

# New Zealand Students' Engagement with the PIRLS 2006 Reading Passages

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## Abstract

Results from the Progress in International Reading Literacy Study (PIRLS) 2001 and 2006 show New Zealand to have one of the largest differences, in favor of girls, between Grade 4 boys' and girls' mean reading literacy achievement. This paper summarizes the findings from an "enjoyment" survey administered to approximately 6,300 New Zealand Grade 4 children who participated in the PIRLS 2006 main survey. The purpose of the research was to investigate whether or not the students engaged with the PIRLS 2006 reading passages, the reasons why they liked them, and whether or not their engagement with the reading material related to their reading achievement as measured by PIRLS. The findings, both qualitative and quantitative, show that the majority of New Zealand students enjoyed the passages, with girls generally more positive than boys with their endorsements. For some passages, there were small effects of liking the passage on student achievement. Furthermore, there did appear to be some position effect on achievement for some passages, and more so for boys. As well as providing insight for researchers and practitioners into the features of the passages that appealed to students, the information arising from this research should be useful in informing the selection of reading passages, and the design and rotation scheme used in PIRLS 2011.

**Keywords:** *PIRLS 2006, student reading engagement, assessment, gender differences*

## Introduction

### *Background*

The Progress in International Reading Literacy Study (PIRLS) 2001 showed that, when compared with other countries, New Zealand had one of the largest differences between boys' and girls' mean reading achievement (Mullis, Martin, Gonzalez, & Kennedy, 2003). Although the reported gender difference was consistent with other national and international studies (Crooks & Flockton, 2005; Satherley, 2006; Wagemaker, 1993), it was the magnitude of the mean difference *relative* to that of other countries which raised the researchers' interest in the area. Was the gender difference in reading literacy achievement exacerbated by the nature of the reading passages used in PIRLS 2001? PIRLS 2006 thus provided an opportunity to determine whether or not New Zealand's Grade 4 students liked the passages they read and then assessed.

### *The New Zealand Context*

PIRLS, one of three international studies in which New Zealand regularly participates that provide information on the education system's performance in an international context, is used extensively by the Ministry of Education to identify strengths and weaknesses in the system. Building on a comprehensive gender-related literature review undertaken by Alton-Lee and Praat (2000) that highlighted differences between boys' and girls' literacy

outcomes, a recent synthesis of data from the national and international assessment studies, including PIRLS 2001, emphasized again the differences between girls and boys in favor of girls in this area. Furthermore, significant achievement gaps between girls' and boys' literacy achievement start to appear soon after the beginning of compulsory schooling and persist until the end (Ministry of Education, 2007). However, New Zealand boys and girls are not viewed as homogeneous groups, with gender usually considered in the context of ethnicity and social class. That is, studies look at which girls and which boys have weaker performance, and which ethnic groups have the largest gender differences.

In New Zealand, *ethnicity* is a key social attribute used along with other features to describe the New Zealand population. It refers to the ethnic group or groups with which people identify, or to which group they feel they belong. It is a measure of cultural affiliation as opposed to race, nationality, ancestry, or citizenship (Statistics New Zealand, 2005). Five classifications are used to describe ethnicity in New Zealand: *Maori* (the indigenous people of New Zealand); *Pasifika* (people who identify themselves culturally with the Pacific Islands); *Asian* (people who identify with west or east Asian groups); *Other* ethnic groups (people who identify as having a Middle Eastern, African, or South American background); and *Pakeha/European* (the largest grouping in New Zealand, which includes people mainly with British Isles or European heritage).

The international reporting on PIRLS 2006 showed that New Zealand's Grade 4 students' average performance in reading literacy was 532, with New Zealand students well represented among those with the strongest comprehensions skills internationally. Although New Zealand girls and boys achieved on average above their respective international means, New Zealand again recorded one of the largest gender differences in achievement, favoring girls (Mullis, Martin, Kennedy, & Foy, 2007). National-level analyses highlight the variation among New Zealand's ethnic groupings, with Pakeha/European (552) and Asian (550) students scoring on average at a much higher level than its indigenous Maori (483) and Pasifika (479) students. In terms of gender, the highest performers, on average, were Asian and Pakeha/European girls, while the weakest performers, on average, were Maori and Pasifika boys. Achievement differences favoring girls were observed between girls and boys in all but one of New Zealand's ethnic groupings; the one exception was the lack of any significant difference between the average achievement of Pasifika girls and boys (Chamberlain, in press).<sup>1</sup>

### ***Other Research***

Closely associated with the notion of reading enjoyment is engagement with the materials students read. "Students are influenced and shaped by the quality and style of curriculum delivery, the choice of content and the suitability of resources" (Crooks & Flockton, 2005, p. 58). Reading *interesting* books was one of three key factors in a case study undertaken by Cullen (2006), in which she investigated ways of increasing the reading mileage of eight New Zealand Grade 6 students who were identified as weak readers. Along with scaffolding techniques, which underpinned the success of her program, the students were given incentives to increase their mileage. Cullen herself also chose novels for them to read which had initially

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<sup>1</sup> New Zealand children were also found to be relatively positive about reading. However, about one in five students never read for fun in their own time. Boys, particularly Maori and Pasifika boys, were over-represented in this group of non-readers.

been deemed difficult (as measured by readability formulae) for this group. When asked to reflect on their own experiences in the program, the common theme to come from the students was that the texts chosen by Cullen kept them engaged because they had interesting storylines.

The Children's Reading Choices research undertaken by Coles and Hall (2002) confirmed that although reading patterns and practices were predominantly highly gendered, there were misconceptions about boys' choices of reading materials, with both girls and boys choosing fiction in preference to non-fiction material. The types of fiction books boys read included science fiction and fantasy, spy and war, and humorous fiction, while girls read comparatively more adventure, horror, and animal stories. Clark and Osborne (2007) have also looked at text types that differentiate between students' self-evaluation of either being *readers* or *non-readers*. Fiction texts differentiated the two groups, with more than 60% of readers saying they read this genre out of school compared with just 11% of non-readers. Their findings showed that a high percentage of those students who were non-readers did actually read, but their source of reading material included magazines, websites, and emails.

PIRLS in New Zealand and elsewhere is regarded as a "low stakes" assessment, in that there are no implications for individuals or individual schools. At the time of the assessment children are encouraged to do their best, and so in some respects the success of the study relies on the motivation of the participants. Eklöf (2007) has shown that Swedish students were motivated to do their best in another low-stakes international assessment, the Trends in International Mathematics and Science Study (TIMSS) 2003. However, a fundamental difference between the two international assessments is the nature of the content being assessed: reading versus mathematics and science. According to Caygill, Sturrock, and Chamberlain (2007), New Zealand Grade 4 boys are more likely than girls to enjoy learning mathematics and science. In reading it is girls more than boys who enjoy it (Chamberlain, in press). The question then arises: if the reading material is not engaging or is uninteresting to boys, how does this affect their motivation to do their best?

### ***Study Objectives***

The purpose of this research was to give an overview of New Zealand students' views of the reading passages used in the Progress in International Reading Literacy Study (PIRLS) 2006, and to examine the relationship between their views of the passages and their reading literacy achievement. In our reporting we consider their gender and their ethnicity.<sup>2</sup>

## **Methodology**

### ***Background***

The assessment framework for PIRLS 2006 was developed and described in detail by Mullis, Kennedy, Martin, and Sainsbury (2006). In brief, the study was developed around three aspects: two purposes of reading (reading for literary experience and reading for informational purposes); the processes of comprehension; and students' attitudes and beliefs about reading.

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<sup>2</sup> In keeping with our original proposal, we also investigated the passages which engaged the group of New Zealand students who found reading boring and who had reported they read for fun. Because of reasons of brevity we have not reported this part of our work.

Ten different reading texts – five literary passages and five informational passages – were used to assess the reading purposes and the processes of comprehension. The passages averaged 760 words in length, with a range of 495 to 872 words (Mullis, et al., 2007).

The five literary passages described here were complete short stories or episodes, which were accompanied by supportive illustrations.<sup>3</sup> Each story had two main characters and a plot with one or two central events.

- “A Little Lump of Clay” (*Lump of Clay*) is a story about a little lump of clay that sees itself as worthless until a girl discovers it and turns it into a cup.
- “An Unbelievable Night” (*Unbelievable Night*) is a fantasy story about a young girl who discovers one night that a crocodile appears to have escaped from her magazine.
- “Flowers on the Roof” (*Flowers on Roof*) describes how, after leaving her farm to live in the city, an elderly lady makes changes to her new home to make it like her old.
- “Fly Eagle Fly” (*Fly Eagle Fly*) a farmer raises an eagle as a chicken until the farmer’s friend encourages him to release it back into the wild.
- “Shiny Straw” (*Shiny Straw*) a young wolf, ignoring her mother’s warnings, gets caught by some hunters and only escapes after her brother sets her free, only to be caught himself.

The five informational texts described here covered a variety of content, including scientific, biographical, and procedural material. As well as prose, each text included organizational and presentational features such as diagrams, photographs, and text boxes.

- “Introducing Antarctica” (*Antarctica*) includes facts and figures about Antarctica as well as a letter from a scientist who was working at Scott Base.
- “Day Hiking” (*Day Hiking*) is a brochure which sets out a check list of what to take on a day hike, a list of safety precautions, and a map showing some hiking routes.
- “Leonardo da Vinci a Man Ahead of His Time” (*Leonardo*) includes details about his artistic works and inventions.
- “Searching for Food” (*Searching for Food*) describes three science projects on ants, pill-bugs,<sup>4</sup> and worms, which look at the features that assist them to hunt for food.
- “Sharks” (*Sharks*) is an article about the different types of sharks.

### ***Instrumentation***

Students were assigned one of 13 booklets, each with two passages: either one literary text and one informational text; two literary texts; or two informational texts. With the exception of two passages – *Unbelievable Night* and *Searching for Food* – each passage appeared in three different booklets and in different positions each time (either first or second position). The aforementioned passages were in the Reader and appeared in the order written above. The *PIRLS 2006 technical report*, edited by Martin, Mullis, and Kennedy (2007), gives a full account of the development of and procedures used in PIRLS 2006. Student ethnicity data were collected directly from the schools and corroborated by students’ self-reports via a national question included in the New Zealand Student Questionnaire.

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<sup>3</sup> An abbreviated descriptor appears in italics after the full title.

<sup>4</sup> In New Zealand, “pill-bugs” are known colloquially as “slaters”, and so this term was used in this passage.

## *Enjoyment Survey*

At the completion of the PIRLS cognitive assessment, New Zealand Grade 4 students were asked to complete a short questionnaire, referred to as the Enjoyment Survey. Each student was asked, in relation to the two texts they had read and assessed: “Did you like [name of passage]?” Students were asked to tick the box that applied, either *Yes* or *No*. In an open question they were then asked to *explain* why they liked or disliked the text.

## *Participants*

The New Zealand achieved student sample in PIRLS 2006 was 6,256, from a representative sample of 243 schools. Approximately 97% of this achieved student sample completed the Enjoyment Survey. Table 1 summarizes the number of completed responses to the Enjoyment Survey from the participants in PIRLS.

Table 1: A breakdown of the New Zealand Grade 4 sample according to test language, gender, and ethnicity

New Zealand Sub-group		New Zealand Students in PIRLS (N)	Participants Completing Enjoyment Survey <sup>a</sup>	Participants Completing Enjoyment Survey (%)
Test language	English	5,990	5,834	97
	Maori <sup>b</sup>	266	222	83
Student gender	Girls	3,051	2,979	98
	Boys	3,204	3,076	96
	Missing	1	1	100
Student ethnicity	Pakeha/European	3,627	3,559	98
	Maori	1,514	1,418	94
	Pasifika	465	456	98
	Asian	520	504	97
	Other	125	118	94
	Missing	5	1	25
Total number of respondents in PIRLS		6,256	6,056	97

*Notes:* Percentages are rounded. The composition (%) of the student sample by ethnicity was: Pakeha/European 58%; Maori 24%; Pasifika 7%; Asian 8%; and Other 2%.

a Part one or Part two of the questionnaire.

b The majority, but not all, of the children who receive instruction in the Maori language identify themselves (ethnically) as Maori. However, the majority of Maori students receive instruction in English.

## *Qualitative Analysis*

A non-hierarchical coding schedule for analyzing the students’ reasons for either liking or disliking passages was developed during the PIRLS field trial, and was, with some revisions, used for coding students’ responses to the Enjoyment Survey administered in the PIRLS main run. The same codes were used for indicating liking or disliking the passage. Seven codes, described in Table 2, were used to categorize students’ responses.

Table 2: Coding schedule used for coding students' reasons for liking or disliking the passages

Code	Description	Examples
1 – Subject Matter/Character:	Students referred to the subject matter or to a character.	“I like crocodiles” “Granny Gunn is cool” “Because I'm not a farm person”
2 – Story Construction:	Reference to aspects of the style of writing/message/moral/sub-plot.	“The story kept you guessing” “It had good adjectives” “I didn't find that it had very good plot”
3 – General Engagement	Use of adjectives to describe their opinions/impressions of a passage.	“It was unusual” “It was exciting” “It was boring” “It was childish”
4 – Level of Difficulty:	Reference to the passages (and/or questions) being easy to read or too short, or, more commonly, difficult to read or too long.	“It was too easy” “It was too long” “It was too hard to read”
5 – Educational:	Reference to the passage was educational, or the student said they learnt something (specific) from reading the passage.	“I learnt new things” “I never knew Leonard[o] invented the plane” “It had too many facts”
6 – Genre	Student referred specifically to the type of passage.	“I like action stories” “I like stories with a message” “I don't do fiction”
7 – Other	Students generally made reference to the format of the text, specifically the brochure format, or the illustrations	“There were neat illustrations” “I didn't like it because I don't usually read panflites [pamphlets]”

Note: This is a condensed version of the original schedule.

All data, PIRLS booklet information, whether or not participants liked or disliked the passage and the reasons (verbatim), and the codes assigned to the reasons were entered into an Access database.

### *Quantitative Analysis*

Students' responses to the Enjoyment Survey were aggregated across the 13 booklets in order to summarize the information for each passage without the effect of position in a given booklet. In order to achieve this, two dichotomous variables were generated: “completed passage [name]” and “liked [name]” for each of the 10 passages. The “liked [name]” variable was then included in simple cross-tabulations run by gender, ethnicity, gender and ethnicity, and test language. Chi-square tests were used to determine the association between the categorical variables and the “liked [name].” The position effect was also considered by aggregating students' views according to whether or not the passage was in first position or second position in a given booklet. The (coded) reasons given for why passages were liked (or disliked) were also aggregated across the booklets.

The relationship between student achievement and the “liked [name]” variable, by gender, was

undertaken for each passage (i.e., Rasch scores were generated).<sup>5</sup> Regression techniques were also applied to look at the effect of liking the passage, gender, position of the passage in a booklet, and the language of the test.<sup>6</sup>

### ***Data Source and Analysis Tools***

The Student Background file (ASGNZLR2) was used to source the gender (ITSEX) and test language (ITLANG) variables, and the weight variable (HOUWGT). A national variable file, NZY5EJS\_SCR, containing all raw numeric data pertaining to the Enjoyment Survey, the derived “liked [name]” variable, the ethnicity variable (SCHETHNIC), and the passage Rasch scores, was also used during the analytical work. Analyses were carried out using commercial software (SAS) using IEA custom-written SAS macros, which take into account the complex sample design, sourced from the PIRLS International Database (Foy & Kennedy, 2008).

## **Findings and Discussion**

This discussion section is divided into three parts. Firstly, a summary of whether or not students liked individual passages and the reasons why is presented. The focus of the discussion is generally on the differences and/or similarities between girls and boys. When there was clearly a difference among the ethnic groupings, or an ethnicity and gender interaction, this has also been noted. Since we were not attempting to make inferences about the New Zealand Grade 4 population, no measures of uncertainty are reported for the calculated percentages of students who endorsed the passages; the results reflect only the views of the 6,300 students involved in the study. Secondly, an overview of the effect of passage location is discussed. Finally, students’ opinions of the passages are examined in the context of their achievement.

In brief, just under two-thirds of New Zealand’s Grade 4 students reported they liked both the passages (62%) on which they were assessed. Girls, in particular Asian girls, were most likely to favorably endorse both their passages (72%); Pasifika boys were less so (53%). Proportionately more students assessed in English liked both passages (63%) than students assessed in Maori (53%). Very few students reported they did not like either passage (2%).

### ***Literary Passages***

Table 3 shows the percentage of Grade 4 students who reported that they liked a particular literary passage. The literary passage that received the highest level of endorsement from New Zealand Grade 4 students was *Unbelievable Night* (86%), followed by *Flowers on the Roof* (83%), with girls in both cases more likely to give their approval to the passage than boys. It was also apparent that for two other passages – *Lump of Clay* and *Fly Eagle Fly* – girls were more likely than boys to endorse them. The one exception was *Shiny Straw*, which attracted a slightly higher proportion of boys liking the passage (82%) than girls (80%).

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<sup>5</sup> Note that the Rasch scores are based on a relatively small number of items. The authors would like to acknowledge Oliver Neuschmidt from the IEA Data Processing Center, Hamburg, for generating these scores.

<sup>6</sup> We do not, however, report students’ views by the language (English or Maori) of the assessment in this paper.

Table 3: New Zealand Grade 4 students' reports of liking the PIRLS 2006 literary passages

New Zealand Student Group	Students Who Liked the Passage (%)				
	Lump of Clay	Flowers on the Roof	Fly Eagle Fly	Shiny Straw	Unbelievable Night
Girls	83	89	85	80	93
Boys	69	77	75	82	80
All NZ	76	83	80	81	86

Note: Number of respondents (N): Little Lump of Clay = 1,266; Flowers on the Roof = 1,284; Fly Eagle Fly = 1,243; Shiny Straw = 1,250; and Unbelievable Night = 1,214.

With two exceptions, students' views were similar regardless of their ethnicity. The exceptions were *Fly Eagle Fly*, which was liked by proportionately more Asian students (90%) (and the same percentage of boys and girls) than students from any other ethnic grouping; and *Shiny Straw*, which was more likely to be endorsed by Maori students (82%) (and the same percentage of boys and girls) than students in the other groupings.

An overview of students' reasons why they liked (or did not like) a literary passage is presented in Table 4. The reasons New Zealand students gave for liking the literary passages generally fell under the category of general engagement (i.e., the use of a particular adjective to endorse a passage). Examples of the reasons students gave for endorsing *Unbelievable Night* included "it was cool," "it was imaginative," "because it was fascinating," and "I liked the story because it was very frakey [freaky]." Students liked the humor of *Flowers on the Roof*, with "because it was funny" and "because it was interesting and grabed my attetion [grabbed my attention]" typical of responses under the general engagement category.

Table 4: Reasons given by New Zealand Grade 4 students for liking or disliking the literary passages

Category of Reason	Percentage of Grade 4 Students Reporting Yes or No, and the Reason									
	Lump of Clay		Flowers on the Roof		Fly Eagle Fly		Shiny Straw		Unbelievable Night	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Subject/Character	13	7	16	12	20	9	26	7	14	5
Story Construction	35	7	22	8	28	10	21	14	16	5
General Engagement	41	55	50	53	39	45	44	37	56	52
Difficulty	5	22	6	16	5	25	3	36	4	20
Educational	2	1	1	1	2	2	1	< 1	1	4
Genre	1	4	1	3	2	1	4	< 1	6	5
Other	3	5	3	8	3	7	3	6	4	9

Note: Because percentages are rounded to the nearest whole number, figures may appear inconsistent.

Story construction, specifically the style of writing, was a common category of reason for liking *Fly Eagle Fly*. Examples of some reasons under this category include "I liked it because I liked

the describing words” and “because it had lots of beautiful words like majestically”.

*Shiny Straw* was the only literary passage liked by proportionately more boys than girls. As well as general engagement, students - and in particular boys - liked the subject matter/character. “Because it was about wolves and my favorite animal is a wolf,” “because blue wolf reminds me of my koros [grandfather’s] dog,” and “I liked it because the carcthers wrer [characters were] cool” are typical of the types of responses under this category. A preference for one of the two main characters (e.g., “cause I liked Blue Wolf”) was also mentioned.

Reasons for liking *Lump of Clay* also fell under the story construction category, with many students making reference to the feelings it evoked or the effective vocabulary; for example, “I liked it because it tells you how a clay might feel,” “I like the story because it gives you enough detail so you can make out the story in your mind,” and “I liked it because it had lots of exprestions [expressions].”

*Little Lump of Clay* was also the literary passage with the lowest level of endorsement among New Zealand students, with nearly one-third of boys (31%) and a little under one-fifth of girls (17%) not liking the passage. This pattern held, with the exception of Pasifika students, across the ethnic groupings. The reasons presented for not liking this passage, as with the other passages, fell under the general engagement category, with “boring” the most commonly used adjective in their reasons; for example, “because it was boring and it didn’t rely [really] click me,” “because it was boring I mean who wants to listen to a boring bit of clay,” and “because it was boring story with not much excitement in it.”

### ***Informational Passages***

Table 5 shows the percentages of New Zealand Grade 4 students who endorsed each of the five informational passages. At 85%, *Antarctica* received the highest level of approval by New Zealand Grade 4 students, and was approved by girls (88%) more than by boys (81%). The highest levels of endorsement came from Pakeha/European and Maori girls (88% and 90%). *Sharks* (82%) was also viewed positively, more so among boys (87%) than girls (77%). This observation held across the ethnic groupings. Interestingly, *Leonardo* attracted the highest level of endorsement from almost all Pasifika girls (98%) and boys (86%). Pasifika girls also really enjoyed *Day Hiking* (93%), as did Asian girls (92%).

Table 5: New Zealand Grade 4 students’ reports of liking the PIRLS 2006 informational passages

NZ Student Group	Grade 4 Students Who Liked the Passage (%)				
	Antarctica	Day Hiking	Leonardo	Searching for Food	Sharks
Girls	88	84	78	72	77
Boys	81	75	81	75	87
All NZ	85	79	79	74	82

Note: Number of respondents (N): Antarctica = 1,238; Day Hiking = 1,245; Leonardo = 1,247; Searching for Food = 1,206; Sharks = 1,247.

A summary of the reasons students gave for liking the informational passages is presented in Table 6. The educational aspect of *Antarctica* was the reason most students liked this passage.

Examples of students' responses to *Antarctica* included: "I liked it because I learnt something new," and "because I didn't know some really amazing facts." Students' reasons for liking the *Sharks* passage also fell under the educational category: "Because it had information in it that I did not know," "I like gaining knowledge," and "now I can learn more about sharks teeth and what they want to eat" were typical of the type of responses students offered. The subject matter was the other reason for liking *Sharks*: "because I like sharks," "because sharks have really good abaitys [abilities]," and "because sharks are fast strong and fiarec [fierce] and also my favourite sea animal" illustrate the types of responses in this category.

Table 6: Reasons given by New Zealand Grade 4 students for liking or disliking the informational passages

Category of Reason	Percentage of Grade 4 Students Reporting Yes or No, and the Reason									
	Antarctica		Day Hiking		Leonardo		Searching for food		Sharks	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Subject/Character	14	19	32	17	33	8	16	26	27	43
Story Construction	3	2	2	1	3	2	2	1	1	1
General Engagement	21	37	25	42	26	29	28	36	15	19
Difficulty	3	18	8	26	4	45	2	19	4	27
Educational	54	12	25	7	30	7	37	8	51	7
Genre	2	8	1	3	3	5	13	6	1	2
Other	3	6	6	4	1	3	2	5	3	1

Note: Because percentages are rounded to the nearest whole number, figures may appear inconsistent.

The subject matter of *Day Hiking* (e.g., "because tramping is fun," "because I like tramping and seeing animals")<sup>7</sup> and *Leonardo* (e.g., "because I like inventions and I'm a big fan of da Vinci," "because I like envetions [inventions] and painting,") was also offered as the reason why these two passages appealed to New Zealand students.

*Searching for Food* was the informational passage that received the lowest level of endorsement from New Zealand students, regardless of gender and ethnicity. Students' reasons for liking this passage came under the general engagement category, with the adjective "interesting" typically used in their explanation (e.g., "because it was interesting," "because it was fun and it was interesting.") The reasons cited by students for why they did *not* like the passage fell under either the general engagement category (e.g., "it was boring," "because it was creepy and not that interesting") or the subject matter category (e.g., "I do not like creepy croules [creepy crawlies]," "I like science but I hate bugs," "because I'm not to big on worms and ants.")

<sup>7</sup> "Tramping" is the word commonly used in New Zealand for hiking or bush-walking.

### ***Passage Position***<sup>8</sup>

As noted in the Instrumentation section, each student was assigned one of 13 booklets, each containing two reading passages – passage 1 and passage 2. Analyses were run separately for passage 1 and passage 2 to determine whether or not the order of the passage (position 1 or position 2) had an effect on students' views. Table 7 shows the percentages of Grade 4 students who reported they liked each passage, arranged in descending order, for passage 1 and passage 2.

Table 7: Percentage of Grade 4 students reporting they like the passage, by position in booklet

First Position	Position in the Test Booklet		Students Liked Passage (%)
	Students Liked Passage (%)	Second Position	
1. Antarctica	88 (2)	1. Flowers on the Roof	84 (8)
2. <i>Unbelievable Night</i> *	86 (–)	2. Antarctica	83 (1)
3. Sharks	84 (5)	3. Fly Eagle Fly	79 (5)
4. Shiny Straw	83 (6)	4. Day Hiking	78 (7)
5. Fly Eagle Fly	83 (3)	5. Sharks	77 (3)
6. Leonardo	83 (9)	6. Shiny Straw	77 (4)
7. Day Hiking	81 (4)	7. Lump of Clay	75 (9)
8. Flowers on the Roof	81 (1)	8. <i>Searching for Food</i> <sup>†</sup>	74 (–)
9. Lump of Clay	77 (7)	9. Leonardo	73 (6)

Notes: Percentages are rounded. The figures in brackets alongside the percentages for position 1 (second column) are the rankings of the passages when in position 2. Similarly, the bracketed figures alongside the percentages for position 2 (fourth column) are the rankings of the passages when in position 1.

\**Unbelievable Night* (in first position) and <sup>†</sup>*Searching for Food* (in second position) appear only in one booklet (referred to as the Reader).

*Antarctica* was the most liked passage in position 1 and second most liked in position 2 while *Lump of Clay* was the least liked in position 1 and third least liked in position 2, just ahead of *Searching for Food* and *Leonardo*. Interestingly, *Flowers on the Roof* was the only passage with a higher percentage of liking it in position 2 of the booklet compared with position 1; all the others had decreased ratings in the second position. This may be a reflection of the other passages with which *Flowers on the Roof* was paired. For example, in booklet 1 *Flowers on the Roof* in position 2 was paired with *Little Lump of Clay* (position 1), which would suggest students compared the two texts.

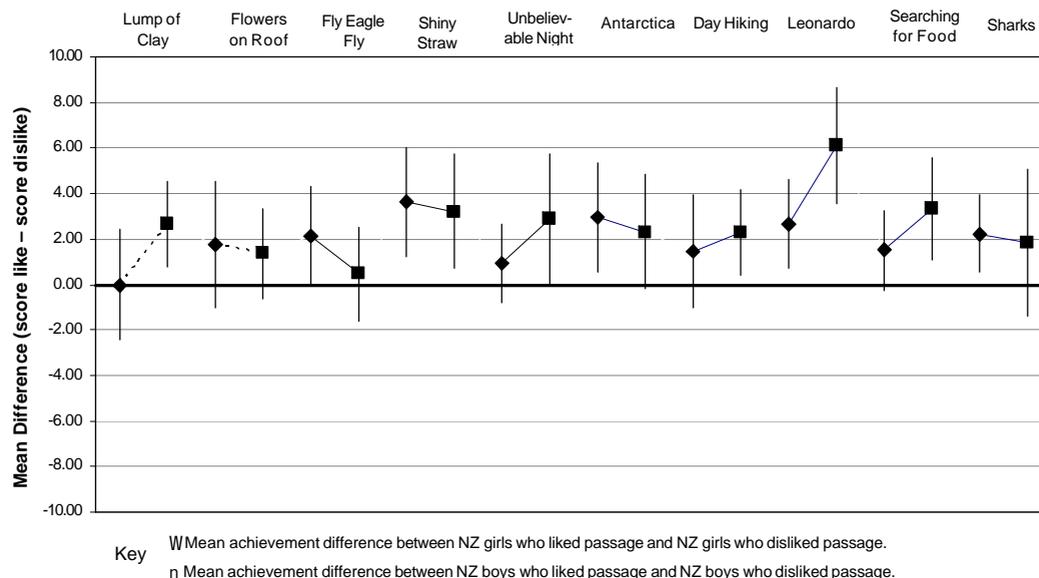
### ***Students' Views of the Passages and Their Achievement***

In this last section we examine the relationship between New Zealand students' opinions of the passages and their achievement (Rasch scores) on the passages, by gender.<sup>9</sup> Figure 1 provides a graphical representation of the average differences in achievement between students who liked

<sup>8</sup> The authors wish to acknowledge Dr Ian Schagen (Chief Research Analyst, Ministry of Education, New Zealand, formerly of the National Foundation for Educational Research, England), who undertook this piece of analysis as part of a more extensive analysis of passage position.

<sup>9</sup> For the most part our analyses showed more differences between girls' and boys' views overall and within ethnic groupings than between ethnic groupings. We therefore, focus on just gender differences in this section.

the passages and those who did not like them, by gender. On average, girls who liked the literary passage on which they were assessed achieved higher scores than girls who did not like the passage. However, the differences between their mean scores were, with one exception, small and not statistically significant (at the 5% level). The exception was *Shiny Straw*, where the average difference of 3.6 score points was statistically significant ( $t = 2.93$ ). The achievement pattern for boys was similar to that of girls, with boys who liked the literary passage achieving at a higher level, on average, than boys who reported they did not like it. However, only the average differences observed for *Little Lump of Clay* (2.6 points;  $t = 2.75$ ) and *Shiny Straw* (3.2 points;  $t = 2.50$ ) were statistically significant.



Notes: A data point with a value close to zero indicates that the difference between students who liked the passage and students who did not is *small*. The vertical lines extending from a data point show the 95% confidence interval around the difference of the mean (i.e.,  $\pm 2$  standard errors of the difference).

Figure 1: Mean achievement differences on the literary and informational passages, by gender

The figure also illustrates that achievement differences between students (both girls and boys) who either liked or disliked the informational passages were more evident than was the case for the literary passages. Significant differences between the mean scores of girls who liked and girls who did not like three of the five informational passages were detected: *Sharks* (2.3 points;  $t = 2.71$ ), *Leonardo* (2.7 points;  $t = 2.67$ ), and *Antarctica* (3.0 points;  $t = 2.45$ ). Boys who liked *Day Hiking* (2.3 points;  $t = 2.43$ ) and *Searching for Food* (3.3 points;  $t = 2.90$ ) achieved significantly higher scores on average than boys who did not like these two passages. However, it was the 6.1 (average) point difference between the boys who liked *Leonardo* and the boys who did not which was so marked ( $t = 4.74$ ).

In order to confirm the relationships shown between achievement, gender and liking the passage, two multiple regression models were built. The regressions were run separately for the literary and informational passages, using the Rasch passage score as the outcome variable. The independent variables were various combinations of gender, liking the passage, position variables, and the language of the test. For the resulting “literary” model, significant  $\beta$  coefficients ( $p < 0.05$ ) were found for the variables: [assessed in Maori], [boys], [liked the passage], [boys\*position 2], and [boys\*position 2\*liked passage]. As well as boys and students

assessed in Maori tending to have lower scores, the model demonstrated that students who liked the passage were likely to have higher scores. Achievement on the second passage was likely to be lower for boys than for girls, although this effect was negated if boys liked the second passage. A slightly different pattern was observed for the “informational” model: [assessed in Maori], [boys], [liked the passage], [Leonardo\*liked\*boys] were the only variables with significant  $\beta$  coefficients. Boys and students assessed in Maori tended to have lower scores on the informational passages, while liking had a positive effect on achievement particularly for those boys who liked the passage, and especially, if they liked *Leonardo*.

In keeping with our approach at looking at the individual passages, simple models were built for each passage. The outcome variable in each case was the Rasch passage score. The independent variables were: [liked passage], [assessed in Maori], [boy liked passage], [position 2], and [<ethnic boy>] where <ethnic boy> took the value of “boy” in each ethnic grouping. The standardized coefficients for these regressions are reported in Table 8.

Table 8: Significant (standardized) coefficients for regression equations for each of the passages

Passage	Literary Passages					Informational Passages				
	L of C	F on R	F E F	S S	U N <sup>a</sup>	A	D H	L	S	S f F <sup>b</sup>
N	1218	1241	1205	1211	1165	1193	1197	1213	1192	1149
$\beta_1$ [Liked Passage]			2.1 (1.0)*	3.5 (1.2)**		3.3 (1.1)**		2.9 (1.0)**	2.4 (0.8)**	
$\beta_2$ [Assess in Maori]	-14.9 (1.5)**	-12.1 (1.2)**	-9.9 (1.3)**	-12.9 (1.3)**	-15.2 (2.5)**	-13.0 (1.8)**	-10.9 (1.2)**	-10.5 (1.4)**	-11.7 (1.4)**	-10.4 (2.7)**
$\beta_3$ [Boy Liked Passage]								3.6 (1.6)*		
$\beta_4$ [Position 2]	-1.1 (0.5)*				N.A.	-1.3 (0.7)*		1.5 (0.7)*		N.A.
$\beta_5$ [Pakeha Boy]								-2.9 (1.4)*		
$\beta_6$ [Maori Boy]	-7.5 (1.3)**	-7.7 (1.6)**	-4.6 (1.5)**	-5.5 (1.5)**	-6.5 (1.9)**	-4.5 (1.5)**	-7.1 (1.5)**	-8.9 (1.5)**	-3.9 (1.7)*	-7.8 (1.4)**
$\beta_7$ [Pasifika Boy]	-11.3 (2.0)**	-8.7 (2.0)**	-6.6 (1.8)**	-6.6 (2.0)**	-5.6 (1.9)**	-5.3 (1.9)**	-9.8 (2.0)**	-10.2 (2.4)**	-5.7 (2.0)**	-5.1 (2.1)*
$\beta_8$ [Asian Boy]	-3.2 (1.6)*	-4.9 (1.9)**								
R <sup>2</sup>	0.127	0.128	0.09	0.108	0.087	0.108	0.109	0.121	0.074	0.081

Notes: Standard errors appear in parentheses.

a Appeared in position 1 in the Reader and b appeared in position 2 in the Reader.

N.A. Not used in model.

\* $p < 0.05$ ; \*\* $p < 0.01$

The significant (negative)  $\beta$  coefficients common to all passage models were the variables [assessed in Maori], [being a Maori boy], and [being a Pasifika boy]. In addition, the  $\beta$  coefficient for the [liked passage] was significant (and positive) in the models for *Fly Eagle Fly*, *Shiny Straw*, *Antarctica*, *Leonardo*, and *Sharks*. Interestingly, significant (negative) passage position effects on student achievement were observed for *Lump of Clay* and *Antarctica*, and consistent with the finding from the “informational model” described previously, there were significant positive effects of passage position and being a boy who liked *Leonardo*.

## Conclusion and Implications

New Zealand students were on the whole very positive about the PIRLS 2006 reading passages, with almost all students reporting they liked at least one of the passages. The fantasy passage *Unbelievable Night* and the informational passage *Antarctica*<sup>10</sup> received the most endorsement, while *Little Lump of Clay* and *Searching for Food* were the least endorsed. The reasons most often given by students for liking the literary passages generally fell into the overarching category of general engagement. Students' reasons for liking the information passages mainly fell into three categories: educational, general engagement, and subject matter. Not surprisingly, there were differences between girls' and boys' views. *Unbelievable Night* was found to be the most popular among New Zealand girls, while *Sharks* appeared to be the most popular among boys. For some passages, there were small effects of liking the passage on student achievement. Furthermore, there did appear to be some position effect on achievement for some passages, and more so for boys. It is unlikely however that these findings would explain entirely New Zealand's relatively large gender difference shown in PIRLS.

### *Implications*

There are two main implications. Firstly, the findings reinforce the passage rotation practice already adhered to by the international research team. However, during the development phase for the next cycle of PIRLS there are opportunities (for example, in the field trial) to use the findings from this research to determine if there is any potential bias or lack of engagement with particular passages, and if so, how that could be alleviated across booklets, and particularly the Reader. Particular attention could also be paid to the positioning of any engagement question, with the placement at the end of the reading passage (and before the set questions relating to the passage), rather than at the end of the assessment.

Secondly, there are interesting results here for New Zealand classroom teachers in terms of identifying types of materials that will engage our reluctant readers or non-readers (see footnote 10). If reading for enjoyment is one of the key levers for improving the skills of weaker readers, which in New Zealand's case are often boys, then having evidence of what engages these students is essential. As was noted by the New Zealand Ministry of Education (2003, p. 12), "Effective practice involves using and creating rich texts. These relate to students' interests, draw on and affirm their social and cultural identities, use authentic language, and motivate and challenge them as learners."

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<sup>10</sup> An examination of the children's views of the passages in relation to those who reported that they never read for fun showed that these students also tended to hold less favorable views about the passages. *Flowers on the Roof*, *Unbelievable Night*, and *Antarctica* featured as popular passages among New Zealand's non-readers.

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