## 66 CHAPTER 9 PACIFIC SUBGROUPS

A new feature in National Monitoring since 1999 has been the commitment to look directly at the achievement of Pacific students in New Zealand primary and intermediate schools. These students were among the samples in NEMP assessments between 1995 and 1998, but not in sufficient numbers to allow their results to be reported separately. At the request of the Ministry of Education, NEMP now selects special additional samples of 120 year 4 students and 120 year 8 students to allow the achievement of Pacific students to be assessed and reported. The augmented samples are too small, however, to allow separate reporting on students from different Pacific nations (such as Samoa, Tonga, and Fiji).

The augmented samples are drawn from schools with at least 15 percent Pacific students. Schools in this category comprise about 10 percent of New Zealand schools and include about 15 percent of all students. About 75 percent of Pacific students attend such schools.

All schools in the main NEMP year 8 sample that had 15 percent or more Pacific students (as classified in school records) were selected. All other schools nationally with at least 12 year 8 students and at least 15 percent Pacific students in their total roll were identified, and an additional random sample of 10 schools drawn from this list. A similar procedure was followed at year 4 level, except that schools already chosen at year 8 level were excluded from the sampling list. From each specially sampled school, 12 students (in 3 groups of 4) were sampled, confirmed and assessed using exactly the same procedures as in the main sample. The students' performances were also scored in the same manner as the performances of students in the main sample.

The results for Pacific, Māori, and other students in the schools with more than 15 percent Pacific students were then compared. Because all of the schools chosen for these analyses have at least 15 percent Pacific students, the results only apply to students at schools like these.

Differences among the three ethnic groups of students were checked for statistical significance using one way analysis of variance on the overall scores for each task attempted by individual students (team tasks were excluded). Each analysis compared the performance of about 50 Pacific students, 30 Māori students and 30 other students. The critical level for statistical significance was set at p = .05 (so that differences this large or larger among the subgroups would not be expected by chance in more than five percent of cases). Where statistical significance occurred, Tukey tests were used to identify which groups differed significantly.

The mean scores for each group on each task are presented in the tables below, together with the standard deviations for all students in this sample. Statistically significant differences are clearly indicated.

## YEAR 4

Average (mean) marks for year 4 students, attending schools enrolling at least fifteen percent Pacific students, who are classified as Pacific students, Māori students or other students

Statistically significant (p<.05) differences among the means are shown thus: significantly *lower* or higher.

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| Subtraction Facts     | 22.5           | 23.4        | 21.3   | 8.2     |        |
| <b>Division Facts</b> | 7.7            | 8.7         | 13.0   | 8.8     |        |
| Addition Examples     | 2.7            | 3.2         | 3.2    | 1.5     |        |
| Multiplication Examp  | les <b>1.0</b> | 1.2         | 1.9    | 1.6     |        |
| Calculator Ordering   | 4.5            | 4.8         | 5.7    | 0.9     |        |
| Pizza Pieces          | 1.3            | 1.7         | 1.9    | 1.4     |        |
| Girls and Boys        | 3.2            | 3.7         | 4.3    | 1.9     |        |
| Kumara Basket         | 0.8            | 0.7         | 1.0    | 1.0     |        |
| Speedo                | 0.4            | 0.4         | 1.2    | 1.4     |        |
| Jack's Cows           | 1.6            | 2.3         | 3.3    | 1.9     |        |
| 36 and 29             | 0.4            | 0.5         | 0.6    | 0.5     |        |
| Motorway              | 0.0            | 0.3         | 0.1    | 0.6     |        |
| Wallies               | 1.0            | 0.9         | 0.8    | 0.7     |        |
| Fractions             | 0.3            | 0.8         | 1.8    | 1.8     |        |
| Number Items B        | 3.1            | <b>3.2</b>  | 5.2    | 2.8     |        |
| Number Items C        | 3.4            | 3.8         | 5.0    | 2.9     |        |
| Population (Y4)       | 3.4            | <b>3.2</b>  | 5.3    | 1.4     |        |
| Number Line (Y4)      | 0.5            | 0.8         | 1.0    | 1.0     |        |
| Link Task 1           | 25.6           | <i>23.2</i> | 28.8   | 7.1     |        |
| Link Task 2           | 15.2           | 12.5        | 19.6   | 8.2     |        |
| Link Task 3           | 1.9            | 1.9         | 3.2    | 1.6     |        |
| Link Task 4           | 0.9            | 1.5         | 2.1    | 1.7     |        |
| Link Task 5           | 4.5            | 5.2         | 5.9    | 2.7     |        |
| Link Task 6           | <b>6.2</b>     | 5.1         | 8.1    | 2.7     |        |
| Link Task 7           | 0.9            | 0.8         | 1.4    | 1.0     |        |
| Link Task 8           | 2.1            | 2.3         | 3.0    | 1.7     |        |

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| Link Task 9            | 1.4     | 1.7     | 2.0                   | 1.0           | Link Task 20       | 1.0     | 1.0        | 1.3   | 0.9            |
| Link Task 10           | 1.9     | 2.5     | 3.8                   | 2.0           | Link Task 21       | 5.1     | 5.9        | 6.6   | 2.3            |
| Apples                 | 0.6     | 0.6     | 0.8                   | 0.7           | Cut Cube           | 0.2     | 0.5        | 0.7   | 0.7            |
| Better Buy             | 0.7     | 0.7     | 1.2                   | 1.3           | Hedgehog           | 1.8     | 2.2        | 3.3   | 1.8            |
| Measures               | 7.2     | 9.4     | 11.2                  | 4.3           | Shapes & Nets      | 2.3     | 1.8        | 3.9   | 2.2            |
| Bean Estimates         | 0.8     | 1.0     | 1.1                   | 0.8           | One Cut            | 1.0     | 1.0        | 1.7   | 2.3            |
| Lump Balance           | 2.7     | 2.8     | 3.5                   | 1.3           | Paper Folds        | 0.0     | 0.0        | 0.2   | 0.3            |
| Video Recorder         | 1.3     | 1.6     | 2.1                   | 1.4           | Line of Symmetry   | 0.4     | 0.6        | 0.6   | 0.5            |
| Measurement Items B    | 2.1     | 2.1     | 3.4                   | 1.8           | Whetu's Frame      | 0.3     | 0.5        | 0.6   | 0.7            |
| Measurement Items C    | 2.8     | 2.3     | 3.6                   | 1.8           | Link Task 24       | 4.4     | 4.4        | 6.2   | 3.1            |
| Party Time             | 0.5     | 0.5     | 1.0                   | 1.0           | Link Task 25       | 2.9     | <i>2.8</i> | 3.5   | 0.9            |
| What's the Time        | 0.7     | 0.9     | 1.2                   | 0.8           | Link Task 26       | 2.2     | 2.0        | 1.8   | 1.8            |
| Stamps                 | 0.3     | 0.2     | 0.4                   | 0.4           | Link Task 27       | 1.6     | 1.4        | 1.8   | 1.0            |
| Bank Account           | 1.9     | 0.8     | 3.4                   | 2.3           | Link Task 28       | 2.4     | 2.6        | 2.8   | 1.3            |
| Money A                | 0.3     | 0.4     | 1.0                   | 0.7           | Train Trucks       | 5.0     | 5.5        | 5.7   | 1.8            |
| Team Photo             | 3.3     | 3.4     | 3.6                   | 1.0           | Algebra Items A    | 0.5     | 0.7        | 0.9   | 0.8            |
| Broken Ruler           | 0.4     | 0.6     | 1.2                   | 0.9           | Algebra Items B    | 5.2     | 5.1        | 9.1   | 3.4            |
| Pebbles Packet         | 1.4     | 1.9     | 2.4                   | 1.9           | Statistics Items A | 0.4     | 0.4        | 0.5   | 0.6            |
| Fishing Competition (Y | 4)2.2   | 2.3     | 2.6                   | 1.0           | Statistics Items B | 0.2     | 0.2        | 0.3   | 0.4            |
| Link Task 13           | 1.2     | 2.4     | 3.0                   | 3.3           | Bag of Beans       | 0.6     | 0.7        | 1.0   | 0.7            |
| Link Task 14           | 0.9     | 1.1     | 1.4                   | 1.3           | Link Task 30       | 2.0     | 2.3        | 2.6   | 2.1            |
| Link Task 15           | 0.5     | 0.6     | 1.0                   | 1.2           | Link Task 31       | 1.0     | 1.0        | 2.6   | 1.3            |
| Link Task 16           | 5.4     | 5.6     | 6.5                   | 2.3           | Link Task 32       | 0.4     | 0.4        | 0.7   | 0.5            |
| Link Task 17           | 0.5     | 0.7     | 1.3                   | 1.2           | Link Task 33       | 1.2     | 1.6        | 2.1   | 1.4            |
| Link Task 18           | 3.1     | 3.1     | 3.8                   | 1.9           | Link Task 34       | 0.3     | 0.2        | 0.5   | 0.7            |
| Link Task 19           | 1.1     | 2.2     | 4.1                   | 3.0           |                    |         |            |       |                |

For year 4 students, there were statistically significant differences in performance among the three groups on 39 of the 77 tasks:

- ➤ on 14 tasks both Pacific and Māori students scored lower than "other" students;
- on 21 tasks only Pacific students scored lower than "other" students;
- ➤ on 4 tasks only Māori students scored lower than "other" students.

Thus Pacific students scored lower than "other" students on 45 percent of the tasks and Māori students scored lower than "other" students on 23 percent of the tasks..

On the Year 4 Mathematics Survey (p62), there was a statistically significant difference on 1 of the 11 rating items. The Māori students were more positive than the "other" students on question 2 (how much they liked doing maths at school).

## YEAR 8

Average (mean) marks for year 8 students, attending schools enrolling at least fifteen percent Pacific students, who are classified as Pacific students, Māori students or other students

Statistically significant (p<.05) differences among the means are shown thus: significantly *lower* or higher.

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| Subtraction Facts      | 287           | 20.0       | 20.2       | 0 <sup>7</sup>   | Link Task 12         | Link Task 12 2.2          | Link Task 12 <b>2.2</b> 2.9   | Link Task 12 <b>2.2</b> 2.9 <b>3.5</b>   | Link Task 12 <b>2.2</b> 2.9 <b>3.5</b> 1.6        |
| Division Facts         | 20.7          | 29.0       | 29.2       | 7.3  | Apples               | Apples 3.6                | Apples 3.6 <b>3.1</b>         | Apples 3.6 <b>3.1</b> 4.4                | Apples 3.6 <b>3.1</b> 4.4 1.9                     |
| Addition Examples      | 5.8           | 5.2        | 5.9        | 1.3  | Better Buy           | Better Buy 2.3            | Better Buy 2.3 2.3            | Better Buy 2.3 2.3 2.7                   | Better Buy 2.3 2.3 2.7 1.6                        |
| Multiplication Example | 9.0<br>es 4.6 | 4.8        | ).)<br>4 4 | 1.5  | Measures             | Measures 12.6             | Measures 12.6 10.8            | Measures 12.6 10.8 11.8                  | Measures 12.6 10.8 11.8 3.3                       |
| Calculator Ordering    | 7.6           | 7.6        | 8.2        | 1.0  | Bean Estimates       | Bean Estimates 1.7        | Bean Estimates 1.7 1.6        | Bean Estimates 1.7 1.6 1.6               | Bean Estimates 1.7 1.6 1.6 0.9                    |
| Pizza Pieces           | 3.1           | 2.9        | 3.6        | 1.7  | Lump Balance         | Lump Balance 3.8          | Lump Balance 3.8 <b>3.5</b>   | Lump Balance 3.8 <b>3.5</b> 4.2          | Lump Balance 3.8 <b>3.5 4.2</b> 0.9               |
| Fauivalents            | 3.8           | 4.0        | 6.5        | 4.0  | Video Recorder       | Video Recorder 2.9        | Video Recorder 2.9 2.2        | Video Recorder <b>2.9 2.2</b> 4.0        | Video Recorder <b>2.9 2.2 4.0</b> 1.9             |
| Kumara Basket          | 2.1           | 1.0        | 2.2        | 0.9  | Measurement Items B  | Measurement Items B 4.1   | Measurement Items B 4.1 4.5   | Measurement Items B 4.1 4.5 5.4          | Measurement Items B <b>4.1</b> 4.5 <b>5.4</b> 1.9 |
| Speedo                 | 4.1           | 3.6        | 43         | 3.1  | Measurement Items C  | Measurement Items C 2.2   | Measurement Items C 2.2 3.2   | Measurement Items C 2.2 3.2 3.5          | Measurement Items C <b>2.2</b> 3.2 3.5 1.8        |
| Jack's Cows            | 3.2           | 4 5        | 4.6        | 2.1  | Supermarket Shopping | Supermarket Shopping 1.8  | Supermarket Shopping 1.8 1.6  | Supermarket Shopping 1.8 1.6 2.5         | Supermarket Shopping <b>1.8 1.6 2.5</b> 1.0       |
| 36 and 29              | 0.8           | 0.5        | 0.6        | 0.7  | Two Boxes            | Two Boxes 0.2             | Two Boxes 0.2 <b>0.0</b>      | Two Boxes 0.2 <b>0.0</b> 0.6             | Two Boxes 0.2 <b>0.0</b> 0.6 0.7                  |
| Motorway               | 0.6           | 0.5        | 0.8        | 1.1  | Stamps               | Stamps 0.6                | Stamps 0.6 0.5                | Stamps 0.6 0.5 0.7                       | Stamps 0.6 0.5 0.7 0.5                            |
| Wallies                | 1.1           | 1.4        | 1.2        | 0.9  | Bank Account         | Bank Account 5.0          | Bank Account5.04.1            | Bank Account 5.0 4.1 5.5                 | Bank Account 5.0 4.1 5.5 2.9                      |
| Fractions              | 73            | 94         | 9.9        | 8.4  | Money Items A        | Money Items A 1.6         | Money Items A 1.6 1.2         | Money Items A 1.6 1.2 1.6                | Money Items A 1.6 1.2 1.6 1.0                     |
| Number Items B         | 10.0          | 9.4        | 13.3       | 47   | Team Photo           | Team Photo 3.8            | Team Photo 3.8 3.9            | Team Photo 3.8 3.9 4.0                   | Team Photo 3.8 3.9 4.0 0.5                        |
| Number Items C         | 9.0           | 10.6       | 12.0       | 4.4  | Broken Ruler         | Broken Ruler 1.4          | Broken Ruler 1.4 1.6          | Broken Ruler 1.4 1.6 1.9                 | Broken Ruler 1.4 1.6 1.9 1.1                      |
| Number Line            | 2.6           | 1.8        | 4.0        | 2.6  | Pebbles Packet       | Pebbles Packet <b>3.9</b> | Pebbles Packet <b>3.9</b> 5.2 | Pebbles Packet <b>3.9</b> 5.2 <b>5.9</b> | Pebbles Packet <b>3.9 5.2 5.9 3.2</b>             |
| Population             | 5.3           | 4.6        | 6.9        | 2.4  | Fishing Competition  | Fishing Competition 3.1   | Fishing Competition 3.1 2.8   | Fishing Competition 3.1 2.8 3.9          | Fishing Competition 3.1 2.8 3.9 2.1               |
| Strategy               | 1.3           | 1.8        | 1.8        | 1.2  | Milkogram            | Milkogram <b>0.7</b>      | Milkogram <b>0.7</b> 1.2      | Milkogram <b>0.7</b> 1.2 1.4             | Milkogram <b>0.7</b> 1.2 <b>1.4</b> 1.1           |
| Missing the Point      | 0.2           | 0.2        | 0.4        | 0.4  | Running Records      | Running Records 1.7       | Running Records1.71.7         | Running Records 1.7 1.7 2.4              | Running Records 1.7 1.7 2.4 1.1                   |
| Link Task 1            | 28.9          | 29.6       | 29.5       | 1.4  | Link Task 13         | Link Task 13 8.7          | Link Task 13 8.7 7.1          | Link Task 13 8.7 7.1 7.9                 | Link Task 13 8.7 7.1 7.9 4.4                      |
| Link Task 2            | 26.2          | 23.3       | 28.3       | 5.4  | Link Task 14         | Link Task 14 2.5          | Link Task 14 2.5 3.4          | Link Task 14 2.5 3.4 3.2                 | Link Task 14 2.5 3.4 3.2 1.5                      |
| Link Task 3            | 5.4           | 7.0        | 6.7        | 2.8  | Link Task 15         | Link Task 15 2.9          | Link Task 15 2.9 2.7          | Link Task 15 2.9 2.7 3.7                 | Link Task 15 2.9 2.7 3.7 2.0                      |
| Link Task 4            | 6.1           | 5.2        | 6.6        | 3.5  | Link Task 16         | Link Task 16 <b>9.2</b>   | Link Task 16 <b>9.2</b> 10.5  | Link Task 16 <b>9.2</b> 10.5 9.7         | Link Task 16 <b>9.2</b> 10.5 9.7 2.0              |
| Link Task 5            | 14.9          | 14.2       | 14.7       | 3.3  | Link Task 17         | Link Task 172.6           | Link Task 17 2.6 2.7          | Link Task 17 2.6 2.7 3.0                 | Link Task 17 2.6 2.7 3.0 1.5                      |
| Link Task 6            | 8.4           | 6.5        | 8.7        | 4.1  | Link Task 18         | Link Task 18 <b>3.6</b>   | Link Task 18 <b>3.6 4.3</b>   | Link Task 18 <b>3.6 4.3</b> 5.5          | Link Task 18 <b>3.6 4.3</b> 5.5 1.9               |
| Link Task 7            | 1.8           | 1.5        | 2.8        | 1.2  | Link Task 19         | Link Task 19 <b>4.7</b>   | Link Task 19 4.7 4.4          | Link Task 19 <b>4.7 4.4</b> 6.7          | Link Task 19 <b>4.7 4.4 6</b> .7 3.5              |
| Link Task 8            | 4.1           | 2.8        | 4.0        | 1.4  | Link Task 20         | Link Task 20 <b>1.4</b>   | Link Task 20 <b>1.4</b> 2.1   | Link Task 20 <b>1.4</b> 2.1 2.3          | Link Task 20 <b>1.4</b> 2.1 2.3 1.0               |
| Link Task 9            | 2.8           | 3.0        | 3.4        | 1.4  | Link Task 21         | Link Task 215.9           | Link Task 21 5.9 4.7          | Link Task 21 5.9 4.7 5.9                 | Link Task 21 5.9 4.7 5.9 2.4                      |
| Link Task 10           | 7.9           | 6.3        | 8.7        | 3.7  | Link Task 22         | Link Task 225.2           | Link Task 22 5.2 3.6          | Link Task 22 5.2 3.6 5.8                 | Link Task 22 5.2 3.6 5.8 4.6                      |
| Link Task 11           | 1.6           | 1.8        | 1.8        | 1.0  | Link Task 23         | Link Task 23 1.1          | Link Task 23 1.1 0.9          | Link Task 23 1.1 0.9 1.6                 | Link Task 23 1.1 0.9 1.6 1.2                      |

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| Cut Cube           | 1.4         | 1.6         | 1.8 | 1.5                |
| Hedgehog           | 5.3         | 6.1         | 5.2 | 2.4                |
| Flat Shapes        | 4.1         | 4.3         | 6.5 | 2.2                |
| Shapes & Nets      | 4.5         | 3.7         | 5.3 | 2.7                |
| One Cut            | 3.7         | 3.7         | 3.9 | 4.4                |
| Paper Folds        | 0.7         | 0.6         | 0.7 | 0.5                |
| Line of Symmetry   | 0.9         | 0.8         | 0.9 | 0.3                |
| Whetu's Frame      | 1.3         | 1.1         | 1.7 | 1.0                |
| Grid Plans         | 2.0         | 1.9         | 2.5 | 1.7                |
| Boats              | 1.5         | 1.5         | 2.1 | 1.7                |
| Link Task 24       | 6.4         | 6.4         | 6.8 | 3.3                |
| Link Task 25       | 4.2         | 3.8         | 4.5 | 1.2                |
| Link Task 26       | 3.2         | 3.3         | 3.9 | 1.9                |
| Link Task 27       | 2.0         | 2.0         | 2.1 | 0.9                |
| Link Task 28       | 3.3         | 3.1         | 3.6 | 1.3                |
| Link Task 29       | 1.1         | 0.7         | 1.3 | 1.1                |
| Train Trucks       | 7.4         | 11.0        | 8.6 | 2.6                |
| Algebra Items A    | 2.5         | 1.9         | 2.7 | 1.5                |
| Algebra Items B    | 5.6         | <b>3.</b> 7 | 7.8 | 4.2                |
| Statistics Items A | <b>0.</b> 7 | 0.9         | 1.3 | 0.7                |
| Statistics Items B | 0.6         | 0.6         | 1.1 | 0.8                |
| Bag of Beans       | 1.3         | 1.6         | 1.6 | 0.6                |
| Games              | 0.8         | 1.2         | 1.9 | 1.5                |
| How Far?           | 0.4         | 0.3         | 1.0 | 0.8                |
| Link Task 30       | 6.0         | 5.6         | 6.4 | 2.9                |
| Link Task 31       | 1.2         | 1.8         | 2.0 | 1.4                |
| Link Task 32       | 1.4         | 0.9         | 1.7 | 1.3                |
| Link Task 33       | <i>2.8</i>  | 2.9         | 3.7 | 1.6                |
| Link Task 34       | 0.6         | 1.4         | 1.7 | 1.4                |
| Link Task 35       | 0.5         | 0.4         | 0.6 | 0.5                |
| Link Task 36       | 1.1         | 1.3         | 1.2 | 1.4                |

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For year 8 students, there were statistically significant differences in performance among the three groups on 35 of the 93 tasks:

- ➤ on 11 tasks both Pacific and Māori students scored lower than "other" students;
- on 13 tasks only Pacific students scored lower than "other" students;
- on 6 tasks only Māori students scored lower than "other" students;
- on 2 tasks Māori students scored lower than both Pacific and "other" students;
- on 1 task Pacific and "other" students scored lower than Māori students;
- on 1 task Pacific students scored lower than just Māori students;
- on 1 task Pacific students scored lower than both Māori and "other" students.

Thus Pacific students scored lower than "other" students on 27 percent of tasks (and never higher), and Māori students scored lower than "other" students on 20 percent of tasks (and higher on 1 percent of tasks). Pacific students scored lower than Māori students on 3 percent of tasks and higher on 2 percent of tasks.

On the *Year 8 Mathematics Survey* (p62), there was a statistically significant difference on 1 of the 11 rating items. The Pacific students were more positive than both Māori and "other" students on Question 8 (How much do you like helping others with maths?).

## Summary

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In schools with more than 15 percent Pacific students, Year 4 Pacific students performed similarly to their Māori peers, but less well than "other" students on 45 percent of the tasks. Year 8 Pacific students performed similarly to their Māori peers, but less well than "other" students on 27 percent of the tasks.