

RESEARCH DIVISION  
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THE UNIVERSITY OF AUCKLAND  
NEW ZEALAND



MINISTRY OF EDUCATION  
Te Tihitanga o te Mātauranga

IN FOCUS

# ATTITUDES TO READING, WRITING & MATHEMATICS

INFORMATION KIT: STUDENT ACHIEVEMENT IN NEW ZEALAND





To Michelle  
From Lily

## New Zealand students' attitudes to reading, writing, and mathematics

Understanding children's attitudes is an important part of the Assessment Tools for Teaching and Learning (asTTle) educational resource. In addition to assessing how well they read, write, or do mathematics, asTTle also measured student attitudes towards those same subjects using six items developed by the National Education Monitoring Project (NEMP). Three questions in mathematics and reading, and two questions in writing asked how much the student liked the subject; in particular, the questions asked about students' enjoyment and involvement with the subject within and beyond school.

### Liking a subject:

- How much do you like [subject] in your own time (not at school)?
- How much do you like [subject] at school?
- How do you feel about going to a library to get something to read? (*Reading*)
- How do you feel about doing things in mathematics you haven't tried before? (*Mathematics*)

How much a student likes a subject typically depends on how confident the student is of their ability in that area. Three questions in mathematics and reading and four questions in writing asked how good students felt they were in their subjects, and whether they thought their teacher and parent or caregiver thought they were good at the subject. As confidence in a subject comes partly from the feedback they receive from teachers and parents/caregivers (Anthony & Walshaw, 2002), students were asked how they thought others viewed their ability.

### Confidence in a subject:

- How good do you think you are at [subject]?
- How good does your [subject] teacher think you are at [subject]?
- How good does your Mum or Dad think you are at [subject]?
- How good do you think you are at spelling? (*Writing*)

In each item students indicated their answer by choosing one of four faces. A score of:

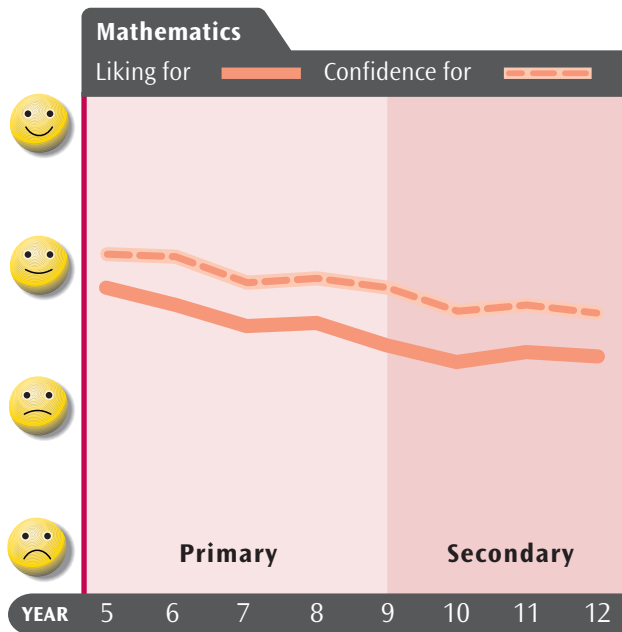
- 1 (☹️) indicated strong dislike or very low confidence
- 2 (😞) meant dislike or low confidence
- 3 (🙂) meant like or moderate confidence
- 4 (😊) meant strong liking or very high confidence.

The average of the 'liking a subject' items and 'confidence in a subject' items was used to indicate each student's overall preference for a subject.

This monograph uses data collected from students in Years 5 to 12 who sat asTTle tests in English-medium subjects from 2000 to 2004, with approximately 21,000 students answering attitude questions in mathematics, 19,000 in reading, and 20,000 in writing.

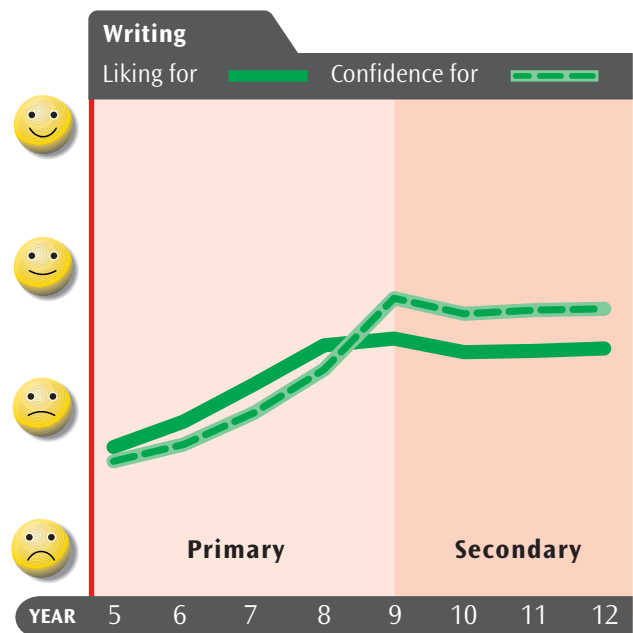
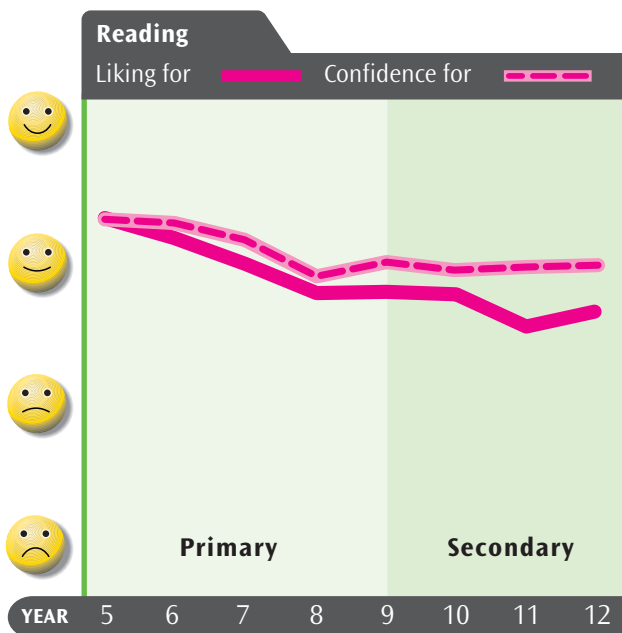


FIGURE 1. Average attitudes to subjects by year.



## Attitudes across years

In general, student preference for and confidence in a given subject were at similar levels. The separation between the two measures was usually less than half the distance between 'dislike' and 'like,' or between 'low' and 'moderate' confidence (Figure 1). The average scores for liking and confidence ranged between 1.5 (dislike/very low confidence) and 3.5 (moderate-strong liking/moderate-strong confidence). Generally, students liked and were more confident in reading than writing with attitudes to mathematics in between. In both mathematics and reading, positive attitudes generally decreased across the years. Primary school students had increasing confidence in their abilities in and liking of writing, but this reached a plateau at secondary school.



## Attitudes and gender

In mathematics, boys and girls had a similar pattern of liking and confidence, but boys had more positive attitudes than girls (Figure 2).

In reading, boys and girls had similar levels of confidence across the years, but boys liked the subject less than girls did.

In writing, both boys and girls had increasingly positive attitudes in primary school; however, there was a noticeable decrease in boys' liking for writing at Year 9, and their liking for the subject was considerably lower than girls throughout secondary school.

FIGURE 2. Average attitudes to subjects by gender.

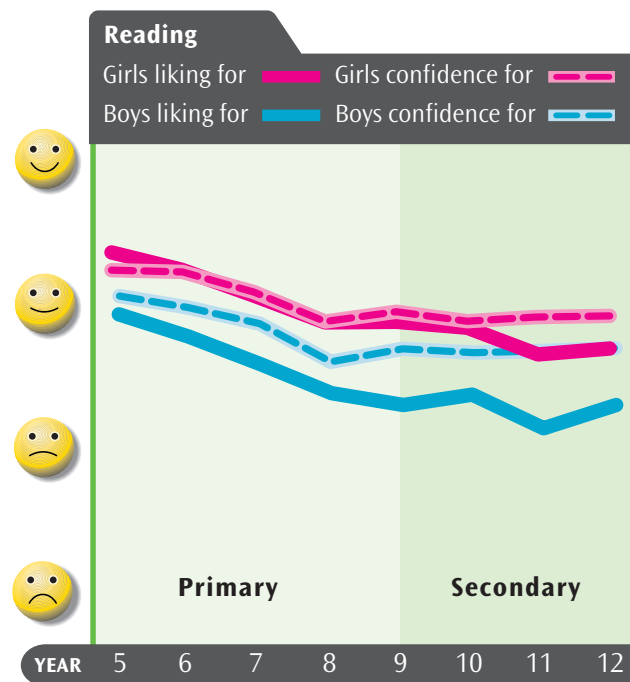
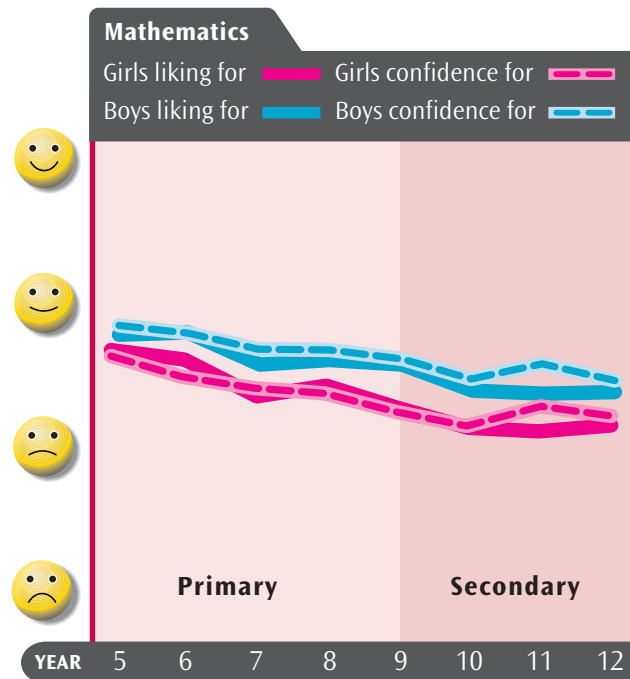
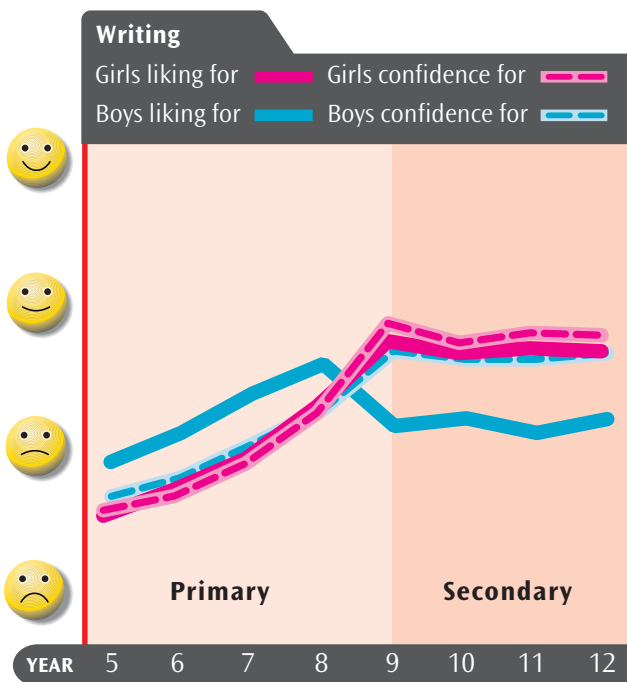
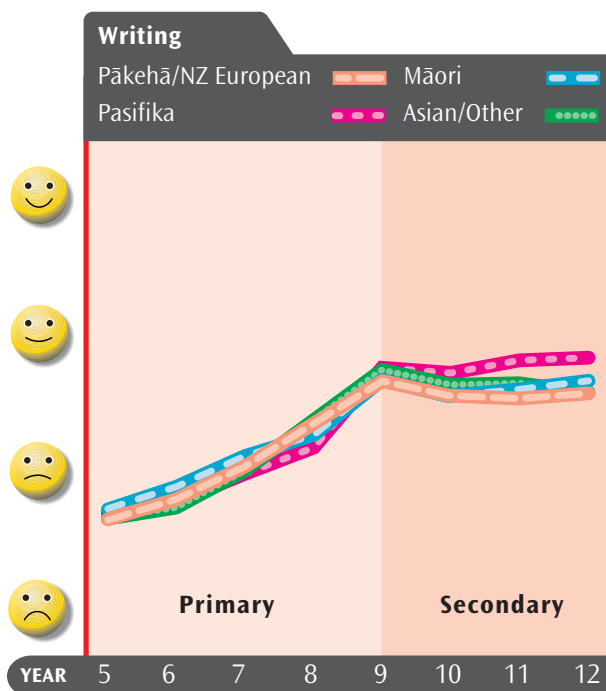
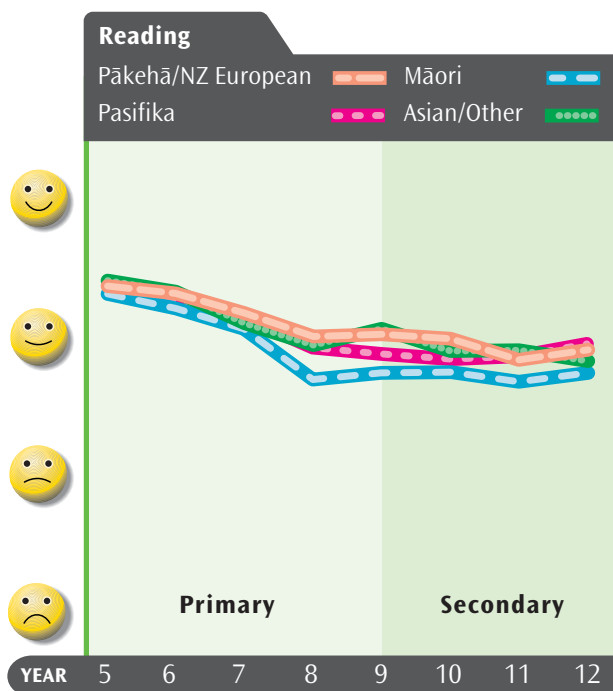
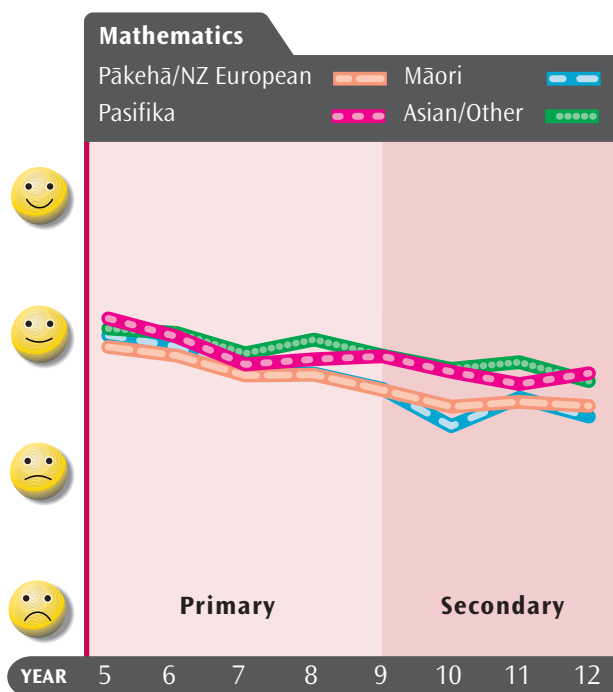


FIGURE 3. Average combined attitudes to subjects by ethnicity.



## Attitudes and ethnicity

Since the difference between liking and confidence was small, it was easier to combine all six attitude questions to examine the relationship of student ethnicity to attitude across the years (Figure 3). All ethnic groups exhibited much the same trend of attitudes to each subject with differences between ethnicities small. In mathematics Asian/Other<sup>1</sup> and Pasifika students generally had more positive combined attitudes than Pākehā/NZ European and Māori students. Māori students had the lowest combined attitudes in reading with little difference seen amongst the other ethnicities. In writing Pasifika students had lower attitudes than other ethnicities at primary school but the most positive attitude at secondary school.

<sup>1</sup> Note the number of students reporting themselves as Asian or Other ethnicity was too low to provide robust statistics separately and so these two groups have been merged.

## Attitudes and school type

Students' liking of and confidence in a subject were also combined to examine the effect of school type at primary schools. About 40% of students follow the contributing intermediate school path from Year 5 to 8, with the larger proportion remaining in full primary schools. School type appeared to have little effect on combined attitudes across all subjects (Figure 4). Students attending contributing schools did have slightly more positive attitudes than students at full primaries in reading and slightly less positive attitudes in writing. Students at intermediates had less positive attitudes in mathematics and more positive attitudes in writing. However, these differences were so small they were mostly within chance of each other.

FIGURE 4. Average combined attitudes to subjects by school type.

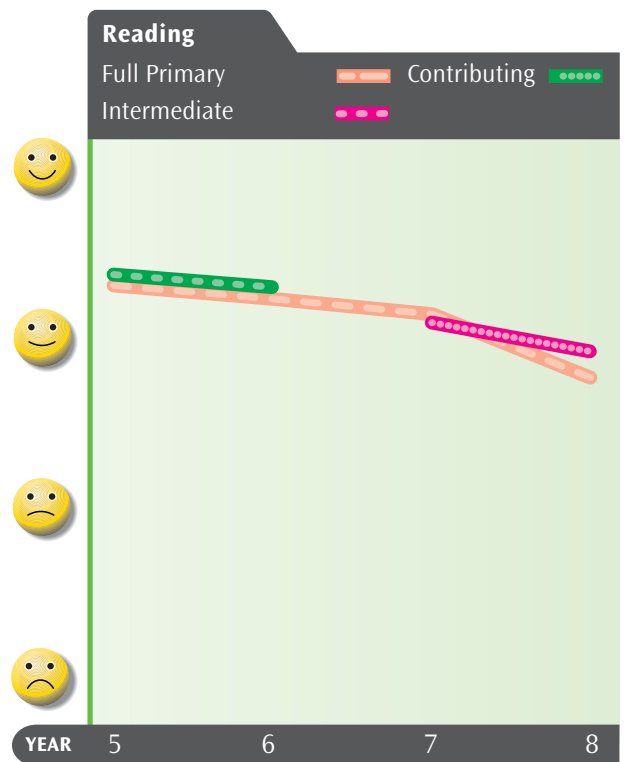
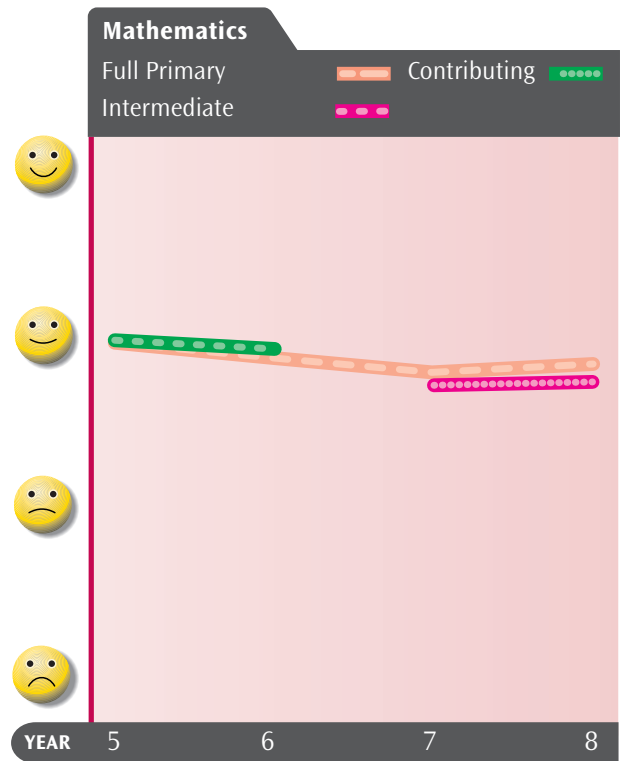
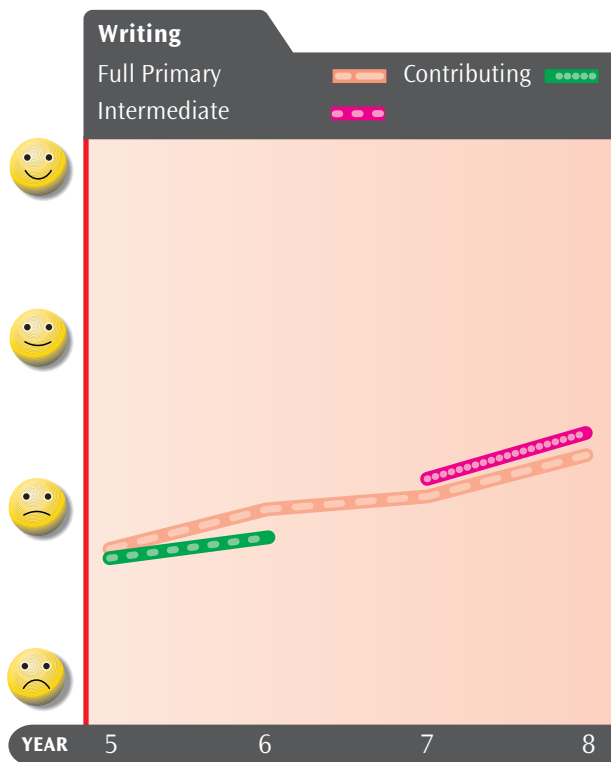
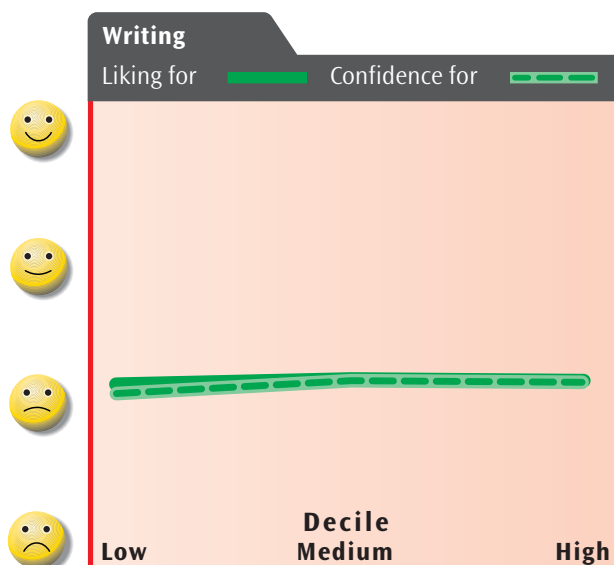
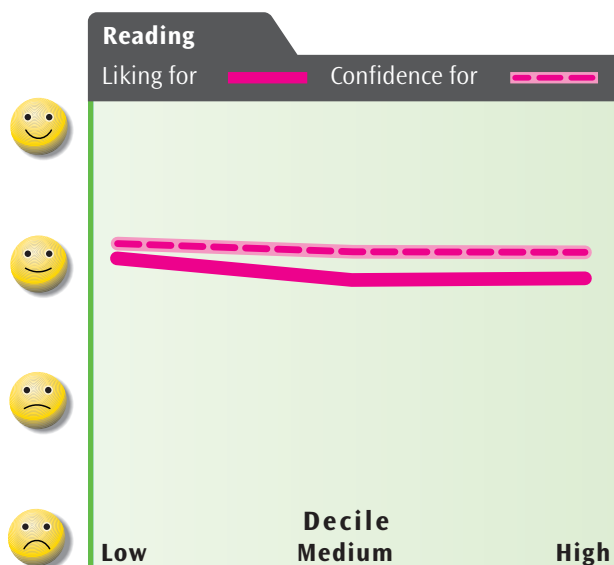
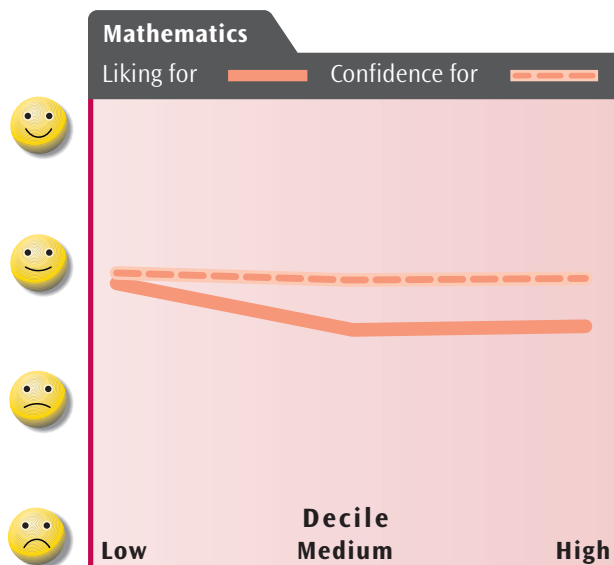


FIGURE 5. Average attitudes to subjects by school decile.

## Attitudes and school decile

The asTTle student attitude data was examined by grouping school decile (Figure 5). Students in low decile schools (ie, deciles 1 to 3) on average liked mathematics slightly more than their middle (4 to 7) and high (8 to 10) decile counterparts, while there was little difference in their confidence in doing the subject. Middle and high decile school students also liked reading slightly less than low decile school students, but generally any differences across decile in reading and writing were minimal. Clearly going to a higher decile school did not guarantee a positive attitude towards or high level of confidence in one's ability.





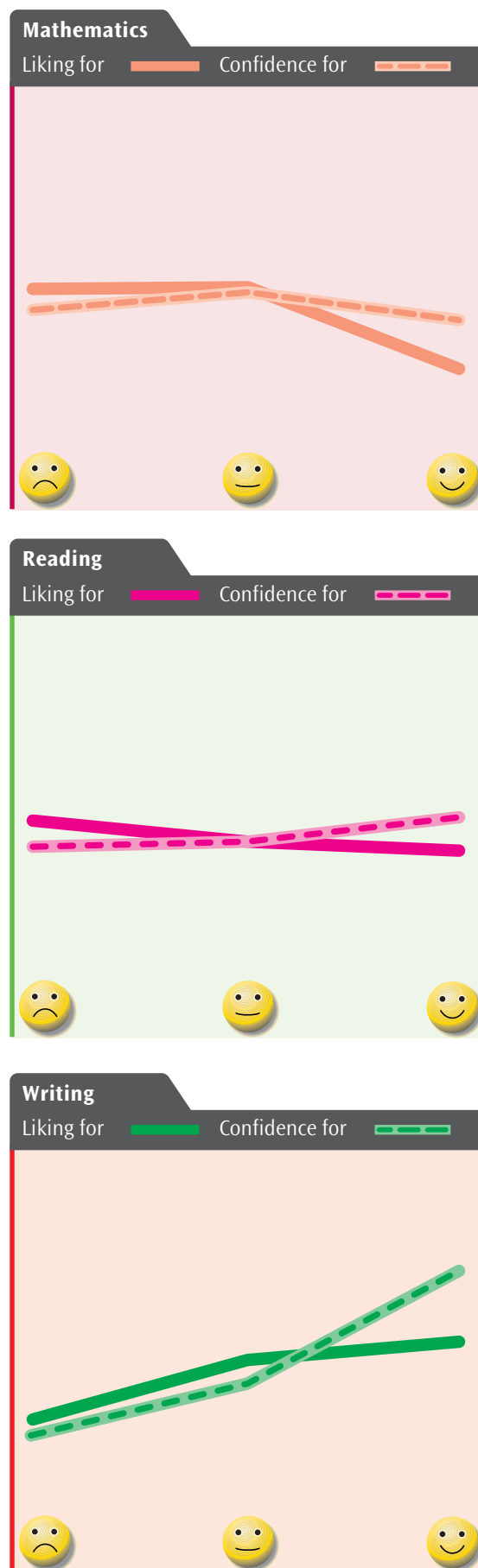
## Attitudes and achievement

The analysis of data examined the relationship of students' attitudes to their actual achievement in aSTLE tests (Figure 6). Each student was classified as having either a low, medium, or high attitude and the average score for each group of students was calculated. In mathematics those students who liked mathematics the most scored the lowest; there was no noticeable difference in achievement between students with a medium or low liking of mathematics. The relationship between confidence in mathematics and achievement was less clear; students with medium confidence levels had somewhat higher mathematics scores than those with high or low confidence. There was a slight increase in reading achievement with increased confidence and a slight decrease in reading achievement with increased liking. However, these differences are relatively small. A definite trend of increasing achievement with increasing attitude can be seen in writing; students who were most confident and who liked writing the most scored highest.

Further analyses showed that despite the apparent negative relationship of attitude to achievement in reading and mathematics (Figure 6), when the year level of the student was taken into account, there was a positive but weak relationship between attitude and achievement. In other words, the students who were more positive towards the subject at each year did tend to score higher than those with negative attitudes<sup>2</sup>. However, as year increased, even the higher-achieving students had less positive attitudes. This positive yet weak relationship with achievement was in line with international research on student attitudes and achievement. In contrast, the relationship of attitude to achievement in writing was nearly zero when year was taken into account; in other words, the positive relationship seen in Figure 6 was a function of age not attitude.

Across ethnicities the attitudes of Māori students towards all three subjects showed the least positive relationship to achievement scores<sup>3</sup>. The strongest relationship between student attitudes and achievement was found in writing confidence and liking for ethnic groups. However, all these relationships were small to moderate, suggesting that students' ethnicity is not a significant indication of attitudes towards subjects and achievement. It should be noted that the correlation between achievement and attitude is negative in reading and mathematics for Māori and Pasifika students; this indicated those students tended to have low scores despite having positive attitudes.

FIGURE 6. Average attitudes to subjects by achievement in subjects.



2 Mathematics had a correlation of 0.21, reading a correlation of 0.32, and writing 0.064.

3 Pearson correlation coefficient ranged from -0.25 for liking of reading to 0.24 for confidence in writing.

## Concluding comments on attitudes

Based on students' own reported liking of subjects and their confidence to do those subjects, it was apparent that a positive attitude did reflect, to a small degree, greater educational success. Because appropriate encouragement and expectations from home and teachers leads to schooling success (Schunk & Pajares, 2002), it is important students know what others think of their abilities. Attention to improving students' attitudes is also important as attitudes influence whether students choose to stay with subjects, and increase their effort into more challenging tasks in these subjects (Brown & Inouye, 1978; Schunk, 1984).

For schools and parents other issues of concern raised by these data are:

- the plateau of student attitudes through secondary schooling
- the mixed impact of full primary and intermediate schools on students' attitudes
- the significant decline in attitudes towards mathematics
- the low level of attitude on the part of Māori students
- the low level of attitude towards writing.

It is important to continue to elicit from students what they believe about their subjects and their abilities. This information needs to be used by teachers and parents to help students gain an appropriate appreciation of what it means to learn and succeed.

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