

Follow-Forward of Student Motivation and Achievement

A large number of students who were in Years 10 to 13 in 2005 had consented to participate in longitudinal research; in 2006-2008, additional students in Years 10 and 11 also consented to participation and were added to the longitudinal sample. Thus, for these students from 20 nationally representative schools, we have survey and NCEA achievement data for Year 11-13 students. These students were enrolled in Years 11, 12 and 13 in 2006 and in Years 12 and 13 in 2007 (the 2006 Year 13 students having finished school). In this final phase of the research, we have further monitored achievement for the 2005 Year 10 students who are expected to be in Year 13 in 2008 as well as students from 2006-2007 who have progressed through the senior school.

Follow-Along of Year 10-11 Students from 2005

Relationships between 2005 motivation and future achievement

Of those students who were in Years 10 in 2005 at the 20 schools in our sample, we were able to locate 1,531 students who were in Year 12 in the 2007 data, including 789 males and 742 females. Ninety-six percent were in Year 10 in 2005 and 4% reported they were Year 11 in 2005;⁵ they were Year 12 in 2007 when achievement was tracked. Sixty-three percent were European, 16% were Asian, 12% were Māori, 7% were Pacific, 2% were classified as Other. The majority of students (59%) were from middle decile schools, 32% were from high decile schools, and the remaining 9% were from low decile schools. Nearly all students were domestic students (97.5%); 2.5% were international students.

In 2008, we were able to locate 1,181 students from the 2005 sample. The majority had been in Year 10 during 2005 (96%): this is as expected, as most students in Year 11 or higher in 2005 would generally have left school by the end of 2007. At follow-up, 51% percent were female and 49% were male; 61% were European, 20% were Asian, 10% were Māori, 7% were Pacific, and 2% were designated as Other. Fifty-seven percent were in middle decile schools, 36% were in high decile schools, and the remaining 8% were in low decile schools.

Table 2 shows the relationships between Year 10 student self reports on those motivation orientations shown in previous reports to be significantly related to achievement—*Doing My Best* and *Doing Just Enough*.

⁵ The small number of Year 11 students in this sample were enrolled in one or more Year 10 classes, hence, are part of this survey group.

Table 2: The relationships between Year 10 motivation in 2005 and Year 12 achievement in 2007

	<i>Doing My Best</i>	<i>Doing Just Enough</i>
Total credits	.23*	-.31*
Total unit standard credits	-.21	.25*
Internal – A	-.01	.01
Internal – M	.13*	-.19*
Internal – E	.22*	-.29*
External – N	-.02	.08
External – A	.20*	-.22*
External – M	.24*	-.27*
External – E	.15*	-.16*

Note: * = $p < .001$. Sample sizes differ across achievement measures. A

For these students, the *Doing My Best* orientation in 2005 is significantly related to more total credits, internal standards with Excellence and externally assessed standards at all levels of achievement in 2007. The *Doing Just Enough* orientation is significantly related to fewer total credits, internal standards with Excellence, and externally assessed standards at all levels; *Doing Just Enough* also is significantly related to higher total unit standard credits.

We also followed forward students who had reported their motivation orientations in 2005 as Year 11 students to assess whether their motivation orientations predicted their achievement two years later, in 2007. This sample consisted of 1231 students, 602 males and 626 females; three students did not report their gender. Almost all students were Year 11 in 2005 (94%). Thus the majority of students would have been Year 13 in 2007 when achievement was tracked. Fifty-four percent were European, 23% were Asian, 8% were Māori, 9% were Pacific, 5% were classified as Other, and the remaining 1% did not have a specified ethnicity. The majority of students (62%) were from middle decile schools, 32% were from high decile schools, and the remaining 6% were from low decile schools. Nearly all students were domestic students 96.5%; 3.5% were international students.

Again, we found relationships between motivation orientations in 2005 and student achievement in 2007. Table 3 shows that *Doing My Best* in 2005 was generally associated with higher achievement two years later, and *Doing Just Enough* was generally associated with lower achievement across two years.

Table 3: The relationships between Year 11 motivation in 2005 and Year 13 achievement in 2007

	<i>Doing My Best</i>	<i>Doing Just Enough</i>
Total Credits	.34*	-.33*
Total US Credits	-.09	.12*
Internal – A	-.05	-.04
Internal – M	.27*	-.31*
Internal – E	.34*	-.32*
External – N	.06	-.05
External – A	.35*	-.34*
External – M	.39*	-.36*
External – E	.24	-.21*

Note: * = $p < .001$. Sample sizes differ across achievement measures.

Students were followed in 2008 to investigate relationships between motivation in year 10 and achievement in year 13. Table 4 shows that the motivation orientation *Doing My Best* in year 10 was associated with more total credits, more external achieved standards and fewer unit standards credits. The motivation orientation *Doing Just Enough* was associated with fewer total credits, fewer internal and excellence credits and more unit standards credits.

Table 4: The relationships between Year 10 motivation in 2005 and Year 13 achievement in 2008

	<i>Doing My Best</i>	<i>Doing Just Enough</i>
Total credits	.17*	-.28*
Total unit standard credits	-.12*	.17*
Internal – N	-.09	.11
Internal – A	-.01	.03
Internal – M	.01	-.08
Internal – E	.12	-.22*
External – N	.05	.05
External – A	.15*	-.22*
External – M	.11	-.23*
External – E	.04	-.19*

Note: * = $p < .001$. .Sample sizes differ across achievement measures.

Multiple regression was also used to explore the interrelationships between motivation and achievement based on the 2005 to 2007 data. Multiple regression was used rather than correlation because we wanted to control for previous achievement. In particular, hierarchical multiple regression enables the effect of prior achievement on later achievement to be controlled first, after which the unique effect of motivation on later achievement is assessed. The number of total credits was the criterion variable and *Doing My Best* and *Doing Just Enough* were the predictor variables. Hierarchical regression was used to examine whether motivation could account for later achievement over and above what could be accounted for by prior achievement. Results showed that the first step of the regression—prior achievement—significantly predicted achievement two years later, $\beta = .12$, $p < .001$. Total credits achieved in 2005 accounted for 1% of the variance in total credits during 2007. This low relationship is likely to reflect the attrition in the sample over the two years where students did not stay in school to complete years 12 and 13. The second step of the regression—motivation orientation—showed that both *Doing My Best*, $\beta = .27$, $p < .001$ and *Doing Just Enough*, $\beta = -.26$, $p < .001$ significantly predicted higher and lower total credits respectively. Motivation orientations during 2005 accounted for 15% of the variance in total credits during 2007. Therefore, motivation orientations in 2005 predicted the number of credits achieved in 2007 over and above predictions based only on the number of credits students achieved in 2005.

Similar results were found when predicting achievement across the 2006 to 2008 school years. For this analysis, the first step of the regression—achievement in 2006—significantly predicted achievement in 2008, $\beta = .18$, $p < .001$. This first step accounted for 3% of the variance in achievement during 2008. The second step of the regression—*Doing My Best* and *Doing Just Enough* in 2006—revealed that both motivation orientations significantly predicted achievement two years later ($\beta = .29$, $p < .001$ and $\beta = -.25$, $p < .001$ respectively). This second step of the regression explained 20% of the variance in achievement during 2008.

Motivation and Achievement Patterns for Senior Students

Relationship between 2006 motivation and 2007 achievement

In 2006, we had administered the survey to a new sample of students in Years 10 and 11. Of those students who were in Years 10-11 in 2006, we were able to locate 3227 students in the 2007 New Zealand Qualifications Authority (NZQA) data, including 1696 males and 1530 females; one student did not indicate gender. Of this sample 47% were Year 10 in 2006, and 53% were Year 11 in 2006. Sixty-six and a half percent were European, 12.5% were Asian, 10% were Māori, 8% were Pasifika and 3% were classified as Other. The majority of students (63%) were from middle decile schools, 29% were from high decile schools, and the remaining 8% were from low decile schools. Nearly all were domestic students (97%); 3% were international students.

From the 2006 sample, we able to locate 2,113 students in 2008, including 1,134 males and 978 females; one student did not indicate gender. Of these students, 63% had been in Year 10 and 37% in Year 11 during 2006. Sixty-seven percent were European, 13% were Asian, 9% were Pacific, 8% were Māori, and 3% were designated as Other. Sixty-four percent were in middle decile schools, 29% were in high decile schools, and 7% were in low decile schools.

Table 5 shows the correlations between student motivation reported by junior students in 2006 and their achievement in 2007. Again, the two motivation orientations in 2006 are significantly associated with student achievement one year later. Specifically, *Doing My Best* is most strongly associated with a higher number of total credits, internal credits with Excellence, and external credits with Merit. *Doing Just Enough* is most strongly associated with fewer total credits, internal credits with Excellence, and external credits with Merit.

Table 5: The relationships between motivation in 2006 and achievement in 2007

	<i>Doing My Best</i>	<i>Doing Just Enough</i>
Total Credits	.43*	-.39*
Total US Credits	-.20*	.22*
Internal – A	.01	.02
Internal – M	.25*	-.26*
Internal – E	.36*	-.34*
External – N	-.05	.12*
External – A	.26*	-.24*
External – M	.34*	-.34*
External – E	.27*	-.24*

Note: * = $p < .001$. Sample sizes differ across achievement measures.

Longitudinal patterns of motivation orientation—does motivation change across time?

In our 2007 report (Meyer, Weir et al., 2007) we reported that student motivation towards *Doing Just Enough* and *Doing My Best* was relatively stable across one year ($r > .50$, $p < .001$ in both cases). The research reported here replicates these findings in showing that the correlation between *Doing My Best* across 2006 and 2007 was strong (Cohen, 1992) ($r = .58$, $p < .001$), as was the correlation between *Doing Just Enough* across these two years ($r = .54$, $p < .001$). Similarly, the

correlation between *Doing My Best* across 2007 and 2008 was strong ($r = .65, p < .001$), as was the correlation between *Doing Just Enough* across these two years ($r = .62, p < .001$).

While these data reflect a general trend in motivation orientations, overall patterns may mask important individual fluctuations in motivation across time. To explore these fluctuations in motivation, we constructed motivation categories to investigate the magnitude of motivational changes upward or downward by individual students and whether shifts were accompanied by changes in achievement as well.

Categories were constructed based on a summative score comprising *Doing My Best* and *Doing Just Enough* factor scores to create a “motivation total score”⁶ for each year. Possible total scores range between 4 and 32, with higher scores reflecting a more adaptive motivation orientation. Thus we treated *Doing My Best* and *Doing Just Enough* as different subscales of an overall motivation scale. This scale was internally reliable for both 2006 ($\alpha = .78$) and 2007 ($\alpha = .82$) data. Similar overall group mean scores were evident during both 2006 ($M = 23.01, S.D. = 4.56$) and 2007 ($M = 23.32, S.D. = 4.97$) on this new scale.

As part of an exploratory approach to develop a practical measure which teachers could use, we created six motivation category groups by identifying the five cut points that would split the distribution into roughly equal sample sizes. The cut points were created using student responses from 2006. This approach allowed us to explore student movement across the categories from year to year, either up or down; a simple check following these procedures could potentially be applied by teachers following interventions designed to motivate students. Table 6 shows the number of students in each motivation category and each group’s respective mean score on the motivation measure for both the 2006 and 2007 sample.

Table 6: Six motivation categories comprising composite *Doing My Best* and *Doing Just Enough*^a

Categories	1	2	3	4	5	6
Total score ranges	<19	19-20	21-22	23-24	25-27	>28
N 2006	780	524	575	534	596	474
N 2007	870	575	516	500	693	702
<i>M</i> (<i>S.D.</i>) 2006	16.81 (2.19)	20.49 (.51)	22.47 (.51)	24.49 (.51)	26.91 (.84)	30.07 (1.02)
<i>M</i> (<i>S.D.</i>) 2007	16.57 (2.44)	20.48 (.51)	22.46 (.50)	24.50 (.50)	26.94 (.82)	30.25 (1.08)
<i>M</i> / 8 2006	2.10	2.56	2.81	3.06	3.36	3.76
<i>M</i> / 8 2007	2.07	2.56	2.81	3.06	3.37	3.78

^a Category 1 represents the lowest motivation orientation total score, with each of the six categories including approximately one-sixth of students up to Category 6 representing the highest motivation orientation total score.

⁶ Responses on *Doing Just Enough* were reverse scored prior to summing the motivation total score.

What is the relationship between motivation categories and achievement?

We used Analysis of Variance (ANOVA) tests to investigate if there were differences between two or more of these six categories of low to high motivation groups (e.g., between the 6 category groups) for given outcome variables (e.g., motivation). ANOVA results reveal whether or not there are significant differences between the groups overall and then, where the ANOVA shows significant differences, we followed up with Bonferroni tests to explore which groups are significantly different from one another. For this series of ANOVAs, there is only one independent variable which is the group category, so there are no interactions to discuss.

Results from the ANOVA showed that students from different motivation categories in 2006 achieved significantly differently in terms of total credits achieved in 2006, $F(5, 1920) = 48.95$, $p < .001$, partial $\eta^2 = .11$ (Figure 2). The follow-up post hoc tests with Bonferroni corrections⁷ showed that only motivation categories 3 and 4 and categories 5 and 6 were not significantly different from one another in total credits attained.

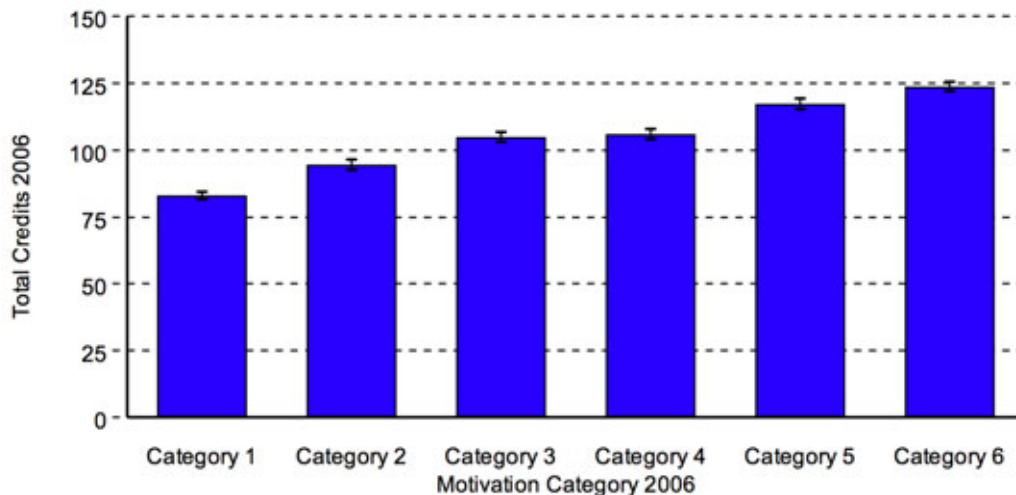


Figure 2:
Number of total credits achieved in 2006 by students in the six motivation categories

Students from different motivation categories in 2007 also achieved significantly different results, in terms of total credits achieved in 2007, $F(5, 1741) = 72.17$, $p < .001$, partial $\eta^2 = .17$ (Figure 3). Follow-up post hoc tests showed that all motivation categories scored significantly different results (at $p < .05$) except groups 2, 3 and 4.

⁷ Standard significance levels were used here because Bonferroni corrections account for the number of comparisons, thus adjust the level of significance. All post hoc tests to follow also use Bonferroni corrections.

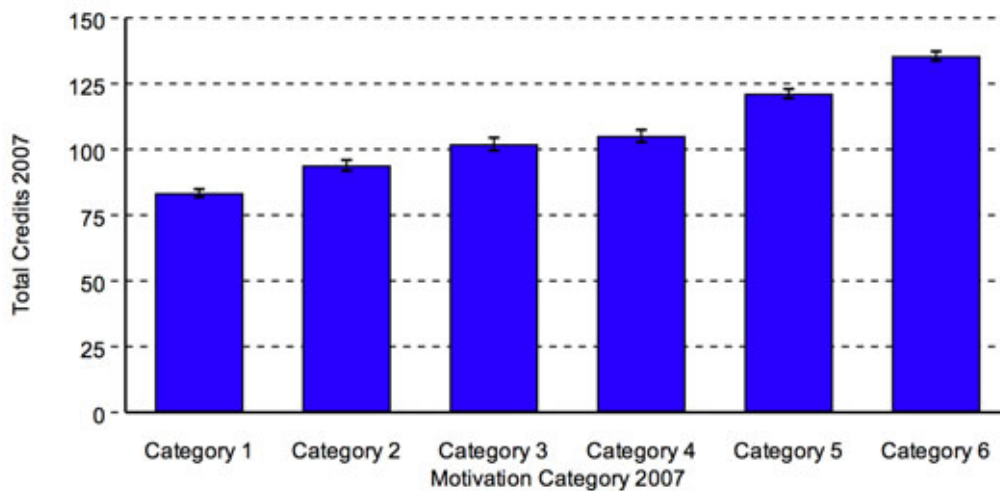


Figure 3:
Number of total credits achieved in 2007 by students in the six motivation categories

How does motivation change over time?

Across 2006 and 2007 there were 811 students for whom we assessed motivation at both points in time, thus allowing us to assess the number of students who increased or decreased their motivation across the two years. Approximately a third of the sample (36%) did not move categories between 2006 and 2007 while approximately two-thirds of the student sample either increased or decreased their motivation to achieve. Approximately a third of the sample (36%) moved up or down one motivation category, 19.5% percent moved up or down two categories, 7% moved up or down three categories, and the remaining 1.5% moved up or down four or five categories. These changes are shown in Table 7 (percentages) and Table 8 (numbers of students).

Table 7: Percentage of students who changed motivation category between 2006 and 2007, for each motivation category

Group	Movement										
	-5	-4	-3	-2	-1	0	1	2	3	4	5
1						56	18.5	12	8	4.5	1
2					40	25	17	9	9	0	
3				23	14	16	18.5	20.5	8		
4			9.5	15.5	15	19.5	26	14.5			
5		3.5	4	11	12	37	32.5				
6	2	2	1	3	18	74					

Table 8: Numbers of students who changed motivation category between 2006 and 2007, for each motivation category

Group	Movement										
	-5	-4	-3	-2	-1	0	1	2	3	4	5
1						64	21	14	9	5	1
2					45	28	19	10	10	0	
3				33	20	23	26	29	11		
4			15	25	24	31	42	23			
5		6	7	19	20	63	56				
6	2	2	1	4	20	83					

How are changes in motivation related to achievement?

First, we compared those who stayed in the same motivation category against those who increased or decreased motivation on the number of credits achieved during 2007 (Figure 4).

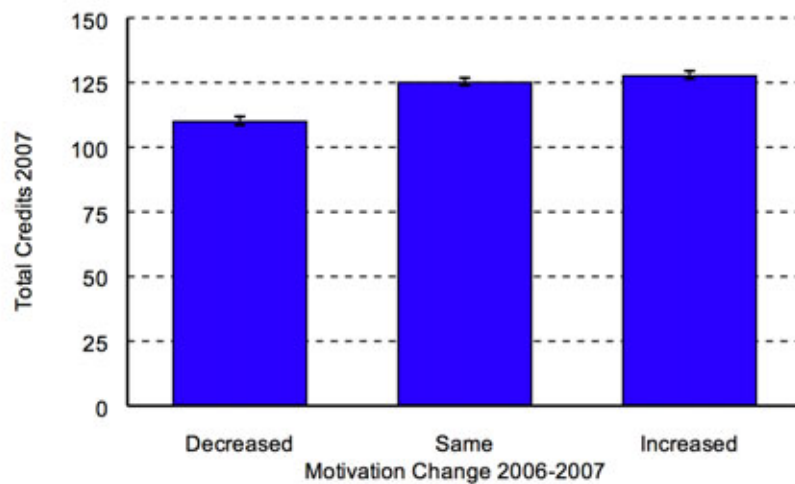


Figure 4:
Total credits attained by students as a function of motivation change

ANOVA results showed that students achieved at different levels depending on whether they increased, decreased or reported the same level of motivation. Specifically, a main effect was evident for motivation category, $F(2, 808) = 20.61, p < .001$, partial $\eta^2 = .05$). Post hoc tests showed that those who stayed the same or reported higher levels of motivation achieved more total credits in 2007 compared with those who reported a decrease in motivation. There was no statistical difference between those whose motivation stayed the same and those whose motivation increased.

One hundred and twelve students moved up 2 or more categories, and 114 students moved down 2 or more categories. We explored whether or not those who moved up 2 or more categories achieved more total credits than those who moved down 2 or more categories. ANOVA results showed that those whose motivation increased by 2 or more categories achieved significantly more total credits ($M = 124.68, S.D. = 30.37$) than those whose motivation decreased by two or more categories ($M = 105.34, S.D. = 35.22; F(1, 224) = 19.51, p < .001$, partial $\eta^2 = .08$).

Thirty-six students moved up 3 or more categories, and 33 students moved down 3 or more categories. We explored whether or not those who moved up 3 or more categories achieved more total credits than those who moved down 3 or more categories. ANOVA results showed that those whose motivation increased by 3 or more categories achieved significantly more total credits ($M = 123.78$, $S.D. = 25.94$) than those whose motivation decreased by three or more categories ($M = 105.94$, $S.D. = 24.04$; $F(1, 67) = 8.73$, $p < .01$, partial $\eta^2 = .12$).

An equal number of males and females (57 and 57 respectively) moved down two or more categories. The majority of those who moved down two or more categories were European (69%), 4% were Asian, 14% were Māori, 7% were Pacific, and 6% classified their ethnicity as Other. Most were from middle decile schools (63%), 14% were from low decile schools, and 23% were from high decile schools. These proportions are similar to our sample demographics.

Slightly more males than females (60 and 52 respectively) moved up two or more categories. The majority of those who moved up 2 or more categories were European (64%), 23% were Asian, 5% were Māori, 6% were Pacific, and 1% classified their ethnicity as Other. Most were from middle decile schools (62.5%), 9% were from low decile schools, and 28.5% were from high decile schools.

Similar numbers of males and females (15 and 18 respectively) moved down three or more categories. The majority of those who moved down three or more categories were European (82%), 3% were Asian, 6% were Māori, 3% were Pacific, and 6% classified their ethnicity as Other. Most were from middle decile schools (67%), 9% were from low decile schools, and 24% were from high decile schools.

More males than females (22 and 14 respectively) moved up three or more categories. The majority of those who moved up three or more categories were European (66.5%), 27.5% were Asian, 3% were Māori, 3% were Pacific, and none classified their ethnicity as Other. Most were from middle decile schools (67%), 8% were from low decile schools, and 25% were from high decile schools.

What is the relationship between motivation categories and achievement during 2005?

ANOVA was also used to explore whether students from higher motivation categories scored more total credits in 2005 than those from lower motivation categories. Figure 5 shows the results of analyses of average total credits attained by students in each of the six motivation categories in 2005, 2006 and 2007. Results for 2005 showed that there was a significant relationship between motivation category and total credits achieved, $F(5, 3563) = 230.68$, $p < .001$, partial $\eta^2 = .25$ (Figure 5). Post hoc tests showed that all groups scored significantly differently from each other.

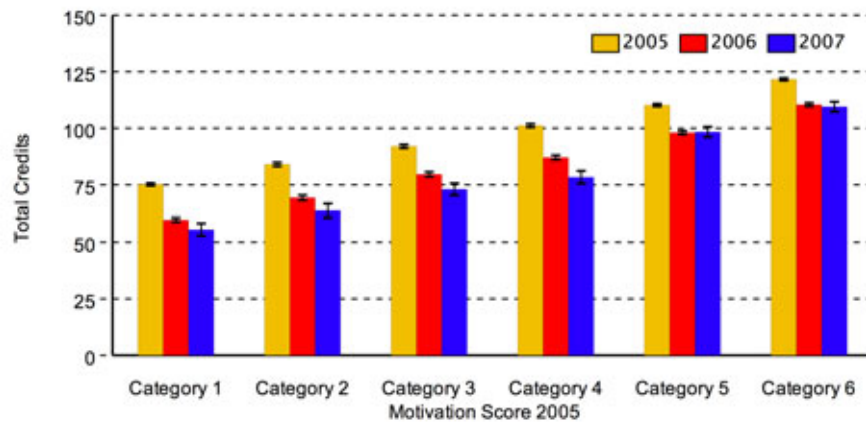


Figure 5: Credits attained by students in different motivation categories

In addition to examining total credits, we explored the total number of Merit and Excellence credits achieved during 2005 in relationship to motivation categories. Results for 2005 showed that those from higher motivation categories scored significantly more Merit credits than those from lower motivation categories, $F(5, 3563) = 346.60, p < .001, \text{partial } \eta^2 = .33$ (Figure 6). Post hoc tests showed all groups scored significantly differently from each other.

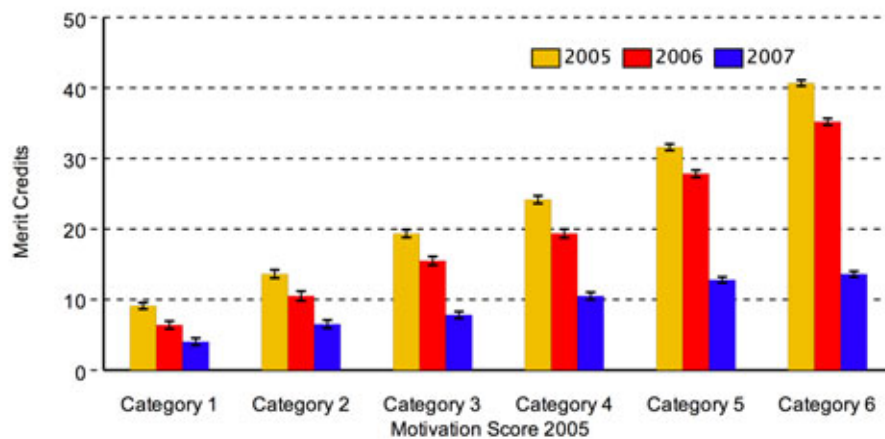


Figure 6: Merit credits attained by students in different motivation categories

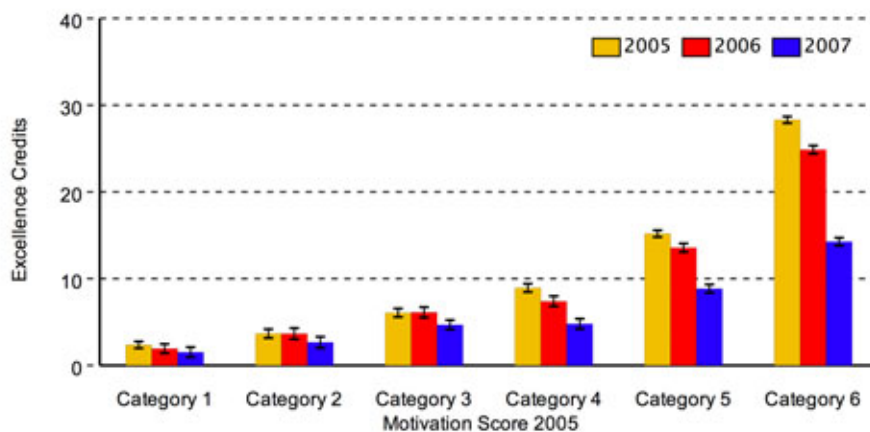


Figure 7: Excellence credits attained by students in different motivation categories.

Regarding Excellence credits, results showed that those from the highest motivation category scored significantly more Excellence credits during 2005 than students from all other motivation categories, $F(5, 3563) = 329.40, p < .001, \text{partial } \eta^2 = .32$ (Figure 7). Post hoc tests showed that students from motivation categories 5 and 6 achieved significantly more Excellence credits than students from all other motivation categories. Students from motivation category 6 also showed significantly more Excellence credits than those from motivation category 5.

What is the relationship between motivation categories and achievement one-two years later in 2006-2007?

We also explored whether students in the higher motivation categories in 2005 continued to achieve more total credits one year later in 2006 and two years later in 2007. These data are also displayed in Figure 5. Results showed that students from higher motivation categories during 2005 achieved significantly more total credits the next year in 2006, compared with students who were in lower categories, $F(5, 2535) = 184.48, p < .001, \text{partial } \eta^2 = .27$. Post hoc tests showed that all groups scored significantly differently from each other. Those from higher motivation categories continued to achieve more total credits two years later during 2007. Results showed that students who were from higher motivation categories during 2005 still achieved significantly more total credits two years later in 2007, $F(5, 1225) = 47.82, p < .001, \text{partial } \eta^2 = .16$. Post hoc tests showed that students from motivation categories 5 and 6 did not achieve a significantly different number of total credits, but both groups achieved more credits than students from all other motivation categories.

In addition to looking at total credits, we tested whether students from higher motivation categories in 2005 attained more Merit and Excellence credits during 2006-2007. Merit and Excellence credits were examined by considering internal and external results separately. Regarding internal Merit credits, those who were in a higher motivation category in 2005 achieved more internal Merit credits during 2007, $F(5, 1225) = 33.55, p < .001, \text{partial } \eta^2 = .12$. Post hoc tests showed that students who were in the highest motivation category achieved significantly more Merit credits than all other categories, except for category 5. Results showed that those from higher motivation categories achieved significantly more Merit credits than those from lower achievement categories, $F(5, 2535) = 237.92, p < .001, \text{partial } \eta^2 = .32$. Post hoc tests show that all groups scored significantly differently from each other.

Similarly, results showed that those from higher motivation categories also achieved significantly more Excellence credits during 2006, compared to those from lower motivation categories, $F(5, 2535) = 17.60, 8, p < .001, \text{partial } \eta^2 = .26$. Post hoc tests showed that students from motivation categories 5 and 6 achieved significantly more Excellence credits than students from all other motivation categories. Students from category 6 also achieved significantly more Excellence credits than those from motivation category 5.

Regarding internal Excellence credits, those who were in a higher motivation category in 2005 achieved more internal Excellence credits in 2007, $F(5, 1225) = 53.00, p < .001, \text{partial } \eta^2 = .18$. Post hoc tests showed that students who were in the two highest motivation categories achieved significantly more Excellence credits than students from all other categories. In addition, those in motivation category 6 scored significantly more internal Excellence credits than those in category 5.

Achievement trends by term or quarter year

We examined the trend of 2005 achievement across terms for students from different motivation categories, focusing on Merit and Excellence credits.⁸ Results for Merit credits showed that there was a significant effect for Quarter 2, $F(5, 3563) = 56.82, p < .001$, partial $\eta^2 = .07$, Quarter 3, $F(5, 3563) = 48.44, p < .001$, partial $\eta^2 = .06$, and Quarter 4, $F(5, 3563) = 353.17, p < .001$, partial $\eta^2 = .33$. Notably, the largest effect was seen during the final quarter of the year. Post hoc tests showed that during Quarter 4, students from motivation categories 5 and 6 achieved significantly more Merit credits than those from the other groups. Students from motivation category 6 also scored significantly more credits than students from category 5 (see Figure 8).

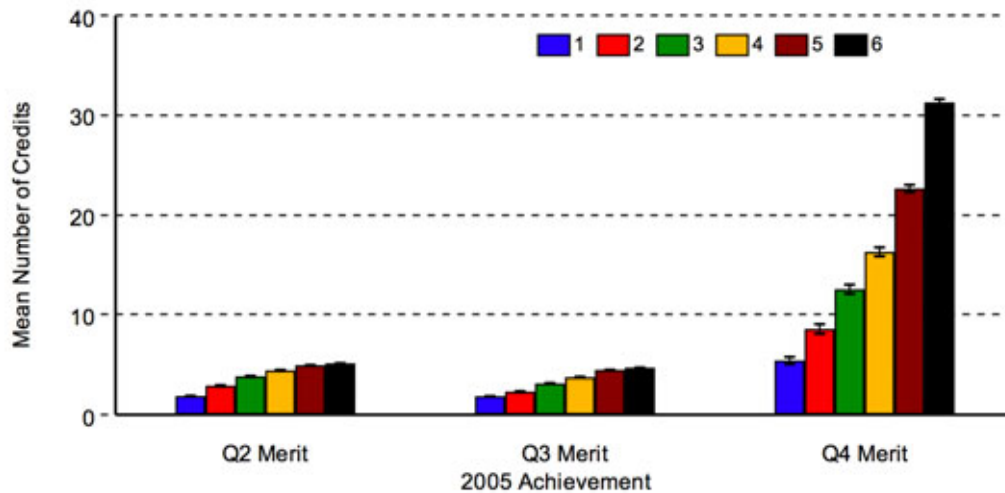


Figure 8: Merit credits attained by quarter by motivation category

Regarding Excellence credits, there was a significant effect for Quarter 2, $F(5, 3563) = 166.31, p < .001$, partial $\eta^2 = .09$, Quarter 3, $F(5, 3563) = 150.59, p < .001$, partial $\eta^2 = .17$, and Quarter 4, $F(5, 3563) = 252.55, p < .001$, partial $\eta^2 = .26$. The size of these effects was larger for Excellence credits than Merit credits. Post hoc tests showed that during each quarter students from motivation categories 5 and 6 achieved significantly more Excellence credits than those from all other groups. Students from motivation category 6 also scored significantly more credits than students from category 5 (see Figure 9).

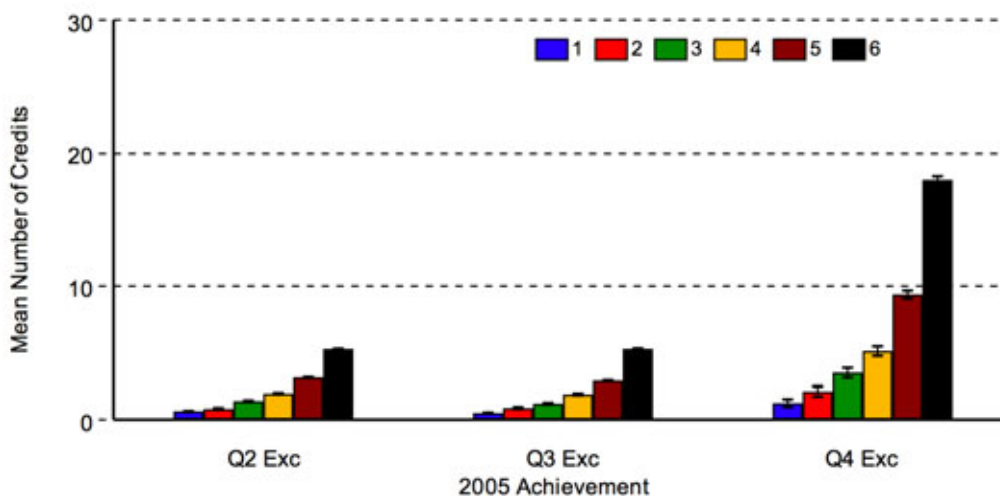


Figure 9: Excellence credits attained by quarter by motivation category

⁸ Please note that external credits for Merit and Excellence were only available for 2007.

Further, we explored the trend of 2006 achievement across terms for students from different motivation categories, with a focus on Merit and Excellence credits.⁹ We used Multiple Analysis of Variance (MANOVA) which examines whether there is a difference between two or more groups (e.g., between the 6 categories) on two or more outcome variables (e.g., credits attained each quarter). We did not use repeated measures MANOVAs because a substantial number of students did not have information about credit attainment in every quarter (i.e., we were unable to track individual students across the year). The MANOVA was performed to explore the pattern of achievement for each motivation category (measured during 2005) for Merit credits across each quarter of 2006.¹⁰ There was a significant effect for Quarter 2, $F(5, 2527) = 34.52, p < .001, \text{partial } \eta^2 = .06$, Quarter 3, $F(5, 2527) = 58.64, p < .001, \text{partial } \eta^2 = .10$, and Quarter 4, $F(5, 2527) = 182.53, p < .001, \text{partial } \eta^2 = .27$. Notably, the largest effect was seen during the final quarter of the year. Post hoc tests showed that during Quarter 4 students from motivation categories 5 and 6 scored significantly more Merit credits than those from the all other motivation categories. Students from motivation category 6 also achieved significantly more Merit credits than students from category 5 (see Figure 10).

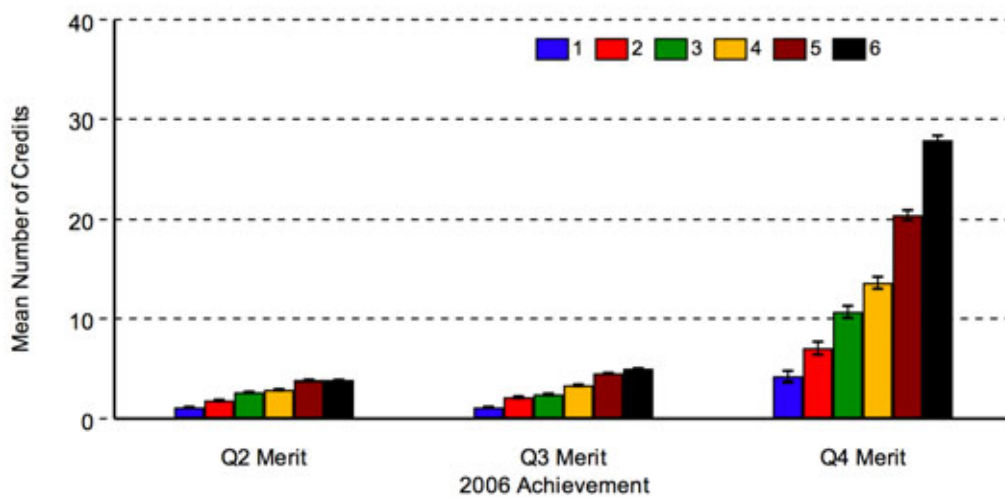


Figure 10: Merit credits attained by quarter one year later by students in different motivation categories

A MANOVA was also performed to explore the pattern of achievement for each motivation category for Excellence credits across each quarter of 2006.¹¹ There was a significant effect for Quarter 2, $F(5, 2527) = 83.44, p < .001, \text{partial } \eta^2 = .14$, Quarter 3, $F(5, 2527) = 91.64, p < .001, \text{partial } \eta^2 = .15$, and Quarter 4, $F(5, 2527) = 114.09, p < .001, \text{partial } \eta^2 = .18$. Post hoc tests showed that during each quarter, students from motivation categories 5 and 6 achieved significantly more Excellence credits than those from each other motivation category. Students from motivation category 6 also achieved significantly more Excellence credits than students from category 5 (see Figure 11).

⁹ Note that external credits for Merit and Excellence were only available for 2007.

¹⁰ Quarter 1 was not included due to the small number of credits reported by schools.

¹¹ Quarter 1 was not included due to small numbers of credits reported by schools.

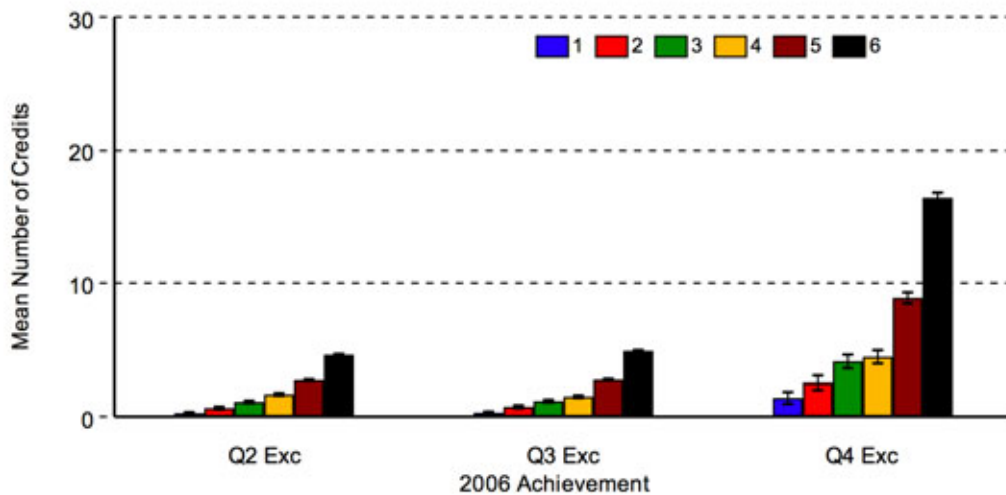


Figure 11: Excellence credits attained by quarter one year later by students in different motivation categories

We also explored the trend of 2007 achievement across terms for students from different motivation categories, focusing on Merit and Excellence credits. First, a MANOVA was performed to explore the pattern of achievement for each motivation category for Merit credits across each quarter. There was a significant effect for Quarter 2, $F(5, 1225) = 11.03, p < .001, \text{partial } \eta^2 = .04$, Quarter 3, $F(5, 1225) = 15.34, p < .001, \text{partial } \eta^2 = .06$, Quarter 4, $F(5, 1225) = 76.31, p < .001, \text{partial } \eta^2 = .24$, and externally achieved Merit credits, $F(5, 1225) = 67.64, p < .001, \text{partial } \eta^2 = .22$ (Figure 12). Notably, the largest effect was seen towards the end of the year for Quarter 4 and external credit. Post hoc tests showed that during Quarter 4 and external exams, students who were in the two highest motivation categories achieved significantly more Merit credits than all other categories. In addition those who were in motivation category 6 scored significantly more Merit credits than those in category 5.

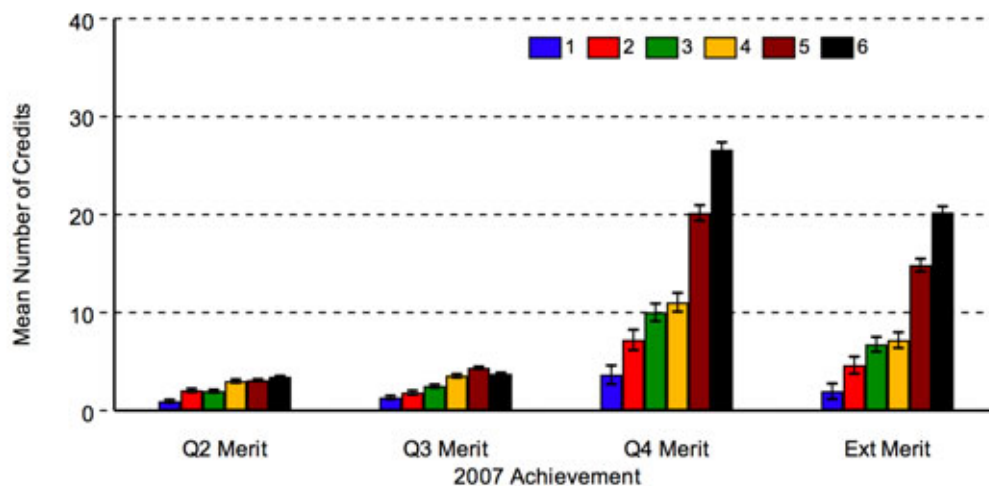


Figure 12: External Merit credits attained across quarters two years later by students in different motivation categories

Regarding the pattern of achievement for Excellence credits, there was a significant effect for Quarter 2, $F(5, 1225) = 26.96, p < .001, \text{partial } \eta^2 = .10$, Quarter 3, $F(5, 1225) = 32.91, p < .001, \text{partial } \eta^2 = .12$, Quarter 4, $F(5, 1225) = 36.21, p < .001, \text{partial } \eta^2 = .13$, and externally achieved Excellence credits, $F(5, 1225) = 25.99, p <$

.001, partial $\eta^2 = .10$ (Figure 13). Post hoc tests showed that students who were in the highest two motivation categories achieved significantly more external Excellence credits than all other categories. Those in the highest category also scored significantly more external Excellence credits than those from category 5.

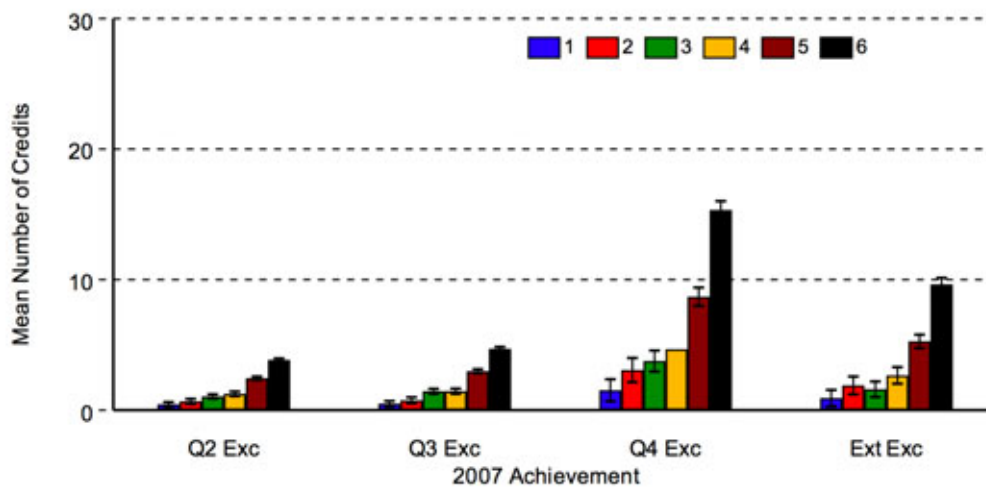


Figure 13: External Excellence credits attained across quarters two years later by students in different motivation categories

Motivation and Achievement Patterns for Junior Students

Survey responses Year 10 and 11 students 2007

In addition to following forward students who completed the motivation orientation survey during 2005 and 2006, the motivation orientation measure was also administered to Year 10 and 11 students during 2007. Items from the longer survey that related most strongly to achievement formed the core of a shorter motivation screening instrument (see also Meyer et al., 2007). Hence, we are able to continue assessing the relationship between student motivation and achievement using a new cohort of students, and these data are summarised in the next chapter. Here we summarise the results of added items to assess the influences of teachers, parents, and peers as well as other activities (part-time work, sport, child care, etc) on motivation and achievement.

Student sample collected in 2007

Student surveys were administered to the same 20 schools used in our previous work. Data were returned by all but one school. In total, 3,934 student surveys were collected (1,878 were Year 10 students, 2,017 were Year 11 students, and 39 students did not provide information on their year at school). Of this group there were 2,025 males, 1,886 females and 23 students who did not provide information on their gender.

Seventy-eight of these students (2%) completed less than 95% of the survey and thus were deleted from the sample, leaving 3,856 students in the final sample. This final sample consisted of 1,994 males and 1,849 females—13 students did not provide information on their gender. Of these, 1,846 were Year 10 students, 1,983 were Year 11 students and 27 students did not provide information on their year at school. Roughly half of our sample was in middle decile schools (52%),

15% in low decile schools and 33% in high decile schools. Ethnicity data were obtained from NZQA for 1,754 of these students who were predominantly in Year 11 or in Year 10 (enrolled early) in NCEA Level 1. Of the ethnicity information available, 62% were European, 13.5% were Asian, 11% were Māori, 9.5% were Pacific, and 4% classified their ethnicity as Other.

Student sample collected in 2008

Student surveys were administered to the same 20 schools and surveys were returned by all but 1 school. In total, 5,430 student surveys were collected (2,926 were Year 10 students, 2,461 were year 11 students, and 43 did not provide information about their year at school). Of this group there were 2,633 males, 2,781 females, and 16 who did not provide information on their gender.

Sixty-one of these students (1%) completed less than 95% of the survey and thus were deleted from the sample, leaving 5,369 students in the final sample. This final sample consisted of 2,600 males and 2,757 females—12 students did not provide information on their gender. Of these, 2,903 were Year 10 students, 2,429 were Year 11 students and 37 students did not provide information on their year at school. Half of our sample was in middle decile schools, 8% in low decile schools and 42% in high decile schools. Ethnicity data were obtained from NZQA for 2,617 of these students who were predominantly in Year 11 or in Year 10 (enrolled early) in NCEA Level 1. Of the ethnicity information available, 57% were European, 19% were Asian, 11% were Māori, 7% were Pacific, and 6% gave their ethnicity as Other.

Are there patterns of motivation orientation by ethnicity?

A MANOVA was conducted to explore whether the *Doing My Best* and *Doing Just Enough* motives varied across students of different ethnicity. In this case, the MANOVA measures whether or not there are significant differences between students in each ethnic group on the two outcome variables of *Doing My Best* and *Doing Just Enough*. There was a significant difference between subjects effect of ethnicity on *Doing My Best*, $F(3, 1678) = 38.22, p < .001$, partial $\eta^2 = .06$, and *Doing Just Enough*, $F(3, 1678) = 40.78, p < .001$, partial $\eta^2 = .07$. Figure 14 displays the levels of *Doing Just Enough* and *Doing My Best* across ethnicities. Post hoc tests showed that all differences were significant ($p < .05$), with one exception: the difference between Māori and Pacific students on *Doing Just Enough* was not significant.

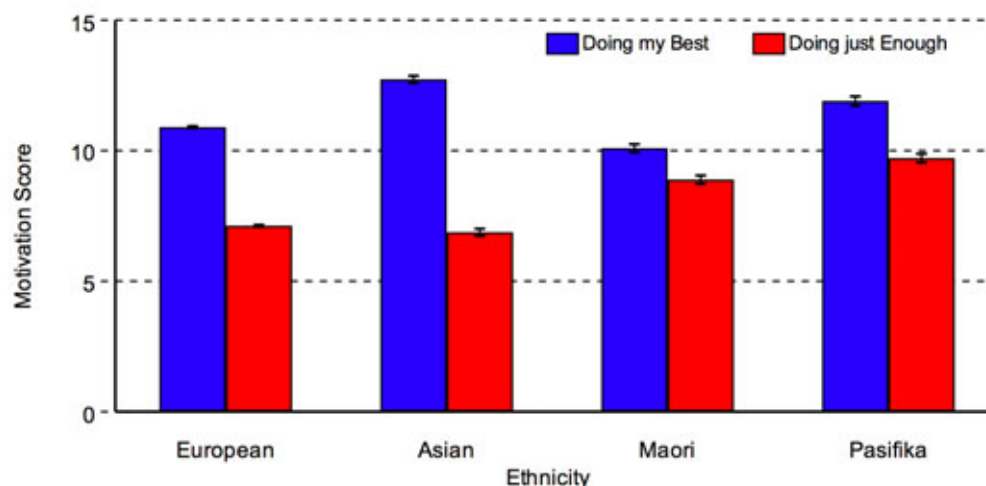


Figure 14: Ethnic patterns in motivation orientations

Are there gender differences in Doing My Best and Doing Just Enough?

A MANOVA was conducted to explore whether *Doing My Best* and *Doing Just Enough* varied across students of different gender. Females reported the *Doing My Best* motivation ($M = 11.80$, $S.D. = 2.86$) significantly more than males, ($M = 11.24$, $S.D. = 2.93$; $F(1, 3841) = 36.71$, $p < .001$, partial $\eta^2 = .01$). Males reported the *Doing Just Enough* motivation ($M = 8.49$, $S.D. = 2.96$) significantly more than females, ($M = 7.83$, $S.D. = 2.76$; $F(1, 3841) = 50.63$, $p < .001$, partial $\eta^2 = .01$). It should be stressed here that this level of statistical significance may reflect the large sample size.

What is the relationship between student motivation and achievement?

The correlation between student motivation and measures of student achievement was examined first. Table 9 shows that for Year 11 students, *Doing My Best* was most strongly associated with higher levels of internal credits achieved with Excellence, and with external credits achieved with Merit and Excellence. *Doing Just Enough* was most strongly associated with fewer internal credits achieved with Merit and Excellence, and external credits achieved with Merit. Thus similar to our findings in previous years, *Doing My Best* is associated with higher achievement and *Doing Just Enough* is associated with lower achievement.

Table 9: The correlations between motivation in 2007 and achievement in 2007

	<i>Doing My Best</i>	<i>Doing Just Enough</i>
Total Credits	.28*	-.41*
Total US Credits	-.20*	.27*
Internal – ACH	-.22*	.05*
Internal – MER	.25*	-.38*
Internal – EXC	.42*	-.37*
External – NA	-.25*	.21*
External – ACH	.14*	-.30*
External – MER	.43*	-.42*
External – EXC	.42*	-.26*

Note: * = $p < .001$. Sample sizes differ across achievement measures.

Table 10 shows that *Doing My Best* in 2007 was most strongly associated with more total credits, internal excellence credits, and external merit and excellence credits in 2008. *Doing Just Enough* in 2007 was most strongly associated with fewer total credits and internal excellence credits, and more unit standard credits.

Table 10: The relationships between motivation in 2007 and achievement in 2008

	<i>Doing My Best</i>	<i>Doing Just Enough</i>
Total credits	.42*	-.44*
Total unit standard credits	-.23*	.32*
Internal – NA	-.21*	.23
Internal – ACH	-.22*	.19*
Internal – MER	.15*	-.20
Internal – EXC	.39*	-.35*
External – NA	-.13	.16
External – ACH	.01	-.14*
External – MER	.42*	-.23*
External – EXC	.44*	-.26*

Note: * = $p < .001$. Sample sizes differ across achievement measures.

Summary of Findings Relating Motivation to Achievement

By following the students participating in our research from 2005-2006 and 2006-2007, we have rich longitudinal data on how motivation orientations relate to subsequent academic achievement. We now have evidence across two years demonstrating that what students say about their motivation orientation earlier in their secondary school careers is predictive of how they will achieve on different NCEA outcomes, over and above what could be predicted based solely on previous achievement data.

These longitudinal data allowed us to identify different student cluster groups whose composite *Doing My Best* and *Doing Just Enough* scores were strongly related to actual achievement. We are interested in the characteristics and achievement of these different sub-groups; for example, groups still relatively high on *Doing My Best* but also high on the (negative) orientation *Doing Just Enough* may well be “underachievers” regardless of whether they are indeed attaining at a passing level. They may not even be aware of simultaneous and oppositional motivation orientations that may be having a negative impact on their opportunities and outcomes. Effective strategies focused on shifting to more positive motivation orientations and, particularly, to reduce the *Doing Just Enough* orientation could also be related to better achievement outcomes for students who show the most negative patterns. This exploratory work could lead to the development of a practical measure for teacher use in efforts to enhance student motivation, thereby promoting higher achievement for students at different levels.

We are following different motivation groups across years, and we have been able to identify sub-groups of students whose motivation shifts across time—some of whom dropped or increased as many as three motivation categories. Information about and from these young people might point to strategies that are being used and could be further developed for use in future research towards more positive motivation strategies and to prevent drops in motivation and achievement. This is a particularly promising area for future research based on our work to date.