be detrimental (for high-decile school students) to tertiary academic performance (figure 16). That attendance at a high-decile school is beneficial is reported by Ladd and Fiske (2001) for New Zealand students. They report that peer effects, and being associated with motivated and successful students, helps academic performance. Thrupp and Luton (2006) report that lower-attaining pupils benefit socially and educationally in these situations, with the proviso that the most disruptive pupils are absent. But why does this benefit not persist for sole-Pasifika students after taking a gap year? As discussed earlier, the gap-year improvement is likely to be due, at least in part, to self-selection, with more motivated and higher ability students returning, rather than the gap year itself imparting some additional benefit. If the hypothesis is correct, it suggests that, overall, a greater proportion of sole-Pasifika gap-year students return, including those who are less motivated.

Some evidence about how a gap year might affect students comes from a recent study in Auckland (Madjar et al 2010). That study found that the period between the end of school and the start of university, the 'summer months', were particularly challenging for Pasifika students. These students were encouraged by their parents to 'prepare for university', and were discouraged from any external activities, such as paid work, that might lure them away from the goal of university education. During this period, the students experienced self-doubt and loss of confidence, especially once they received NCEA results, which were worse than they had expected. By not engaging in practical activities that might have provided them with monetary resources, nor developing skills for life beyond secondary school, their inactivity contributed to feelings of boredom, de-motivation and a loss of commitment to the challenge of university life. Madjar et al were not considering a gap year *per se*, but these same factors could well influence students during a gap year, perhaps more so, given the longer time involved. Of course, these considerations may also apply to other students, but Madjar et al found that Pasifika students were particularly susceptible to this effect.

Are sole-Pasifika students more likely to be first-generation tertiary students? Students who are the first in their family to attend tertiary education are known to have specific difficulties (Inman and Mayes 1999). They found that compared to students whose parents or siblings attended tertiary institutions, first-generation students were often less-prepared academically and psychologically, and had lower high-school grades. They are also reported to have a lower sense of self-efficacy, and lower self-esteem. They also usually come from poorer families. Leach and Zepke (2005) found that children in families with experience in tertiary education were more likely to consider tertiary education, and were better able to cope with the enrolment process. However, Inman and Mayes found that first-generation tertiary students don't necessarily do worse in their studies.

Are family commitments greater for Pasifika students? Meyer et al (2009) found that academic performance at school was influenced by the child-care commitments of students, with performance suffering with almost any level of child-care responsibility. They found that Māori and Pasifika students, and students from low-decile schools, were more likely to be asked to care for siblings. Students stated that while this distraction from their studies was manageable during term time, during exam periods, the extra time commitment affected their ability to study and perform in the exams. This could also affect tertiary students, since it is unlikely that family expectations would change after leaving secondary school. Madjar et al (2010), in their Auckland study, also found that Pasifika students were more likely to be affected by family commitments, compared to other ethnic groups, and this was a source of stress in their studies.

Do institutional factors play a part in lower Pasifika¹⁸ educational achievement? There is little available literature on the experience of New Zealand students in this regard. While there is much evidence from overseas, particularly the US, we need to be wary of assuming those findings would apply in the New Zealand context. However, Tuuta et al (2004) reviewed a programme to change the attitudes of New Zealand school teachers to Māori students, and reported the effect that ‘deficit thinking’ had on student outcomes. Those findings may resonate to an extent with the US studies in a tertiary context. Black students who attended predominately white colleges in the US are reported to experience considerable adjustment difficulties, including isolation, alienation, and lack of support, over and above that experienced by all first-year students. The way a student perceives *and* [sic] responds to events in the tertiary setting shapes their tertiary outcomes (Allen 1992).

Contrasting the under-performance of Pasifika students in this study, mention must be made of Asian students. Asian students are often portrayed as a model minority because they achieve academic, social and economic success through hard work and adherence to Asian cultural norms (Ting 2000, Lee and Kumashiro 2005). In the present study, Asian students’ academic achievements are similar to European results. Scott (2008) also found New Zealand Asian students to be on a par with European students’ likelihood to pass all first year courses.

Asian students are also characterised as employing rote-learning, memorisation and passivity (Kennedy 2002). Kember (2000) however, found that for Asian students, the rote-learning style was not, in fact, incompatible with deep approaches to learning, and an intention to seek understanding. Kember also found they did not resist forms of teaching other than traditional didactic ones, but did need time and support to adapt to them. Kennedy (2002) concluded that Chinese learning styles are more subtle and complex than they appear to be in some (Western) misrepresentations of them.

Lee and Kumashiro (2005) also suggest that the model minority stereotype is unhelpful, since it hides the diverse and complex experiences of these students. It also diverts attention away from racial inequities faced by these groups. More damagingly, it influences perceptions, such that students who are able to live up to the stereotype standards are held up as examples for others to follow, and those unable to meet them are deemed failures or substandard for their ethnic group. It parallels the idea of ‘deficit thinking’ mentioned earlier.

Clearly, there are no simple conclusions to be drawn for Pasifika student’s educational underachievement. This under-achievement is likely to become a more important concern. Pasifika population numbers are projected to increase over the coming years, which, because of the age structure of this group, will increase the demand for bachelors-level study (Engler 2009).

Low student achievement

This study has shown low rates of first year academic performance at university for some students, as measured by the probability of passing most first-year courses. This is particularly the case for students who progress directly to tertiary study after leaving school, and who have below-average school achievement. Overall, 63 per cent of students with below-average school achievement, who did not take a gap year, pass most of their first year courses. This compares to 71 per cent when they took a gap year and about 90 per cent for students with above-average school achievement. The low school achievement group makes up 18 per cent of the study population, so this level of under-achievement affects a significant proportion of the student population.

¹⁸ And possibly also in other minority ethnic groups.

There is evidence that students have different motivations for attending university. Students from the University of Ulster were surveyed as to the importance of reasons for going to university (Lowe and Cook 2003). Most students agreed with statements relating to enhancing their academic and vocational prospects, but substantial minorities of students recognised parental pressure, enjoying themselves, and getting away from home as factors with which they identified. They also found that males were more likely to make reactive decisions, and students coming straight from school were also more likely to make choices for personal and social reasons rather than for vocational ones. So there may be some differences in the motivation for study of students between those that progress directly and those that take a gap year.

The situation may be exacerbated by the finding that students with below-average school achievement from high-decile schools may have school results which over-estimate the students' academic ability. Students from these schools make up the majority of the university first year intake, so any factor that depresses these students' academic performance will influence the overall outcome.

Are some students better prepared for study at university? Research has shown that students' own aspirations are vital for educational success (Thiessen 2007). Meyer et al (2006) linked motivation and aspirations (*Doing my best*, versus *Doing just enough*) with the amount of effort New Zealand students invested in gaining better results at school. Lack of motivation at school is reflected in lower achievement scores in NCEA. With a poor attitude to learning, even if the student reaches UE standard and progresses straight to university, a student may not have the right motivation and aspirations to succeed. It underscores the importance of the gap year as a circuit breaker, to reassess career aspirations and goals for some students, in particular those with ability whose school performance is depressed because of poor motivation or other factors.

What is clear is that many students are enrolling in university bachelors-degree courses with little chance of successfully completing their first year of study. This is in spite of these students all attaining NCEA level 3 and UE. It is also likely that most, if not all, of these students are capable of passing most of their courses. This study has shown that, under the right circumstances, students from any background, and any ethnic group, can show high levels of tertiary academic performance.

Geographic considerations

One factor not explored in this study is the geographic distribution of students with particular demographic characteristics. This study has shown that student performance can vary with ethnic group, so that disproportionate concentrations of particular ethnic groups in the regions may contribute to different outcomes for students in institutions across New Zealand.

Pasifika people predominately live in urban areas, and in the Auckland region in particular. The Asian ethnic group has a similar distribution to Pasifika, with two thirds of people of Asian ethnicity living in the Auckland region. Māori live mostly in the North Island (87 per cent), and are more evenly distributed across the North Island regions. The uneven distribution of Pasifika in particular has implications for Auckland institutions, given the low levels of tertiary achievement for sole-Pasifika found in this study.

This study also found interactions between ethnic group and school decile. The make-up of the student population from low-decile schools will vary by region. In the Auckland region, low-decile students will have a higher proportion of Pasifika and Māori students, compared to low-decile groups in other regions. These differences in the students' ethnic characteristics between the regions will have different impacts on institutions. Based on the results of this study, institutions with predominantly sole-European students in their low-decile school intake will

have better student performance statistics than institutions where low-decile schools students are non-European, and particularly if they are sole-Pasifika.

Whether a student relocated or not to study at university is also likely to affect an institution's student outcomes. A student may relocate because of personal choices, or because particular qualifications are not offered at local universities. Moving away from home involves sacrifices and costs not borne by students who do not have to relocate. A student needs motivation, commitment and financial resources, at least, to contemplate and undertake the relocation. Students who do relocate will therefore more likely be those with higher motivation, and being more motivated, as this study has found, will be more likely to succeed at university.

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