

TESTING TAMARIKI: HOW SUITABLE IS THE PPVT-
III?

A thesis submitted in partial fulfilment of the requirements for the
Degree

of Master of Arts in Psychology

in the University of Canterbury

by Tracy N. Haitana

University of Canterbury

2007

TABLE OF CONTENTS

Acknowledgments	x
Abstract	xi
Glossary	xii
1. Introduction	1
1.1 Te Tiriti o Waitangi	3
1.2 He Korowai Oranga	5
1.3 Ethnicity Data	6
1.4 Māori Health Disparities	8
1.5 Mental Health Statistics	10
1.6 Child Health Statistics	15
1.7 Māori Education Statistics	17
1.8 Māori Children and Reading Development	19
1.9 Psychometric Theory and Test Development	21
1.9.1 True Score Test Theory	21
1.9.2 Reliability	22
1.9.3 Validity	24
1.9.4 Item Analysis and Differential Item Functioning	25
1.9.5 Cultural Bias	26
1.10 Māori and Standardised Testing	27
1.11 Peabody Picture Vocabulary Test-III	35
1.12 Dynamic Assessment	39
1.13 Kaupapa Māori Research	42
1.14 Summary/Conclusions	46

1.15	Research Hypothesis/Aims	47
2.	Method.....	50
2.1	Participants.....	50
2.1.1	Inclusion Criteria.....	50
2.1.2	Recruitment of Research Participants	51
2.2	Materials and Apparatus	54
2.2.1	Peabody Picture Vocabulary Test – III	54
2.2.2	Test Environment.....	56
2.2.3	Additional Test Materials	57
2.3	Procedure	57
2.3.1	Ethics Approval.....	57
2.3.2	Initial Community Consultation: Prevalence of PPVT-III Use.....	57
2.3.3	Community Consultation: Initial Research Hui with Māori Community	58
2.3.4	Pilot Testing.....	59
2.3.5	Interview and Consent Process: Parents and Children.....	59
2.3.6	PPVT-III Testing.....	61
2.3.7	Administration of PPVT-III with Māori Children	62
2.3.8	Final Consultation: Feedback to Key Māori Stakeholders.....	64
2.3.9	Dissemination of Research Findings.....	65
2.4	Analysis.....	66
2.4.1	Quantitative Data	66
2.4.2	Qualitative Data	67
2.4.3	Data Integrity	70
3.	Results.....	71

3.1	Demographic Information.....	71
3.1.1	Developmental History.....	72
3.1.2	Iwi Representation	76
3.1.3	Ethnicity.....	77
3.1.4	Age Group Sample Characteristics	78
3.1.5	Mainstream and Māori -Medium School Sample Characteristics	79
3.2	Standard Score Comparison.....	80
3.2.1	Descriptive Data.....	80
3.3	Comparative Analysis.....	81
3.3.1	Overall Results.....	81
3.3.2	Comparison by Age Group.....	82
3.3.3	Comparison by Gender.....	84
3.3.4	Comparison by School Decile	86
3.3.5	Comparison of Participants With/Without Hearing Impairment.....	87
3.3.6	Comparison by School Type.....	87
3.4	Error Analysis	88
3.4.1	Overall Error Percentage and Rate.....	89
3.4.2	Error Percentage and Rate by Age Group	90
3.4.3	Error Percentage and Rate by Gender	95
3.4.4	Error Percentage and Rate by School Type.....	97
3.5	Participant Responses to Re-administered Correct Stimulus.....	100
3.5.1	Response Codes	100
3.5.2	Results of Participant Responses to Correct Stimulus	103
3.5.3	Responses to Correct Stimulus by Age Group	103

3.5.4	Responses to Correct Stimulus by Gender	104
3.5.5	Responses to Correct Stimulus by School Type	105
3.6	Qualitative Error Descriptions	106
3.7	Participant Impressions of the PPVT-III	108
3.7.1	Negative Features of the PPVT-III	108
3.7.2	Positive Features of the PPVT-III.....	111
3.7.3	Relevance of PPVT-III Pictures.....	112
4.	Discussion	114
4.1	Introduction	114
4.2	Standard Score Comparison.....	115
4.2.1	Developmental Age Groups	115
4.2.2	Gender	116
4.2.3	School Decile	118
4.2.4	Standardised Norm Group	119
4.2.5	School Type	119
4.3	Administration with Māori Children	121
4.3.1	Administration with Māori-Medium Participants.....	122
4.4	Error Analysis	124
4.4.1	Adjustments to Culturally Biased Items.....	125
4.4.2	Responses to Re-administered Items.....	129
4.5	Implications of the Research Results.....	131
4.6	Limitations of the Research	131
4.7	Future Research.....	134
4.8	Conclusions and Recommendations.....	135

5.	References.....	138
6.	Appendices.....	148
6.1	Appendix A: Participant Screening Measure	149
6.2	Appendix B: Scoping Survey.....	150
6.3	Appendix C: General Information Form.....	152
6.4	Appendix D: Recruitment Dialogue	154
6.5	Appendix E: Informed Consent Form	155
6.6	Appendix F: Developmental Survey	156
6.7	Appendix G: Child Information Form.....	158
6.8	Appendix H: Child Assent Form.....	160
6.9	Appendix I: Test Administration Procedure	161
6.10	Appendix J: Community Feedback Report.....	162

LIST OF FIGURES

Figure 1: Distribution of standard scores obtained by all participants (N=46).....	81
Figure 2: 2X2 ANOVA comparing standard scores by age group and school type, reveals a significant main effect for school type, and no significant age group difference or interaction effect.....	84
Figure 3: 2X2 ANOVA comparing standard scores by gender and school type. Reveals a significant main effect for school type, and no significant gender difference or interaction effect.....	86
Figure 4: Error rate on all PPVT-III test items by participants presented with each item.....	90
Figure 5a: Error rate on PPVT-III test items made by participants in the 5-6 year age group ...	92
Figure 5b: Error rate on PPVT-III test items made by participants in the 7-8 year age group ...	93
Figure 5c: Error rate on PPVT-III test items made by participants in the 9-10 year age group.....	93
Figure 6: Error rate on PPVT-III test items made by male (n=24) and female (n=22) participants.....	95
Figure 7: Error rate on PPVT-III test items made by participants attending mainstream and Māori-medium schools	98
Figure 8: Responses made on re-administered PPVT-III items by participants 5-6 years (n=16), 7-8 years (n=16), 9-10 years (n=14)	104
Figure 9: Responses made on re-administered PPVT-III items by male (n=24) and female (n=22) participants	105
Figure 10: Responses made on re-administered PPVT-III items by mainstream (n=33) and Māori-medium school participants (n=13)	106

LIST OF TABLES

Table 1. Characteristics of Research Participants.....	53
Table 2: Recruitment Methods used to Locate Final Research Participants.....	54
Table 3: Age at Which Participants Achieved Developmental Milestones.	74
Table 4: Type of Early Childhood Education Service Attended by Participants.	76
Table 5: Iwi Affiliations Identified by Participants.	77
Table 6: Ethnic Identity of Participants	78
Table 7. Characteristics of Participants Attending Mainstream and Māori-Medium Schools....	80
Table 8: Descriptive Statistics Outlining Participants’ Performance on PPVT-III.	80
Table 9: Factorial ANOVA Comparing Average Standard Scores Obtained on PPVT-III by 5-6, 7-8, 9-10 Year Participants Attending Mainstream or Māori-Medium Schools	84
Table 10: Factorial ANOVA Comparing Average Standard Scores Obtained on PPVT-III by Male and Female Participants Attending Mainstream or Māori-Medium Schools ...	85
Table 11: ANOVA Comparing Average Standard Scores Obtained on PPVT-III by Participants Attending Low, Mid, and High Decile Schools.....	87
Table 12: Most Common Errors Made by all Participants on the PPVT-III.....	90
Table 13: Most Common Errors Made by Participants in Each Age Group on the PPVT-III....	91
Table 14: Descriptive Statistics Outlining PPVT-III Basal and Ceiling Points by Age Group.....	92
Table 15: Descriptive Statistics Outlining PPVT-III Basal and Ceiling Points by Gender	96
Table 16: Most Common Errors Made by Mainstream and Māori-Medium School Children on the PPVT-III.....	98
Table 17: Descriptive Statistics Outlining PPVT-III Basal and Ceiling Points by School Type.....	99

Table 18: Error Analysis for Participants Attending Māori-Medium Schools (n=13)	100
Table 19: Analysis of Items with High Error Rates or Patterns Made by Participants who were Presented with the Items Attending Both Mainstream (n=33) and Māori- Medium Schools (n=13)	100
Table 20: Qualitative Information Provided by Participants when asked to Identify Previously Incorrect Target Items from the PPVT-III	107

Acknowledgments

Firstly, thank you so much to all of the key Māori stakeholders, tamariki and their whānau who placed their trust in me, and supported the kaupapa of this research. Your valuable contribution has allowed this thesis to be written.

Thank you to those people who have mentored and supported me emotionally and financially over the years of my tertiary training through your friendship, employment, supervision, continued encouragement, and the provision of various scholarships and grants. Without your help, this work would not have been completed the way that it has. Kia ora.

Finally, from the bottom of my heart, thank you to my whānau and friends for your tireless support and aroha. Kempton, we made it my boy!

Abstract

In New Zealand, Māori currently experience the “poorest health status of any ethnic group” characterised by high rates of physical and mental illness, educational underachievement, unemployment, criminal incarceration, and low socioeconomic status (Durie, 1998; Ministry of Health, 1999, 2002a, p. 2). Despite attempts to reduce the disparities between Māori and other New Zealanders, Māori continue to have a lower life expectancy than non-Māori (Durie, 1998; Reid, 1999). Māori children show similar levels of disadvantage experiencing high rates of illness and preventable death (Ministry of Health, 1998). Māori children also achieve poorly in educational settings, with literacy levels and overall involvement in education found to be below that of non-Māori (Ministry of Education, 2003a). Research findings have identified that health and educational disparities may be explained in part, by a mismatch between current approaches to practice and service delivery, and the values, beliefs, and experiences of Māori (Phillips, McNaughton, & MacDonald, 2004). In line with such findings, a number of standardised psychometric tests developed outside of New Zealand, have also been found to produce culturally biased results when used with Māori (Ogden, 2003; Ogden & McFarlane-Nathan, 1997). The Peabody Picture Vocabulary Test (PPVT-III) is one such test which is currently used in New Zealand to measure receptive vocabulary skills (Stockman, 2000). This research investigated the suitability of the PPVT-III with 46 Māori children from three different age groups. Results revealed that the PPVT-III appeared to be suitable for use with Māori, although a number of suggestions were made as to ways in which the administration and interpretation of PPVT-III test scores could be adjusted when working with Māori. Additional research is required to establish whether changes to culturally biased items may improve the validity of the PPVT-III for use with Māori.

Glossary

Aotearoa: New Zealand.

Hapū: Sub-tribe.

Hauora Māori: Māori health.

He Korowai Oranga: Translates to mean literally ‘the cloak of wellness’. He Korowai Oranga is also the name of the Māori Health Strategy developed by the New Zealand Ministry of Health.

Hōmai te Waiora ki Ahau: A standardised tool currently being developed as a Māori measure of wellbeing.

Hua Oranga: A tool designed by the Ministry of Health to provide a measure of Māori mental health outcomes.

Hui: A meeting forum.

Iwi: One's tribe or tribal groups to which a person has genealogical links.

Kainga: Home, dwelling, village, place of residence.

Kaupapa Māori Research: A methodological framework that is used to guide research in order to ensure that Māori values, beliefs, and experiences are prioritised and protected throughout the research process.

Koha: A gift/contribution/offering given in acknowledgement or recognition of others. Also given as an act of reciprocity.

Kura Kaupapa Māori: A Māori immersion school for children aged between 5-18 years where Māori philosophy, language, and practices underpin all educational experiences.

Mana: Authority, control, influence, prestige, power.

Marae: The whole land (inclusive of lands, ancestral houses, and facilities) that has ancestral and genealogical relevance to its descendants. The land establishes a place for descendants of an iwi/hapū to stand.

Plunket/Well Child Book: Plunket is a New Zealand service that provides assistance to families with children less than five years of age. Plunket or Well Child books are record books which are typically used to record information about individual children and developmental milestones.

Tamariki: Child or children.

Tangata Whenua: Used to refer to Māori, the indigenous people. People of the land.

Taonga: Treasures. Can refer to tangible things such as land or objects of significance as well as intangible things such as knowledge and wellbeing.

Te Ao Māori me te ao Pākehā: The Māori and Pākehā world.

Te Kōhanga Reo: Māori language nest. A total immersion Māori language programme for preschool aged children that is underpinned by Māori philosophy and practices.

Te Whare Tapa Wha: A Māori model of health that encompasses the four cornerstones of wellbeing/health: taha wairua (spiritual dimension); taha tinana (physical dimension); taha hinengaro (emotional dimension); and taha whānau (family dimension). Te Whare Tapa Wha is based on the metaphor of a house, needing four strong walls to ensure stability and wellbeing. Often referred to as the four cornerstones of health.

Te Reo: The language. Commonly used to refer to the Māori language.

Te Hoe Nuku Roa: Standardised tool developed as a measure of Māori cultural identity through the use of cultural indicators such as: self identification as Māori; whakapapa; marae participation; whānau associations; whenua tipu; contact with Māori people; and Māori language.

Te Tiriti o Waitangi: The Treaty of Waitangi.

Tino Rangatiratanga: Self determination, independence, chieftainship.

Whakapapa: Genealogy.

Whakatātaka: Whakatātaka is the process of weaving together strands called whenu or aho to form a pattern and eventually become a taonga such as a korowai. Whakatātaka is also the name of the Māori Health Action Plan developed by the New Zealand Ministry of Health, which describes the actions that need to be implemented in order to achieve the aims of He Korowai Oranga.

Whakawhanaunga: Relationships, affiliations, interactions.

Whānau: Global term that can refer to family structure, and/or support networks as identified by the participant and their parents.

Whānau ora: A term used extensively in He Korowai Oranga, meaning for whānau to achieve the fullness of health and wellbeing within te ao Māori and New Zealand society as a whole.

Whenua: Earth, homeland, land.

Whenua Tipu: Ancestral land.

1. Introduction

In Aotearoa, a Māori child born today faces a challenging future ahead. According to current statistics, Māori people experience disproportionately higher rates of mental illness, poorer health, socio-economic disadvantage, criminal incarceration, educational underachievement, and unemployment when compared to non-Māori (Durie, 1998; Dyllal et al., 1999; Hirini, Flett, & Long, 2005; O'Connor & Macfarlane, 2002; Ogden & McFarlane-Nathan, 1997; Phillips et al., 2004; Pihama, Cram, & Walker, 2002; Shepherd & Leathem, 1999; Westerveld & Gillon, 2001). A recent national report shows that Māori continue to have a lower life expectancy than non-Māori despite advancements in medicine and overall living standards, with Māori reported to have the “poorest health status of any ethnic group in New Zealand” (Ministry of Health, 1999, 2002a, p. 2).

Attempts have been made to improve the ability of various services and systems to respond to the needs of Māori in order to reduce the disparities that currently exist in New Zealand. This thesis focuses on the specific issue of providing responsive services to Māori by considering the practice of using psychometric tests with Māori children that were developed and standardised in other countries. Given that assessment results are often used

to guide treatment, collecting reliable and valid information is essential in order to improve treatment outcomes for Māori. If the assessment measure itself has not been validated for use with Māori, this brings into question the accuracy of the information that is used to guide treatment. In this study, one test, the Peabody Picture Vocabulary Test III (PPVT-III), will be used with three different age groups of Māori children to investigate the suitability of the tool when used with tamariki.

Central to this thesis is a commitment to conducting research in a manner that recognises, prioritises, and values Māori beliefs, practices and experiences, with the ultimate aim of producing research that will benefit the wider Māori community. As such, a Kaupapa Māori Research framework will be used to guide this study from the stage of inception through to the interpretation and dissemination of results.

In the section that follows, evidence will be presented regarding the pertinent issues that affect the overall health status of Māori in New Zealand. In particular, literature reviewed will include reference to Te Tiriti o Waitangi, and the implications arising from the Treaty in relation to health disparities currently experienced by Māori. Literature presented will then outline the importance of Māori Health Policy and the accurate collection of ethnicity

data, before providing an overview of the disparities facing Māori in the areas of health, mental health, and education. Given the focus of this thesis, attention will be paid to discussing the theory behind psychometric test development, and the use of standardised tests, including the PPVT-III, with Māori and other ethnic minority groups. Finally, the methods and merits of Kaupapa Māori Research will be discussed, along with the aims and hypotheses of the study.

1.1 Te Tiriti o Waitangi

The plight of Māori health sits within a historical and contextual reality, which has direct implications and relevance to this discussion. Historians suggest that the Treaty arose as an attempt to appease the concerns of humanitarian groups, with the ultimate aim being to assimilate Māori rather than preserve traditional Māori values, beliefs, and practices (Orange, 1987). However, Māori scholars point out that the Treaty of Waitangi was developed in part, as a response to Crown and Ministerial concerns about the rates of poor health and death amongst Māori people who, at the time, had no resistance to newly introduced infectious diseases (Durie, 1998; Orange, 1987; Reid, 1999a, 1999b; Tipene-Leach, 1998). When the Treaty was signed in 1840, the protection of Māori health and wellbeing was seen as a

clear motivational factor, and provision for health was included in Articles Two and Three of the Treaty (Durie, 1998; Reid, 1999b).

It is now well known that numerous discrepancies exist between the English and Māori text of the Treaty of Waitangi (Orange, 1987). However, the Treaty is a legal document, and as such is subject to the contra-proferentum principle, which states that any interpretation required between texts will be taken from the indigenous text (Reid, 1999b). In New Zealand, the Waitangi Tribunal is required by law to consider both Māori and English versions of the Treaty (Reid, 1999b). According to the English translation of the Māori text, Article Two relates to the protection of Māori in the exercise of chieftainship (tino rangatiratanga) over their lands (whenua), villages (kainga), and all of their treasures (taonga) (Durie, 1998). According to Māori understandings of the word taonga, Article Two is to include health, with the promise of Crown protection of the health of Māori people (Durie, 1998; Reid, 1999b).

Article Three, which has more obvious connotations for health, affords Māori people the same rights and privileges as British subjects (Durie, 1998). According to this Article, Māori were promised equality in all areas including health, which would be equal to that experienced by British

subjects. However, in New Zealand today this ‘equality’ is rarely witnessed (Ministry of Health & University of Otago, 2006). As already mentioned, Māori people continue to experience disparities in most areas of health, and are yet to encounter the promised health status enjoyed by other New Zealanders (Durie, 1998; Reid, 1999).

1.2 He Korowai Oranga

Charged with the responsibility of improving the health status of Māori and reducing current disparities in health is the Māori health strategy, He Korowai Oranga (Ministry of Health, 2002a). He Korowai Oranga aims to improve Māori health outcomes under the auspices of the Treaty of Waitangi, in particular by adherence to the principles of the Treaty. With reference to He Korowai Oranga, the principles include a commitment to partnership with Māori, participation of Māori at all levels of service delivery, and protection of Māori cultural values and practices in order to achieve equal health outcomes (Ministry of Health, 2002a). He Korowai Oranga acknowledges and recognises the need to prioritise Māori beliefs, values, and practices in the delivery of effective health care, with the ultimate goal being to achieve whānau ora (Ministry of Health, 2002a). Whakatātaka bridges the gap between policy and service delivery by clearly delineating responsibilities for service provision, and providing measures to

ensure that the health outcomes outlined in He Korowai Oranga are achieved (Ministry of Health, 2002c).

1.3 Ethnicity Data

The collection of accurate ethnicity data is an essential component of service planning and delivery across the health sector, and as such, is one of the key objectives of policies such as He Korowai Oranga (Ministry of Health, 2002a, 2004). According to health researchers, “a commitment to eliminating ethnic health disparities requires a commitment to improving ethnicity data quality”, in that accurate ethnicity data provides a sound base from which evidence regarding health status and disparity can be formulated (Blakely, Robson, & Woodward, 2002, p. 149).

In New Zealand, changes to the census ethnicity question and unreliable collection of ethnicity data in health records have resulted in a significant undercounting of Māori mortality, making it difficult to monitor health outcomes for Māori (Ajwani, Blakely, Robson, Atkinson, & Kiro, 2003; Blakely, Kiro, & Woodward, 2002; Blakely, Robson, Atkinson, Sporle, & Kiro, 2002; Blakely, Robson, & Woodward, 2002; Reid, 1999a). The New Zealand Census-Mortality Study investigated the extent of undercounting of Māori and Pacific mortality figures, attributing the substantial underestimate

to a numerator-denominator bias (Ajwani et al., 2003; Blakely, Kiro et al., 2002; Blakely, Robson, Atkinson et al., 2002; Blakely, Robson, & Woodward, 2002). In response to this finding, the Ministry of Health developed a set of guidelines to improve the quality of ethnicity data, by standardising the way in which data would be collected and recorded (Ministry of Health, 2004).

The Ministry of Health protocols advocate for a standardised approach to ethnicity data collection through consistent use of the 2001 census ethnicity question, allowing for continued comparisons to be made between the health sector and census datasets, resulting in improved health statistics (Ministry of Health, 2004). In accordance with Ministry protocols, ethnicity is defined as “the ethnic group or groups that people identify with or feel they belong to” (Ministry of Health, 2004, p. 5). When collecting information regarding the ethnicity of children, Ministry protocols recommend that parents be given the opportunity to respond to the 2001 census ethnicity question on their child’s behalf (Ministry of Health, 2004). This focus on self-identification moves away from race based definitions, where group affiliation was determined based on blood quantum rather than a person’s lived realities (Ministry of Health, 2004). This process of self-identification

is deemed to be more valid and meaningful in that it allows Māori to define themselves, rather than be defined by others.

1.4 Māori Health Disparities

According to available health statistics, Māori are found to be affected by heart disease, stroke, lung cancer, diabetes, and road traffic injuries more frequently than non-Māori, with incidence, prevalence, and mortality rates between 50 to 100 percent higher amongst Māori (Ministry of Health, 1999). The leading cause of hospital admissions in 1992 for Māori males (aged 15-24 years) was motor vehicle accidents, which was also the leading cause of death in this age-group between 1989-1991 (Ogden & McFarlane-Nathan, 1997). Engagement in high contact sports (such as rugby), violence, and alcohol-related hospital admissions were also higher in this group in comparison to non-Māori (Ogden & McFarlane-Nathan, 1997).

These and other disparities have been extensively documented throughout the research literature, and as a result, attempts to ‘close the gaps’ and reduce the growing health disparities between Māori and non-Māori have received increased attention at both service and policy levels (Grigg & Macrae, 2000; Ministry of Health, 1999; Ministry of Health & University of Otago, 2006). Contributing to poor health outcomes for Māori is the pervasive experience

of disadvantage across a range of health indicators, including lower levels of income, poorer educational attainment, poorer housing, higher rates of unemployment, involvement in criminal activity, and higher rates of accidents and injuries (Shepherd & Leathem, 1999). While health disparities are apparent amongst other ethnic groups, health inequalities in New Zealand are greatest between Māori and people of New Zealand European descent (Harris et al., 2006; Ministry of Health & University of Otago, 2006).

In an attempt to improve the quality of health care delivery to Māori, the Medical Council of New Zealand issued a statement outlining best practice guidelines when working with Māori patients and their whānau (Medical Council of New Zealand, 2006). The Medical Council acknowledges the importance of meeting the needs of Māori patients, due to their position as tangata whenua, and also to address the number of disparities experienced by Māori in relation to health (Medical Council of New Zealand, 2006).

The role of culture is considered to be an important determinant of health, in that Māori views of health and wellbeing, approaches to accessing health care, and responses to health interventions are mediated by culture (Medical Council of New Zealand, 2006). This position is further supported by the finding that health disparities between Māori and non-Māori persist despite

controlling for socio-economic factors such as poverty and education level, and factors that restrict access to services such as residing in a rural location (Medical Council of New Zealand, 2006; Ministry of Health & University of Otago, 2006).

Therefore, the Medical Council has emphasised the need for doctors to adjust their practice when working with Māori patients and their whānau in order to improve Māori health outcomes. Considerable emphasis has been placed on providing responsive care to Māori patients in acknowledgement of the flow on effect of poor health care and negative outcomes. The experiences of individual Māori patients also effects whānau, and future generations of Māori through negative perceptions of health care services and the impact that this has on health seeking behaviour (Medical Council of New Zealand, 2006).

1.5 Mental Health Statistics

When considering the issue of mental health, Māori are again found to be disadvantaged. A review of hospital admissions to mental health services found that Māori accessed crisis outpatient, acute inpatient, and forensic services at a higher rate than non-Māori, with a large number of admissions relating to alcohol and drug problems (Durie, 1999b). Re-admission rates to

mental health services were also higher amongst Māori, a figure which may be influenced by high levels of co-morbidity, or the tendency for Māori to be referred to services later and with more acute symptoms (Durie, 1999b). Research also showed that Māori demonstrated a different pattern of admission and discharge to mental health services than non-Māori due to high rates of involvement with various social, economic, and political systems (Dyall et al., 1999). Statistics show that one third of Māori were admitted to a mental health agency without choice, an experience that limits a person's ability to choose or control the direction of their own mental health (Baxter, Kingi, Tapsell, & Durie, 2006; Dyall et al., 1999).

Māori experience disproportionately higher rates of unemployment and are over-represented in criminal statistics, with this being linked to the disruption brought about through colonisation, increased urbanisation and loss of cultural traditions and practices (O'Connor & Macfarlane, 2002). Among prison inmates, Māori make up over 40% of the prison population despite comprising close to 15% of the general population (O'Connor & Macfarlane, 2002). While the risk of suicide is greater within prison settings in general, Māori have higher rates of suicide than non-Māori within these settings and in the community (Beautrais, Wells, McGee, & Oakley Browne, 2006; Deane, Skogstad, & Williams, 1999). Research investigating help

seeking behaviour amongst male prison inmates found that Māori inmates were less likely to seek help for psychological distress than New Zealand European inmates (Deane et al., 1999).

Community based research found that Māori in both urban and rural areas have experienced a high frequency of exposure to traumatic events, and found a tentative link between exposure to trauma, and subsequent mental or physical illness (Hirini et al., 2005). Research investigating the characteristics of mental health consumers showed that Māori consumers tended to have more severe illnesses, and demonstrated greater functional impairments than non-Māori despite experiencing similar levels of socio-economic deprivation (Baxter et al., 2006). Rates of treatment seeking in primary healthcare settings was found to be no different between Māori and non-Māori patients, although Māori patients demonstrated higher rates of mental illness and greater symptom severity than non-Māori patients. Again, these findings persisted despite controlling for age and socioeconomic factors (Baxter et al., 2006).

Despite attempts by psychological training programmes and mental health services to improve service delivery and responsiveness to Māori, there is still much that could be done (Glover & Robertson, 1997; Ihimaera &

Tassell, 2004; Johnstone & Read, 2000). A recent questionnaire designed to capture psychiatrists perspectives of Māori mental health revealed that most psychiatrists felt their training had not prepared them to work effectively with Māori clients (Johnstone & Read, 2000). In order to improve training and service delivery so as to meet the needs of Māori, Psychiatrists recognised the need to increase their knowledge of Hauora Māori perspectives, while simultaneously increasing the number of Māori health professionals and dedicated services (Johnstone & Read, 2000).

In terms of current service provision, efforts to address the needs of Māori clients have varied from service to service. These range from programme ‘add-ons’, where cultural components are integrated into existing mainstream programmes or services, to partnership approaches where Māori and non-Māori work alongside each other in order to utilise each others’ strengths (Glover & Robertson, 1997; Ihimaera & Tassell, 2004; Johnstone & Read, 2000). More recent additions have incorporated Kaupapa Māori principles in the move towards tino rangatiratanga, where services are run by Māori and for Māori (Glover & Robertson, 1997).

In line with the Medical Council position, psychologists and psychology programmes in New Zealand are required to address the greater mental

health needs of Māori, so as to meet their Treaty obligations (Levy, 2002). In order to facilitate mental wellbeing amongst Māori, priority has been given to encourage and support more Māori students to embark on a career in the field of psychology (Ihimaera & Tassell, 2004; Levy, 2002). While research shows that Māori are over-represented in most mental health client populations, they are at the same time under-represented as health professionals (Durie, 1999a; Johnstone & Read, 2000; Levy, 2002; Ponga, Maxwell-Crawford, Ihimaera, & Emery, 2004).

The benefits of increasing the number of Māori professionals working in the area of health is clear, with Māori clients found to show improved access to services, increased engagement with providers, and more positive health outcomes in ‘by Māori for Māori’ services (Durie, 1998, 2001; Hirini, 1997; Huriwai, Sellman, Sullivan, & Potiki, 2000; Johnstone & Read, 2000; Ministry of Health, 2002a; Ngata & Pomare, 1992; Reid, 1999a; Simpson & Tapsell, 1999; Wright, 1997). While the aim of continued workforce development is important, consideration must also be given to supporting existing and new Māori staff due to the dual roles and difficulties that may arise for Māori training within a discipline that at times may conflict with their own beliefs, values, and practices (Glover & Robertson, 1997; Levy, 2002). In order to increase Māori participation in professions such as

psychology, work must continue to systematically address the barriers that restrict Māori involvement and retention in the health workforce (Levy, 2002).

1.6 Child Health Statistics

Due to the widespread difficulties experienced by Māori adults and youth, it is not surprising that Māori children are similarly affected. National health statistics show that Māori children are 83% more likely to die before the age of 15 years than non-Māori children (Ministry of Health, 1998). This high rate of premature death in Māori children can be largely attributed to preventable causes (Ministry of Health, 1998). These include injury, poisoning, road traffic accidents, SIDS, respiratory conditions, and infectious diseases such as meningitis (Baker, Martin, Kieft, Jones, & Lennon, 1999; Ministry of Health, 1998; Mitchell & Thompson, 2001; Mitchell et al., 1997; Murphy, White, & Morreau, 2002).

Hospital admission rates were also found to be higher amongst Māori children, particularly in those less than five years of age (Ministry of Health, 1998). Other conditions affecting the health and development of disproportionate numbers of Māori children include glue ear, hearing impairments, asthma, poor oral health, and obesity (Giles & Asher, 1991;

Ministry of Health, 1998; Thomson, Williams, Dennison, & Peacock, 2002; Tyrrell et al., 2001). Although the overall health status of all children is said to have improved in New Zealand, Māori children still experience poorer health in comparison to non-Māori children (Ministry of Health, 1998, 2002a).

Suicidal behaviour among children and adolescents in New Zealand is increasing, with Māori youth found to have the highest rates of death by suicide in young people aged less than 15 years (Beautrais, 2001). Despite higher rates of hospitalisation for mental health issues amongst Māori adults, research suggests that Māori children and young people show lower levels of access to specialist mental health services (Baxter et al., 2006). This finding may provide some explanation for the high suicide rate in Māori youth, while accounting for increased mental health crisis intervention among Māori adults (Baxter et al., 2006). According to recent statistics, most suicides among Māori occur prior to the age of 35 years (Ministry of Health, 2006b). Researchers have identified a number of key risks associated with increased suicidal behaviour including individual, psychological, educational, and socio-cultural factors (Beautrais et al., 2006). Given the high rates of adversity experienced by Māori children, either directly, or through wider whānau adversity, these figures are not surprising.

1.7 Māori Education Statistics

While inequalities experienced by Māori in the areas of health and mental health have been widely documented, educational attainment is also seen as an influential determinant of health (Howden-Chapman & Tobias, 2000).

The relationship between health and education is thought to be mediated by numerous factors, including increased access to health-related information in educational settings, and indirectly through benefits arising from improved employment and income prospects (Howden-Chapman & Tobias, 2000).

When considering levels of participation and achievement in educational settings, Māori children were again found to experience inequalities.

According to national data, Māori preschoolers were found to attend early childhood services at lower rates than children from other ethnic groups, a finding which is shown to predict poorer school adjustment and reduced readiness for school based learning (Ministry of Education, 2003b; Ministry of Health, 1998; Phillips et al., 2004; Zaslow, Oldham, Moore, & Magenheim, 1998). In line with this finding, more than one third of Māori secondary school students left school without any formal qualifications, while only 16% were found to obtain any type of Year 13 qualification (Ministry of Education, 2003a, 2003b).

Although Māori participation at tertiary education levels is improving, far fewer Māori young people participate in tertiary training than non-Māori young people, with Māori also being less likely to complete postgraduate qualifications (Ministry of Education, 2003a). As highlighted by one author, Māori have been identified as having difficulties in educational achievement despite attending the same schools, and in many cases speaking the same language as non-Māori children (Phillips et al., 2004; Shepherd & Leathem, 1999).

A number of initiatives have arisen in response to the longstanding disparities between Māori and non-Māori in terms of educational outcomes. While the Native Schools System was primarily established with the intention of 'Europeanising' and assimilating Māori children, in many cases what evolved was an approach to education that responded to the needs of Māori communities (Simon & Smith, 2001). Te Kōhanga Reo and Kura Kaupapa Māori have surpassed this work, by placing educational aspirations back into the hands of Māori (Simon & Smith, 2001). While still in the early stages of its development, Kōhanga and Kura differ from past educational initiatives in that Māori philosophy and practices are at the forefront (Bishop, Berryman, & Richardson, 2001; Rau, 2001; Simon & Smith, 2001).

1.8 Māori Children and Reading Development

In terms of specific areas of discrepancy, national data shows that Māori children consistently score below non-Māori children, particularly on reading related tasks (Westerveld & Gillon, 2001). Similar studies have found that even after controlling for socio-economic status, these inequalities remained, with Māori children shown to perform significantly worse than non-Māori children on tasks that drew on phonological awareness knowledge (Phillips et al., 2004; Westerveld & Gillon, 2001). In one study assessing oral language skills, no significant differences were observed between Māori and non-Māori children, although minor differences were found to exist between the types of inferential skills used in oral language tasks (Westerveld & Gillon, 2001). It was suggested that this inferential skill difference may have a cumulative effect over time, resulting in poorer reading performance amongst older Māori children as the demands of reading and comprehension become greater (Westerveld & Gillon, 2001).

This phenomenon is not a new one, with reports showing that since the 1930s, Māori children's educational achievement in mainstream schools has consistently lagged behind that of non-Māori children (Phillips et al., 2004). This finding suggests that educational best-practice does not, and is yet to meet the needs of indigenous children in New Zealand or abroad according

to national and international literature (Phillips et al., 2004). A number of reasons have been proposed for this disparity between Māori and non-Māori, including different levels of phonological knowledge and awareness, and confusion arising from a mismatch between family literacy experiences and those expected at school (Phillips et al., 2004). In order to instigate change, Phillips et al. (2004, p. 310) proposed that effective literacy instruction should be culturally appropriate and strengths focused aiming to build on “the development of the learner’s knowledge and ways of acting within the activities that build on these practices”.

Kaupapa Māori researchers point out the need to avoid comparisons between Māori-medium and English-medium education, due to the difference in practices and underlying pedagogy (Bishop et al., 2001). According to these researchers, this type of comparison only reinforces the expectation that Kura Kaupapa should be defined by mainstream models, and is a misunderstanding of the Kaupapa Māori framework which seeks to prioritise and validate Māori values, beliefs and practices (Bishop et al., 2001).

Continued comparisons to mainstream education systems, which are in a much later stage of development and are supported by majority culture status, view Kura Kaupapa from a disparities perspective by assuming that mainstream education systems ‘have it right’ when it comes to Māori

education despite evidence to the contrary (Bishop et al., 2001; Phillips et al., 2004). Successful development of oral language skills among Māori-medium learners has been linked to early exposure and access to te reo Māori, and is associated with greater subsequent success in reading and writing literacy (McNaughton, MacDonald, Barber, Farry, & Woodard, 2006).

1.9 Psychometric Theory and Test Development

While psychometric tests offer great promise in terms of providing a means to assess, identify, and measure various educational and psychological constructs, they are far from being infallible. In order to understand the many factors that may influence the accuracy of psychometric test results, it is necessary to first provide an overview of the theory that underpins psychometric test development.

1.9.1 True Score Test Theory

When developing a tool to measure psychological and educational constructs, two principles provide the basis for test development (Palmer, 2005; Sattler, 2001). The first principle relates to ‘normality’, and assumes that scores on a given test will fall within a normal or bell-shaped distribution (Palmer, 2005). While most people obtain scores that cluster

around a given centre point or mean fewer people obtain scores that are further above or below this point. Test developers typically utilise large, representative groups of people when constructing a test in order to provide a standardised norm group from which to compare individual test scores. Comparing an individual score with the standardisation mean provides an indication of a person's relative standing in relation to the performance of the wider norm group (Palmer, 2005; Sattler, 2001).

The second principle underpinning *true score test theory* assumes that every score obtained on a test contains components of a person's 'true score' as well as random error, which affects the reliability of psychometric measurement (Palmer, 2005; Sattler, 2001). Psychometric tests aim to minimise sources of error so as to increase the reliability of a test.

1.9.2 Reliability

Reliability relates to the consistency, or accuracy of a test under different conditions (Sattler, 2001). According to *true score test theory*, the reliability of a test can be quantified by calculating the amount of error present in a given measure (Palmer, 2005). Five main methods are commonly used in psychometric test development to calculate the reliability of a test by

measuring the amount of error present in scores obtained by participants from the standardised norm group (Palmer, 2005).

Reliability can be calculated by comparing the stability of an individual's score over time (*test-retest reliability*), the consistency of a score as rated by two independent observers (*inter-rater reliability*), and the similarity between an individual's score obtained on two alternate forms of the same test (*alternate form/parallel form reliability*) (Palmer, 2005; Sattler, 2001). In addition, reliability can also be calculated by considering the *internal consistency* of scores obtained on one administration of a test, by either splitting the test into two halves and comparing the scores of each half (*split-half reliability*), or by comparing the correlations between scores obtained on similar items within a test (Palmer, 2005; Sattler, 2001). For a psychometric test to be of use, it must be reliable in order to provide stable, consistent, and dependable measurement of a given construct.

While test developers are able to provide an indication of a test's reliability by reporting the performance of the standardised norm group, this does not guarantee reliability for every individual completing that test thereafter (Sattler, 2001). Factors potentially affecting the reliability of individual test scores include: examinee characteristics such as cultural background,

emotional lability, language, and motivation; examiner characteristics such as cultural background, inexperience, and incorrect administration; situational factors such as noise, temperature, and timing of assessment; and test item characteristics such as unfamiliar or culturally bound items, items with multiple meanings, or items with rigid scoring criteria (Sattler, 2001). All of these factors may introduce elements of bias into psychometric assessment, affecting the reliability of test results.

1.9.3 Validity

Validity relates to the degree to which a test is able to measure the construct or ability that it intends to measure, or the extent to which test scores are ‘correct’ and free from bias (Palmer, 2005; Sattler, 2001). As with reliability, a range of methods are used by test developers to provide evidence for the validity of psychometric tests. *Content validity* is achieved by ensuring that the items included in a test relate to the construct that is being measured; *criterion-related validity* measures the extent to which scores on a given test are related to another criterion or outcome measure; and *construct validity* provides a gauge as to the degree to which a psychological construct or trait is measured by a test (Sattler, 2001). The validity of a test can be affected by a range of factors including examinee characteristics, with the pre-condition for validity being reliability (Sattler,

2001). Therefore, if a test does not meet the conditions of reliability, it can not be deemed a valid measure.

1.9.4 Item Analysis and Differential Item Functioning

A critical feature of reliable and valid psychometric tests is the inclusion of test items which reflect the constructs that they attempt to measure in an appropriate manner (Palmer, 2005). In some tests, items are included in a hierarchical fashion with the intention of reflecting increasingly difficult content as the test progresses. As with reliability and validity, test developers attempt to gauge the extent to which individual test items function effectively in a given test by analysing the performance of the norm group on each test item (Palmer, 2005; Sattler, 2001). While differential item functioning may not be apparent when administering a test with participants that resemble the norm group, problems may arise when individuals from different cultural backgrounds are presented with the same test items (Sattler, 2001; Solarsh & Alant, 2006; Stockman, 2000). As tests typically draw on local samples to validate a test which is comprised of local expressions of a given construct, issues of cultural bias may not be apparent until the test is applied elsewhere (Sattler, 2001; Stockman, 2000).

1.9.5 Cultural Bias

Issues of cultural bias in psychometric assessment have been widely debated in the research literature, with a range of views arising as to the ways in which cultural differences might compromise the validity of psychometric test results (Ogden, 2003; Ogden & McFarlane-Nathan, 1997; Qi, Kaiser, Milan, Yzquierdo, & Hancock, 2003; Restrepo et al., 2006; Sattler, 2001; Shepherd & Leathem, 1999; Solarsh & Alant, 2006; Stockman, 2000; Washington & Craig, 1999). Despite the continued debate about the effects of cultural bias, most professionals acknowledge that test content and administration procedures are invariably culturally bound, with some tests having a higher cultural loading and potential for bias than others (Ogden, 2003; Ogden & McFarlane-Nathan, 1997; Sattler, 2001; Solarsh & Alant, 2006). Test developers acknowledge the need to consider the impact of test content, test materials and test conditions on the reliability and validity of a test in an attempt to minimise the effects of cultural bias (Solarsh & Alant, 2006).

In assessing the suitability of a test for use with people from different cultural backgrounds, a range of criteria can be considered. Firstly, a test can be judged as unbiased if the distribution of scores obtained by different groups are normally distributed, with similar means and standard deviations

obtained by all groups (Stockman, 2000). Secondly, a test can be judged as unbiased based on the accuracy with which it is able to distinguish between people with clinical or educational needs, regardless of their cultural backgrounds (Stockman, 2000). Finally, unbiased measures assess skills and constructs that reflect the experiences of all people equally well, allowing sound conclusions to be drawn from the test results. In an unbiased measure, high or low scores reflect attributes of the person being assessed and cannot be seen as artefacts arising from culturally different understandings of the test material (Stockman, 2000).

1.10 Māori and Standardised Testing

The need to consider issues of cultural bias also applies to standardised testing in New Zealand, although at present only limited research has been conducted in this area, especially in relation to children. Two studies which measured the suitability of tests commonly used for neurological assessment purposes found that a number of these tests were culturally biased when used with Māori (Ogden, 2003; Ogden & McFarlane-Nathan, 1997). In both studies, Māori participants were found to score significantly worse than the standardised groups on tests which favoured culturally grounded knowledge and learning experiences (Ogden, 2003; Ogden & McFarlane-Nathan, 1997). Research utilising standardised assessment measures often acknowledge the

possible effects of bias given that most tests have not been validated for use with a New Zealand sample; however, few suggestions are made as to how results should be interpreted to ameliorate cultural bias (Bryson & Hosken, 2005; Harris et al., 2006).

One study reporting on the use of psychometric assessment with New Zealand adolescents was the Youth 2000 Survey, a project that aimed to explore the health and wellbeing of young people throughout Aotearoa (Walker et al., 2005). As part of this research project, questions from the Reynold's Adolescent Depression Scale (RADS) were presented to an ethnically diverse group of New Zealand youth as a means of assessing depressive symptoms (Walker et al., 2005). Analyses revealed that the RADS had acceptable levels of reliability and validity across all of the ethnic groups sampled, including Māori youth, with the authors subsequently deducing that it was an appropriate measure to be used with New Zealand adolescents (Walker et al., 2005).

The Short Form Health Survey (SF-36) is another psychometric questionnaire used extensively with Māori to measure health related quality of life (Palmer, 2004; Scott, Sarfati, Tobias, & Haslett, 2000). It was discovered that the SF-36 was producing culturally biased results when

administered to Māori participants, a finding that was attributed to the mismatch between the dualistic notion of health measured by the SF-36, and the holistic view of health understood by many Māori (Scott et al., 2000). Other psychometrics found to be culturally biased when used with Māori included the Symptom Checklist – 90 – Revised Scale (SCL-90-R), which was designed to measure psychopathology, and the Profile of Mood States (POMS), a tool designed to measure mood (Barker-Collo, 2003).

Standardised assessment tools are also widely used in forensic settings, where they are commonly employed to identify inmates that may require rehabilitative input (Maynard, 1999). Assessment measures used with New Zealand inmates were, up until recently, based on western frameworks and experiences of offending, and did not consider the unique factors that might impact on offending behaviour among Māori (Maynard, 1999). Department of Corrections staff have worked to address this issue by developing a range of tools designed to meet the needs of Māori.

One such measure, the Māori Culture-Related Needs (MaCRNs), was developed for use in conjunction with the Criminogenic Needs Inventory (CNI) (Maynard, 1999). This tool was designed to assess cultural identity, cultural tension, whānau, and whakawhanaunga, and the ways in which these

factors may support, or inhibit criminal behaviour (Maynard, 1999). This measure has yet to be standardised statistically, however the aim was to enable the provision of tailored interventions for Māori inmates based on the needs indicated by the MaCRNs (Maynard, 1999). Further efforts by the Department of Corrections have seen the development of a Framework for Reducing Māori Offending (FReMO), which aims to assist with the provision of culturally responsive services within the Justice setting (McFarlane-Nathan, 1999).

Bryson and Hosken (2005) discussed the ethical obligations of Industrial and Organisational psychologists to practice in a way that is culturally competent and that demonstrates respect for the dignity of all people and persons in Aotearoa. They highlighted the need to consider the possibility of bias in psychometric assessment measures and tools, particularly when working with Māori clients. In addition, Bryson and Hosken (2005) also acknowledged the possibility that some tests may not accurately reflect the true ability of Māori job candidates given their focus on largely western definitions of skill and ability. While efforts to address cultural bias are admirable, simple understandings of cultural bias are probably not enough.

Therefore, it is important to consider:

“...issues of test bias, test fairness, and cultural equivalence that may impact the validity of psychometric instruments... when applied to people from different cultural backgrounds” (Bryson & Hosken, 2005, p. 74).

What appears to be common practice, particularly in research settings, is to utilise mainstream psychometrics with all participants regardless of their ethnicity, and to either acknowledge the possibility of cultural bias, or to make adjustments to the tool itself in order to meet the needs of the research. In one study, researchers administered a range of psychometric assessment measures with Māori to assess exposure to traumatic events, physical health, and psychological health (Hirini et al., 2005). Tools used included the Traumatic Stress Schedule, the Checklist of Serious Medical Conditions, the Pennebaker Inventory of Limbic Languidness (measure of current physical symptoms of illness), and the short version of the Civilian Mississippi Scale (Hirini et al., 2005).

Despite the issue of cultural bias, the utility of standardised assessment measures have been recognised by Māori, who in some cases, have sought to develop tools designed to capture and measure Māori concepts (Palmer, 2005). One such measure, known as Te Hoe Nuku Roa, aims to provide information pertaining to Māori cultural identity (Stevenson, 2004). While

this measure could be seen by some as imposing boundaries or restricting membership to Māori culture, it was developed to gauge the extent to which Māori were involved or had access to a range of different cultural indicators. These indicators included: self identification as Māori, “whakapapa, marae participation, whānau associations (extended family), whenua tipu (ancestral land), contact with Māori people, and Māori language” (Stevenson, 2004, p. 37). Initial findings suggested the need to differentially weight the degree to which each indicator (Māori identity, whakapapa, marae participation, whānau associations, whenua tipu, contact with Māori people, and Māori language) contributed to the overall measure of cultural identity, with some indicators thought to carry more weight than others. While initial findings show promise, further research is required in order to establish the degree to which Te Hoe Nuku Roa is a reliable, and valid measure of Māori cultural identity (Stevenson, 2004).

Hōmai te Waiora ki Ahau is a Māori measure of wellbeing that is currently being developed to provide an alternative to tools such as the SF-36 (Palmer, 2004). In contrast to non-Māori concepts of wellness, Hōmai te Waiora ki Ahau is consistent with Māori world views, informed by Māori models of wellbeing, and encompasses an administrative approach making it suitable for use with respondents regardless of their level of te reo (Palmer, 2004).

Initial pilot testing shows promising results with regards to the construct validity of the tool, and the utility of a measure that encapsulates the concept of wellbeing and Hauora Māori (Palmer, 2004). Interest has also been shown in the development of Hua Oranga, a tool designed as a Māori measure of mental health outcomes (Ministry of Health, 2002b).

As the aspirations of Māori language regeneration become realised through the continued development of Māori-medium schools, so too does the need to develop measures that are capable of assessing the literacy progress of te reo Māori students (Bishop et al., 2001; Crombie, Houia, & Reedy, 2000; McNaughton et al., 2006; Rau, 2001). Developing a test of Māori language proficiency is a difficult task given the broad and often varied language backgrounds of children upon entry to Māori-medium schools (Bishop et al., 2001; Crombie et al., 2000; McNaughton et al., 2006; Rau, 2001).

Additional challenges facing test developers have included the need to align measures with the New Zealand Curriculum Framework, which in some cases has resulted in the direct translation of existing measures from English to Māori despite differences in underlying pedagogy (Bishop et al., 2001). Several frameworks and tools have been developed and profiled in various research projects in an attempt to provide assessment measures and techniques that are responsive to the different needs of Māori-medium

learners and programmes (Bishop et al., 2001; Crombie et al., 2000; McNaughton et al., 2006; Rau, 2001).

In addition to utilising Māori concepts for the purpose of assessment, researchers have also considered the benefits of using Māori frameworks to deliver treatment programmes to Māori (Glover, 2005). Te Whare Tapa Wha, a contemporary Māori paradigm has been considered as a framework to analyse and potentially reduce smoking behaviour amongst Māori. While acknowledging the importance of general smoking cessation components, this article provided insight into the ways in which smoking cessation programmes could target the “spiritual and cultural factors unique to Māori that encourage and support Māori smoking” (Glover, 2005, p. 17).

The issue of using potentially biased tools and processes with Māori poses a serious question of validity in terms of assessment and treatment. The Health Research Council of New Zealand has prioritised the need to develop culturally appropriate tools for use with Māori in order to ensure that mental health services are able to respond appropriately to the needs of Māori clients and their whānau (Dyall et al., 1999). The issue of administering psychometric tests with Māori children raises similar concerns with regards to validity (Hohepa & McNaughton, 1993). Western research perspectives

have been criticised for comparing ethnic minority children to standards and norms that are not derived from descriptions or data that is relevant to them (Crombie et al., 2000; Hohepa & McNaughton, 1993; McCloskey & Athanasiou, 2000; Saenz & Huer, 2003). Through the continued use of standardised assessment measures that have not been validated for use with Māori, the risk remains that the child will be mistakenly perceived as deficient rather than the tool itself (Hohepa & McNaughton, 1993).

1.11 Peabody Picture Vocabulary Test-III

At present, Māori remain underrepresented in the field of psychology, meaning that for many whānau, requesting a Māori psychologist will not be an option that is readily available to them (Levy, 2002). Also, while work continues towards the development of psychometric tools that measure Māori values and concepts, most assessment measures currently used with Māori will have been developed in countries outside of New Zealand.

The Peabody Picture Vocabulary Test (PPVT-III) is one psychometric tool that was designed and standardised for use with children in the United States, but is used in New Zealand with Māori children both clinically, and in research (Phillips et al., 2004; Reese & Read, 2000). The latest version of the Peabody Picture Vocabulary Test, the PPVT-III, is purported to be a

culturally valid test due to the inclusion of a large representative group of ethnic minority children within the wider norm group (Stockman, 2000; Washington & Craig, 1999). Despite this seemingly well-intentioned move to reduce any previously existing cultural bias, some researchers argue that the mere inclusion of an ethnic minority norm group does not render a test unbiased (Bryson & Hosken, 2005; Hohepa & McNaughton, 1993; Laing & Kamhi, 2003; McCloskey & Athanasiou, 2000; Saenz & Huer, 2003; Stockman, 2000; Tzuriel, 2000). In order for a test to be considered unbiased, it must also measure culturally appropriate knowledge and utilise methods of testing suitable for people from different cultural backgrounds (Palmer, 2004).

In New Zealand a number of researchers have made use of the PPVT-III as a measure of verbal knowledge and receptive vocabulary development in children (Phillips et al., 2004; Reese & Cox, 1999; Reese & Read, 2000).

Although not standardised for use in New Zealand, the PPVT-III was chosen as a research tool because of its widespread usage in similar studies and its position as a well known test of emergent language (Phillips et al., 2004).

One researcher, who measured the reliability of the PPVT-III for use amongst a mixed ethnicity sample of New Zealand children, found that the test-retest reliability of the PPVT-III closely matched that reported by the

American norm reference group (Reese & Read, 2000). This finding led the researchers to conclude that the PPVT-III was a useful instrument for measuring language ability in children from multiple ethnic and economic backgrounds (Reese & Read, 2000).

In another similar study, the PPVT-III was used as a baseline and post-intervention measure of receptive language skills with a sample that included a large proportion of Māori children (Phillips et al., 2004). Again this study assumed that the PPVT-III provided a valid measure of oral vocabulary skills in Māori children, attributing the difference found between pre and post intervention scores on the PPVT-III to the success of the intervention (Phillips et al., 2004). Given the accepted use of the PPVT-III in New Zealand, it seems important to assess whether it is a suitable test to be used with Māori children.

Research investigating the assessment of American children for school readiness found that an earlier version of the PPVT, the PPVT-R, produced different results for White American and African American kindergarten aged children (Rock & Stenner, 2005). The results showed that African American first grade children tested with the PPVT-R obtained scores which suggested that they had approximately half the vocabulary of White

American first grade children. Additional criticisms of the PPVT-R suggested that this psychometric produced the greatest variation of responses between national samples when testing children of the same age, and that larger school readiness gaps were found between African American and White American children than was found by other psychometrics (Rock & Stenner, 2005). The discrepancy between African American and White American children's scores on the PPVT-R remained close to one standard deviation apart, even after controlling for factors such as SES, parental education, and low birth weight (Rock & Stenner, 2005).

Despite these criticisms, the PPVT-R was also used as a measure of cognitive development with a sample of Mexican American children (Padilla, Boardman, Hummer, & Espitia, 2002). Although the researchers acknowledged that past studies had found evidence of cultural bias among ethnic minority groups through decreased PPVT-R test scores, these findings were attributed to small sample sizes and confounding factors such as socio-economic deprivation (Padilla et al., 2002). As a result, the PPVT-R was deemed to be suitable for use with Mexican American children, with a Spanish translation of the test thought to overcome any potential biases that may influence test results (Padilla et al., 2002).

In current research outlining the suitability of the PPVT-III, gender differences from the standardisation sample were not reported by test developers in the technical manual (Restrepo et al., 2006). Despite this finding, research results from other studies have been mixed, with most reporting no significant gender differences – although where scores for male and female participants have been reported, female participants tended to score higher than male participants (Washington & Craig, 1999). In gauging the suitability of the PPVT-III for use with an at-risk sample of African American children, Washington and Craig (1999) found that their scores on the PPVT-III did not significantly differ from the norm group. As a result of this finding, they concluded that the PPVT-III represents a valid and culturally fair test suitable for use with African American children (Washington & Craig, 1999). On review of the available literature it was apparent that limited research has been conducted in order to systematically investigate the use of the PPVT-III with people from diverse cultural backgrounds.

1.12 Dynamic Assessment

In an attempt to reduce the effects of bias when working with ethnic minority children, international researchers have advocated for the use of more dynamic or alternative approaches to standardised assessment methods

(Laing & Kamhi, 2003; McCloskey & Athanasiou, 2000; Saenz & Huer, 2003; Solarsh & Alant, 2006; Tzuriel, 2000). According to these authors, while most psychometric tests include ethnic minority children in the standardisation sample, the percentage of children included tends to reflect that of the wider population group (Laing & Kamhi, 2003; McCloskey & Athanasiou, 2000; Saenz & Huer, 2003). As a result, unless separate norms are provided for ethnic minority children, standard scores tend to reflect those obtained by the majority group (Saenz & Huer, 2003). Further compounding this problem is the issue of content bias, in that many standardised tests incorporate test stimuli and administrative methods which favour concepts and practices reflective of mainstream culture (Laing & Kamhi, 2003; Solarsh & Alant, 2006). Therefore, when interpreting test results obtained by ethnic minority children, it is difficult to ascertain whether poor performance might be due to true deficits, or differences in familial, cultural, and linguistic experiences (Laing & Kamhi, 2003; Solarsh & Alant, 2006).

A range of alternative assessment methods and adjustments have been suggested in order to improve the suitability of standardised tests for use with ethnic minority children (Laing & Kamhi, 2003; McCloskey & Athanasiou, 2000; Saenz & Huer, 2003; Solarsh & Alant, 2006; Tzuriel,

2000). Such techniques include renorming tests for different ethnic minority groups, modifying a test through translation of words and concepts, using non-standardised measures such as parent/teacher reports or curriculum based assessments, and through adjustments to standardised administration procedures – commonly referred to as dynamic assessment (Laing & Kamhi, 2003; McCloskey & Athanasiou, 2000; Saenz & Huer, 2003; Washington & Craig, 1999). While offering an alternative to standardised assessment methods, each of these adjustments has disadvantages ranging from reliability and validity problems to increasing demands on clinical time and resources (Saenz & Huer, 2003).

According to international literature, dynamic assessment methods offer particular promise when assessing the language abilities of ethnically diverse and bilingual children (Laing & Kamhi, 2003; McCloskey & Athanasiou, 2000; Saenz & Huer, 2003; Solarsh & Alant, 2006; Tzuriel, 2000). A dynamic approach to assessment includes a range of techniques, all of which aim to assess the extent to which a child can learn to respond correctly once they have had sufficient teaching and exposure to test items (Saenz & Huer, 2003). Specific techniques include the *Test-Teach-Retest* approach, where a baseline measure is gathered, followed by a period of direct instruction on tasks, techniques, problems, and concepts similar to those being assessed

(Saenz & Huer, 2003). Retesting reveals the extent to which the child's skills and exposure to similar tasks has improved their test performance (Saenz & Huer, 2003). *Task or Stimulus Variability* is another dynamic assessment approach, in which aspects of the test are adapted to reflect the child's strengths or life experiences, for example through the use of props, or by assessing the child's skills in more naturalistic settings (Saenz & Huer, 2003). *Graduated Prompting* is also used, and involves offering increased levels of assistance on individual items (e.g. starting from minor assistance moving to more direct instruction) as required throughout the assessment process (Saenz & Huer, 2003). Elements reflective of dynamic techniques have also been used successfully in low decile New Zealand schools to improve literacy achievement among Māori children, providing evidence for the potential of dynamic assessment approaches when working with Māori (Phillips et al., 2004).

1.13 Kaupapa Māori Research

Kaupapa Māori Research (KMR) has arisen in response to a history of Māori being researched 'on' rather than 'with', whereby Māori were defined according to the views of the dominant culture that did not always understand or portray Māori favourably (Keefe et al., 1999; Smith, 1999b). As a result, research and researchers continue to be viewed with suspicion by

Māori communities who have, for all intensive purposes, been ‘over-researched’ but have experienced little in the way of beneficial research outcomes (Keefe et al., 1999; Smith, 1999b). KMR is not in itself a method, rather it is a methodological approach or framework that is used to guide research in a way that prioritises, values, and protects Māori knowledge and ways of being (Smith, 1999a, 1999b).

The parameters of what constitutes Kaupapa Māori principles are broadly defined, with no step-wise approach suggested for conducting KMR. Kaupapa Māori principles are applied to areas outside of research, and have been described as political responses to three key arguments (Smith, 1999a, 1999b). The first relates to the issue of decolonisation and, within research settings, can be conceptualised as Māori posing, initiating, and facilitating their own research questions, and conducting their own research projects in order to produce positive outcomes for Māori research participants (Smith, 1999b). The second argument relates to the Treaty of Waitangi, and asserts that Māori have equal rights as Treaty partners to decide on pertinent research questions, and to subsequently prioritise allocation of funding for research and policy development that will benefit Māori (Smith, 1999b). The third point relates to Kaupapa, whereby Māori values and practices are

inherent to the research itself, and provide guidelines as to how to proceed and what approaches or methods to use (Smith, 1999b).

Māori theorists have described a number of approaches to undertaking Kaupapa Māori Research; however, there appears to be several central elements of KMR that are consistently endorsed throughout the literature (Keefe et al., 1999; Smith, 1999b). While debate continues as to what role, if any, non-Māori researchers may play in KMR, the involvement of Māori researchers who identify as Māori and have a Māori worldview is seen as an essential component of KMR (Smith, 1999b). Related to this is the positioning of KMR as means of realising tino rangatiratanga, by enabling Māori to initiate and direct research that is capable of addressing issues of importance to Māori (Smith, 1999b).

In KMR, the concepts of whānau and identity are inextricably linked, in that Māori researchers often undertake research with, and for other Māori whom they may share close affiliations with (Keefe et al., 1999; Smith, 1999b).

Working with whānau also reduces the barriers between researchers and research participants. While facilitating access to the Māori community, whānau connections increase opportunities for the community to critique or debate the relevance of research questions, and ultimately increases the level

of accountability of the researcher back to the Māori community (Keefe et al., 1999; Smith, 1999b). KMR goes beyond cultural sensitivity by interweaving research techniques throughout Māori processes in order to ensure that the research is culturally safe for the researcher, participant(s) and their community (Smith, 1999b).

For the purposes of this research, the KMR principles utilised will be in fitting with the approach adopted by the Māori/Indigenous Health Institute in various research projects (Pitama et al., 2003; Robertson, 2005; Robertson et al., 2005). Adherence to these principles will ensure the following research outcomes:

- Ongoing accountability and input from key Māori stakeholders;
- Māori Principal investigators who are skilled and guided by methodologies that collect, analyse, and present data in a culturally responsive way;
- That the research team has expertise within Māori health and that the process of research contributes to developing the Māori research workforce;
- That any additional methodological approaches used will privilege indigenous experiences and validate Māori knowledge and paradigms;

- That the mana of all participants will be acknowledged and maintained throughout the research process;
- That all data and analysis will be relayed to key stakeholders for feedback to ensure that data is correctly interpreted, and where agreement is not met, that this is made explicit in any subsequent discussion and reporting of results;
- That the community from where the knowledge is derived receive feedback on the research results using appropriate mediums, and in a way that supports them to utilise the data as they see fit.

1.14 Summary/Conclusions

In conclusion, this chapter has highlighted the following points:

- Māori of all ages experience disproportionately higher rates of adversity in areas such as health, mental health, and education regardless of their age or socio-economic standing.
- The Treaty of Waitangi guarantees to Māori the same rights and privileges as non-Māori, and the protection of all of their treasures including health, however this obligation has not been met.
- In order to address the disparity that exists between Māori and non-Māori, there is a need to provide resources and services that are capable

of responding to the values, beliefs, and experiences of Māori and their whānau.

- While psychometric assessment tools provide valuable information to assist with responding to a number of issues, few tools have been validated for use with Māori.
- Despite increased acknowledgement and prioritisation of Māori needs in areas such as health, mental health, and education, the ability to respond to the needs of Māori by providing access to Māori health professionals, assessment methods that are based on Māori concepts, tailored interventions, and Kaupapa Māori services continues to be limited.

While progress continues towards the development and provision of services tailored specifically to meet the needs of Māori, work must also be done to improve current practices. Therefore, this research project will investigate the suitability of using one psychometric test, the PPVT-III, with Māori children.

1.15 Research Hypothesis/Aims

The purpose of this study is to investigate the appropriateness of using the PPVT-III by administering the test with three age groups of Māori children.

As current literature suggests, over time inferential skill differences may lead

to poorer reading performance amongst older Māori children. Therefore it was hypothesised that there would be a significant difference between the standard scores obtained by children from each of the three age groups. In accordance with current literature, it was hypothesised that younger Māori children would obtain higher scores on the PPVT-III than older Māori children. In addition to this hypothesis, the key objectives within the research were as follows:

1. To investigate the appropriateness of using the PPVT-III as a measure of oral language with Māori children;
2. To investigate the extent to which Māori children of different age groups obtain different scores on the PPVT-III;
3. To compare the scores of Māori children with those obtained by the standardised norm group;
4. To ascertain the level of comfort and engagement experienced by Māori children when tested with the PPVT-III;
5. To identify which particular PPVT-III test items Māori children found difficult and provide some explanation as to why they found them difficult;
6. To identify which particular PPVT-III test items Māori children found easy and provide some explanation as to why they found them easy;

7. To identify whether Māori children were able to respond correctly to items presented after the ceiling point of standardised delivery on the PPVT-III.

2. Method

2.1 Participants

A total of 46 Māori children (24 boys and 22 girls) aged between 5 years 0 months and 10 years 9 months participated in this study. One child (male aged 7 years 1 month) took part in the study, but was later excluded from the sample due to not meeting the inclusion criteria. Participants comprised three different age groups, with the youngest group of children aged between 5–6 years 9 months (Mean = 5.98 years, $SD = 0.65$), the middle group aged between 7–8 years 9 months (Mean = 7.88 years, $SD = 0.49$), and the oldest group of children aged between 9–10 years 9 months (Mean = 10.11 years, $SD = 0.59$). Participants lived and attended schools in the Canterbury region. Of the 46 participants who took part in the study, 33 attended mainstream schools (72%), and 13 (28%) attended either Bilingual units within mainstream schools or Kura Kaupapa Māori.

2.1.1 Inclusion Criteria

In order to take part in the research, participants were required to meet a range of inclusion criteria. Participants who were approached to join the study completed a screening measure, which gauged the extent to which the inclusion criteria for participation was met (Appendix A). In accordance

with Ministry of Health guidelines (Ministry of Health, 2004), suitable participants were those who were identified by their parents/caregivers (using the 2001 census question) as Māori, were aged between 5 and 10 years 9 months, had no uncorrected vision or hearing problems, were described by their parents/caregivers as being competent in the English language, and were meeting key developmental milestones as reported by their parents/caregivers.

2.1.2 Recruitment of Research Participants

Participants were recruited over an eight month period, from 7/03/2006 to 7/11/2006. Given the specific characteristics required of the research sample, two main recruitment strategies were used to identify potential participants for this study. Participants were identified using community networks (through consultation hui and using existing Māori community networks), and snowball recruitment methods where additional participants were identified by current participants.

In order to address the generalisability of the data collected, a quota sampling approach was used, whereby participants were matched to the wider population of Māori children in New Zealand by the strata of gender, school type, and school decile rating (Clay, Ellis, Amodeo, Fassler, &

Griffin, 2003; Singleton, Straits, & Straits, 1993; Statistics New Zealand, 2002; Te Puni Kōkiri, 2000). While all strata provided an indication of the similarities between the research sample and the wider population from which the sample was drawn, the school decile rating strata also provided a measure of socio-economic deprivation. School decile ratings are calculated by considering on the socio-economic status of students that attend each school. School deciles are based on the consideration of five factors: household income; parental occupation; household crowding; parental educational qualifications; and parental income support (Ministry of Education, 2006). Decile ratings range from one to ten, with decile one schools having the highest proportion of students from the lowest socio-economic communities, and decile ten schools having the lowest proportion of these students (Ministry of Education, 2006). Due to the small number of participants in each of the ten deciles, children were sorted into low (decile 1-3), mid (decile 4-7), and high (decile 8-10) decile school groups.

Information was obtained from current New Zealand statistics detailing each of the strata, and was converted to a percentage in order to calculate the required number of participants for the research sample. Table 1 provides further information pertaining to the characteristics of those participants who took part in the research.

Table 1. Characteristics of Research Participants.

	5-6 years	7-8 years	9-10 years	Total (N=46)	Population Strata
Low decile (1-3)	6	7	7	20	16.9 ^a
Mid decile (4-7)	8	7	3	18	18.8
High decile (8-10)	2	2	4	8	10.1
Males	8	8	8	24	23.1 ^b
Females	8	8	6	22	23.0
Mainstream	12	9	12	33	32.2 ^c
Kura/Bilingual	4	7	2	13	13.8

^a = Quota acquired directly from Ministry of Education July 2006 SAS System figures describing Māori enrolments in the Canterbury Region by School Decile from School Years 1-6.

^b = Quota acquired from 2001 census data (Table 5) describing gender distribution of Māori children aged 5-19 years who reside in the Canterbury region (Statistics New Zealand, 2002).

^c = Quota acquired from Ministry of Education figures describing rates of participation in Māori language by primary school students and includes Māori children enrolled in either bilingual or immersion school settings (Te Puni Kōkiri, 2000).

Of those participants approached to take part in the research, one child who did not meet inclusion criteria was excluded from the study, four were unable to be contacted by the researcher, and one chose not to participate. Due to the wide range of community networks used to distribute information pertaining to the research, it is impossible to establish how many suitable participants chose to passively decline. Table 2 provides detailed information outlining the ways in which participants were recruited for the study.

Table 2: Recruitment Methods used to Locate Final Research Participants.

Recruitment Source	Number of Participants
Direct from Consultation Hui	4
Personal Networks	13
Community Networks	17
Snowball: Referral from Participants	12
TOTAL	46

2.2 Materials and Apparatus

2.2.1 *Peabody Picture Vocabulary Test – III*

Participants who took part in the study were assessed using the third edition of the Peabody Picture Vocabulary Test (PPVT-III), a psychometric test that was developed and standardised on a representative U.S. sample in 1997 (Dunn & Dunn, 1997). The PPVT-III is an individually administered test, comprised of two parallel forms (Form IIIA and Form IIIB) allowing for repeat administration of the test as required. For the purposes of this study, Form IIIA of the PPVT-III was used with all participants.

The test was designed to measure receptive vocabulary in the English language, and is commonly used to assess a person’s verbal ability, or as part of a wider battery of tests measuring cognitive functioning (Dunn & Dunn, 1997). A particular strength of the PPVT-III, which utilises pictures and spoken words rather than print, is the wide age-range (2½ to 90+ years) with which it can be applied (Dunn & Dunn, 1997). In order to complete the test, examinees are asked to choose which one of four pictures best represents a

given word that is read to them by the examiner. For example, on one of the training items from the PPVT-III, participants were asked to choose which of four pictures represented the word 'dog'.

When following standardised administration procedures, the PPVT-III is quick and easy to administer, taking an average of 11-12 minutes to complete (Dunn & Dunn, 1997). Forms IIIA and IIIB of the test each consist of 204 items in total, which are grouped into 17 sets of 12 test items. Testing begins by identifying a basal set, with test starting points suggested by the examinees age, and is established when one or no errors are made in that particular set. For most examinees, testing proceeds through an average of five sets, and is discontinued at the ceiling point after eight or more errors occur in a single set (Dunn & Dunn, 1997).

In terms of its psychometric properties, the PPVT-III is reported to be a reliable and valid measure that shows consistency between forms and administrations of the test, and a strong relationship with associated measures of language (Williams & Wang, 1997). Specific reliability measures for both Forms of the PPVT-III were provided, with the median coefficient alpha being .94 across all standardisation sample age groups (Williams & Wang, 1997). Test-retest reliabilities were also calculated, with

corrected coefficients on both Forms IIIA and IIIB ranging from .91 to .94 across all age groups tested (Williams & Wang, 1997). Convergent validity was demonstrated by assessing the extent to which PPVT-III scores were correlated with other measures of verbal ability, which ranged from .80 to .92 across various measures (Williams & Wang, 1997). Discriminant validity was assessed by comparing PPVT-III scores with measures of different traits, and as expected, revealed lower correlations ranging from .62 to .85 (Williams & Wang, 1997).

2.2.2 Test Environment

For all children who took part in the research, testing was conducted in a quiet place where they felt most at ease. Forty-one participants chose to undertake testing in their own homes, while five elected to be tested in a work environment. Most children preferred to carry out testing whilst sitting on the floor with the examiner, often with their parents or a caregiver nearby. Efforts were made to ensure that each child experienced similar test conditions, with emphasis placed on reducing test anxiety while providing a quiet test environment that was largely free from distractions.

2.2.3 Additional Test Materials

In addition to the PPVT-III a number of forms and recording devices were used throughout testing. A Dictaphone was used to record the children's qualitative comments with regards to the PPVT-III itself. A blank record sheet separated into 12 segments was used to assist with item error analysis, with incorrect item numbers recorded in the top left hand corner of each segment, and qualitative descriptions of target pictures noted below. All test materials were kept in an A4 size box, which for many children appealed as an incentive to complete testing in order to see what was inside.

2.3 Procedure

2.3.1 Ethics Approval

A request for ethical approval to undertake the research was submitted to the University of Canterbury Human Ethics Committee in June 2005. Ethics approval was granted in August 2005.

2.3.2 Initial Community Consultation: Prevalence of PPVT-III Use

It was the intention of this study to undertake consultation with professionals currently working with children in the Canterbury region with regards to their administration and use of the PPVT-III. Given that the PPVT-III is a test developed, standardised, and normed for use in the United States, it was

hoped to use administration procedures in this research project which mirrored those typically employed by local professionals. Key personnel employed by the Group Special Education service (GSE), namely the Pouwhakarewa Matauranga, Executive Officer, and Southern Regional Manager, were contacted by telephone and email and informed of the ensuing research. A consultation meeting was held with the Pouwhakarewa Matauranga and key Māori staff from GSE to discuss the research, and make arrangements for all general field staff to complete the scoping survey outlining their use of the PPVT-III (Appendix B). Despite efforts by the researcher and GSE Māori staff to administer this scoping survey, timing constraints and work conditions with increased caseloads during school terms, resulted in field staff being unable to complete the survey. The decision was then made to proceed with standardised test administration in accordance with the procedures set out in the PPVT-III examiners manual.

2.3.3 Community Consultation: Initial Research Hui with Māori Community

In line with a Kaupapa Māori methodological approach, meetings were arranged with Key Māori Community Contacts before the data collection phase in order to discuss the ensuing research. Meetings were held with the Māori/Indigenous Health Institute, mandated by Mana Whenua ki Waitaha to

give appropriate advice on Māori health research conducted within the Canterbury region; He Oranga Pounamu, mandated by Ngai Tahu Development Corporation; and Māori staff from the Ministry of Education, Special Education Southern Branch. The proposed research and methodology was presented to each group for comment and as part of the consultation process. Amendments to the research methodology were made in response to this consultation and finalised as a result of this process. Suggestions included adding a question regarding the iwi affiliation/s of participants, and ensuring that the research findings were reported back to participants and their whānau through an individualised test summary as well as a community report.

2.3.4 Pilot Testing

In preparation for participant recruitment, pilot testing was conducted with one child from each of the three age groups of children. Outcomes and observations from pilot testing were discussed with supervisors and research protocols were decided as a result.

2.3.5 Interview and Consent Process: Parents and Children

Potential participants identified by community networks and existing participants were provided with a copy of the General Information Form

which outlined the research project (Appendix C). The researcher then contacted each potential participant to discuss their willingness to take part in the project. Contact was made either by telephone or face to face, depending on participant's access to these means of communication, with a standard dialogue used to recruit parents/caregivers and their children (Appendix D).

Arrangements were made to meet directly with willing parents/caregivers and their children at a time and place that suited them best. All but five research participants opted to meet with the researcher in their own home, with remaining participants electing to meet at their place of work. Parents/caregivers were provided with another copy of the General Information Form to keep, and the process of participation was discussed in depth. At this time consent was sought, and an Informed Consent Form was signed by willing parents/caregivers (Appendix E). A screening measure was then administered by the researcher to ensure that participants were eligible to take part in the study (Appendix A).

Parents/caregivers were then asked to complete a short developmental survey, which took approximately five minutes to complete (Appendix F).

The researcher provided assistance to parents/caregivers as required, and once completed the questionnaire was returned to the researcher.

With the parent/caregiver present, the researcher met with the child, and explained the purpose and process of research participation. Children were provided with a Child Information Form (Appendix G), and after reading/listening to the form, were asked to sign a Child Assent Form (Appendix H) if they agreed to take part in the research.

2.3.6 PPVT-III Testing

Testing was carried out in a standardised manner in accordance with the procedures set out in the PPVT-III examiners manual. As outlined above, PPVT-III testing was conducted with all children in a quiet environment free from distractions. Testing was initiated following a standard introduction and test administration procedure (Appendix I). Children were tested according to standardised procedures by establishing a basal set, and continuing through sets until their ceiling point was reached at which point testing was suspended. Then children were given a short break where they were invited to look through the remaining picture items to see if there were any pictures that they were able to recognise. During the break, the examiner took note of all incorrect responses on a blank response sheet,

recording the item numbers, and correct picture numbers onto the sheet. The examiner then revisited incorrect items below the ceiling set, and asked participants to name the word that best described the picture presented to them. This information was recorded verbatim on the blank response sheet.

The final phase of testing involved asking participants some qualitative questions related to their perceptions of the PPVT-III which was recorded using a Dictaphone (Appendix 9). At the end of this process, children were thanked for their participation, and were provided with a koha of a \$10 gift voucher for The Warehouse and some stickers as a token of appreciation for their assistance with the research. Once testing was completed, observations about the testing process were recorded on the PPVT-III performance record by the researcher to enable individualised feedback to be given to each participant. Participant raw scores were converted to standard scores following the procedures set out in the PPVT-III test manual. Standard scores were based on the chronological age of participants at the time testing was conducted.

2.3.7 Administration of PPVT-III with Māori Children

Although a standardised approach to test administration was used as a guide throughout the study, reflection revealed that a Māori process had been used

by the researcher in order to engage Māori children in the research. Prior to testing, time was spent connecting with participants and their whānau through establishing whakapapa and community links, and discussing the process and purpose of the research. The researcher was known to be Māori by all research participants, which in some cases facilitated the use of te reo Māori in response to PPVT-III test items. For example, a number of children indicated the correct item by using Māori numbers such as “tahi”, “rua”, “toru” or “wha”, while others translated English words into Māori before generating a response such as “waka” for the word “canoe”. Efforts were made to ensure that all participants were recognised and validated as Māori throughout the assessment process. When assessing children from Māori-medium schools, accurate pronunciation and word repetition (where participants could repeat the target word to the examiner) was encouraged to ensure that participants understood each word prior to selecting a response. Many children employed this strategy spontaneously, where they would watch the examiners mouth while the word was being presented, repeat the word to themselves while scanning the PPVT-III picture plates, and look to the examiner for assurance of word understanding prior to responding to each item.

When comparing the picture plates and test materials provided by the PPVT-III with modern mediums of entertainment commonly used by children, such as computer games and interactive books, it was apparent that the black and white picture plates were not as visually appealing. Therefore, in order to engage the children, test administration was conducted in an upbeat manner with an extensive use of praise and encouragement throughout, regardless of test performance. As well as increasing motivation to complete the test, this approach worked to reduce test anxiety, increase efficacy in relation to test performance, and ensure continued responses to difficult items. As all participants were assessed in a relaxed environment that was familiar to them, this may have further enhanced their performance on the test.

2.3.8 Final Consultation: Feedback to Key Māori Stakeholders

Once the data had been collected from all sources and preliminary analyses completed, a final consultation hui was conducted. A presentation was organised inviting all Key Māori Community Stakeholders involved in prior consultation to attend. This included personnel from Group Special Education, MIHI, and He Oranga Pounamu. Research findings and interpretations of the data were discussed with Key Stakeholders in line with the adopted Kaupapa Māori research methodology framework. Feedback was sought regarding Key Māori Stakeholders interpretations of the results,

and suggestions for ways in which to disseminate the research findings. Suggestions arising from the consultation hui included: the need to emphasise the importance of the assessment approach used in the research when interpreting the results; appropriate journals, conferences, and hui at which to present the research findings; and the importance of providing clear feedback to whānau through the production of a community report and individualised feedback letter. In cases where children had experienced considerable difficulty completing the PPVT-III, it was also decided to telephone whānau once they had received individualised feedback about their child's performance. It was envisaged that this would provide opportunities for whānau to voice any concerns that they may have, and seek advice if required.

2.3.9 Dissemination of Research Findings

Research findings were disseminated in a number of ways besides the production and submission of a Masters thesis. A community report was also produced, providing a summary of key research findings (Appendix J). This report was disseminated to whānau who had taken part in the research and other Key Māori Stakeholders. As well as the community report, individualised feedback was provided to participants and their whānau through direct telephone calls and in a letter outlining each child's

performance on the PPVT-III. It is also envisaged that the findings from this study will result in the production of at least one journal article, along with presentations at relevant community, education and psychology conferences/hui.

2.4 Analysis

2.4.1 *Quantitative Data*

Quantitative data was managed using Microsoft Excel spreadsheets, and was analysed through both Excel and SPSS statistical software packages.

Planned ANOVA comparisons were conducted in order to compare the standard scores of participants from each of the three age groups, and the standard scores of participants attending different decile schools. T-tests were conducted in order to compare standard scores obtained on the PPVT-III by participants, with the mean score of 100. T-tests were also used to investigate standard score differences between male and female participants, participants attending different school types, and children with or without hearing problems. When comparing the standard scores obtained by children from different school types, participants were sorted into two groups.

Children attending mainstream classes in mainstream schools were defined as the 'Mainstream' group, and children attending either Kura Kaupapa or Bilingual units within mainstream schools were defined as the 'Māori-

medium' group. Univariate ANOVA comparisons were conducted to investigate standard score differences between males and females in each age group, and between males and females in different schools. Post-hoc comparisons were made in cases where significant differences were noted.

In addition to standard score comparisons, analyses were conducted to compare the percentage, rate, and number of errors made on individual PPVT-III items. In cases where an error had been made, information was gathered regarding participants' responses to the correct stimulus picture, coded, and finally entered into a Microsoft Excel spreadsheet. This spreadsheet profiled the pattern of errors, and responses to the correct stimulus made by each participant on PPVT-III test items.

2.4.2 Qualitative Data

Qualitative data was recorded for each participant using a Dictaphone, and was later transcribed and retained in a Microsoft Word document. A preliminary interview schedule was developed through consultation with research supervisors (Appendix I). Questions were aimed at developing an understanding of Māori children's impressions of the PPVT-III, including their perceptions of both positive and negative aspects of the test.

Five questions were developed and trialled in a pilot testing phase, which included three participants, one child from each age group. The first two questions sought to establish what aspects of the test were most liked or disliked by participants. The second two questions aimed to identify any pictures from the PPVT-III that were unfamiliar to Māori children, while the final question allowed participants the opportunity to make additional comments regarding their impressions of the PPVT-III.

Results and initial impressions from the pilot testing phase were discussed with research supervisors. It appeared that some questions were not functioning as effectively as others, due in part to the age of participants and the power relationship that existed between participants and the examiner. Many participants demonstrated a tendency to please the examiner by responding favourably to all aspects of the PPVT-III, while limiting their inclination to offer critique.

At this point, two additional questions were added to ensure that participants were given every opportunity to discuss any aspects of the test that could be improved. One question asked participants to describe how other Māori children might perceive the test, with the hope of increasing opportunities to offer critique by allowing participants to externalise their own negative

perceptions of the PPVT-III. The second question replaced one of the preliminary piloted questions and was used to establish how easy or difficult the test was in situations where participants had encountered unfamiliar PPVT-III pictures. Qualitative data was transcribed immediately following each assessment. Initial interpretations and identification of difficulties arising from participant interviews assisted with further refinement of the interview schedule.

In addition to interview transcripts, qualitative data was also gathered in relation to errors made on individual PPVT-III test items. After test administration was completed, incorrect items were re-administered to participants, who were asked to name the word that best described the picture presented to them. Participant responses were recorded verbatim on to a blank response sheet, and were later entered into a Microsoft Excel spreadsheet. Once all responses had been entered, they were coded in order to facilitate an understanding of the reasons for participant errors. Seven codes were derived from the qualitative error data to allow for comparisons to be made between participant groups. In addition to coded responses, verbatim descriptions were retained in a Microsoft Word document to help identify alternative words or pictures that could be used in place of PPVT-III items found to contain culturally biased content.

Analysis of the qualitative interview data involved reading the transcripts and coding general themes. Given the brevity of dialogue for some participants and the process of refinement undertaken during the development of interview questions, re-coding was not required, with three main themes arising as a result. Qualitative data was cleaned by removing identifying statements from the coded transcripts prior to including these in the final results.

2.4.3 Data Integrity

Throughout the data analysis phase, regular checks were made in order to ensure the integrity and accuracy of the data. In the event that inconsistencies were found within or between data sets, the original data source was accessed, and data was re-entered for all participants into a 'clean' database. When applying statistical formula, calculations were checked at three points in the dataset. If any inconsistencies were noted, all participant records were rechecked and corrected as necessary.

3. Results

In the section that follows, results of the quantitative analysis will be presented first, followed by the results of the qualitative analysis. The quantitative results section will begin by outlining the demographic characteristics of the research sample prior to presenting the outcomes from PPVT-III test administration and error analysis. Finally, results from the qualitative analysis will be reported with regards to participants' perceptions of the PPVT-III.

3.1 Demographic Information

Analysis of the developmental survey and screening measures revealed the diverse backgrounds and experiences of participants and their whānau who completed the research. This information will be presented in order to provide a detailed overview of the characteristics of participants who took part in the study. Responses were obtained from 44 out of 46 participants, with two choosing not to return completed surveys. All surveys and screening measures were completed by either the child's mother or father, although not all children were living with their parents at the time of the study.

3.1.1 Developmental History

Pregnancy Problems: Six parents who completed developmental surveys reported the occurrence of prenatal problems prior to the birth of their child. Problems experienced included symphysis pubis dysfunction leading to pain in the pelvic region; high blood pressure; hormonal allergies; kidney stones; and an incompetent cervix resulting in premature delivery.

Maternal Age at Birth: Whānau were asked to report the age of participants' mothers at the time when their child was born. The average maternal age for participants' mothers was 26.7 years, and ranged from 17 to 38 years of age. These figures are comparable to recent statistics, which showed that in 1994 the average age for Māori women to give birth was 25.1 years (Mantell, Craig, Stewart, Ekeroma, & Mitchell, 2004).

Birth Problems: Twelve participants described experiencing problems during the delivery of their child. Problems encountered during birth included a long labour; breach, forceps, and vacuum assisted occiput posterior delivery; emergency caesarean section delivery; and post-term delivery. Five children who took part in the study were described by their parents as premature babies, being delivered between two and ten weeks early. According to recent statistics, 6.1% of babies born to Māori mothers

in 1994 were born prior to 37 weeks gestation, while for the current sample 6.5% of participants met this criteria (Mantell et al., 2004). Two parents also reported that their child had experienced additional problems after birth, with one stating that their child had an epileptic seizure, and one reporting that their child was born with the umbilical cord around their neck.

Birth Weight: Children who took part in the study ranged in weight at birth from 2lb 12oz, to 10lb 8oz. The average birth weight of participants was 7lb 5oz, which was also the average birth weight for Māori babies according to the most recent national data (Ministry of Health, 2006a).

Birth Order: More than 70% of participants who took part in the study were either first or second born in relation to their siblings, with the remaining participants being third, fourth, sixth or seventh in terms of birth order.

While information was not collected regarding family size, these findings tend to reflect national data which shows that the average family size in New Zealand is now comprised of 1.9 children (Statistics New Zealand, 1998).

While it is unclear from the data collected how many children were in each whānau, it is likely that many participants came from families comprising one or two children.

Infancy: Whānau were asked to report the extent to which their child had experienced difficulties as an infant. Six parents reported that their child had experienced feeding problems, three reported sleeping problems, and ten reported other problems. Difficulties encountered included allergies, eczema, asthma, bronchitis, glue ear, speech problems, and the death of a parent.

Developmental Milestones: Parents were asked to recall the age at which their child achieved a number of key developmental milestones. These questions proved difficult for many parents to accurately recall, with some referring to Plunket/Well Child book records, and others attempting to guess the approximate age at which these milestones were achieved. Table 3 depicts the mean and range of ages (minimum and maximum) at which participants were reported to have taken their first steps, spoken their first word, and completed toilet training.

Table 3: Age at Which Participants Achieved Developmental Milestones.

	Age took first steps	Age spoke first word	Age toilet trained during day	Age toilet trained during night
Mean	11.6 mth	11.2 mth	2 yr	2 yr 8mth
Minimum	8 mth	5 mth	9 mth	7 mth
Maximum	20 mth	2 yr	3 yr 9mth	7 yr

Adverse Developmental Experiences: In addition to developmental milestones, parents were asked to describe whether their child had experienced any adverse life events, such as illness or injury. In relation to childhood illnesses, eight participants had experienced measles, four had mumps, 24 had encountered chicken pox, four had whooping cough, 27 had experienced ear infections, 13 had associated hearing problems, and one child was reported to have had problems with vision which had required a corrective operation as an infant. Parents also reported the occurrence of more serious difficulties, with seven children having experienced a serious illness, 26 who were hospitalised, and nine children who had been in an accident. Serious illnesses experienced by child participants included kawasaki disease, bronchitis, bronchiolitis, meningococcal disease, croup, shingles, left side hemiplegia, and severe forms of common childhood illnesses, such as asthma and measles. Accidents encountered by participants were relatively minor, and tended to involve soft tissue or bone injuries.

Early Childhood Education: All but one participant had attended some form of early childhood education prior to school entry, indicating that 98% of the research sample had been enrolled in an early childhood service. According to national figures, in 1996, 42.8% of Māori children aged less

than five years were enrolled in preschool education, indicating a higher rate of early childhood attendance among research participants than would be expected (Ministry of Education, 2003b). Table 4 provides details of the types of early childhood services participants attended. Some children attended more than one type of early childhood service during their preschool years.

Table 4: Type of Early Childhood Education Service Attended by Participants.

	Attended Service	Percentage (n=42)
Kindergarten	23	55%
Kōhanga Reo	13	31%
Bilingual Preschool	4	9%
Private Childcare Service	2	4%
Other*	19	46%

*Other includes Early Childhood Centre, Daycare Centre, Preschool, and Playcentre.

3.1.2 Iwi Representation

Of participants who took part in the research, 36 (78%) provided information regarding their iwi affiliations. A total of 25 iwi groups were represented by the children who took part in the research, with some children identifying with as many as four iwi. Table 5 shows the number of children who affiliated with each of these iwi groups. While it was not possible to compare the representativeness of participant's iwi affiliations with Māori residing in Canterbury, census information revealed similarities between

participants and other Māori children, 81% of whom were able to identify their iwi affiliations (Statistics New Zealand, 2001) .

Table 5: Iwi Affiliations Identified by Participants.

	Number	Percentage (n=36)
Ngāi Tahu	17	47%
Te Āti Haunui a Pāpārangī	8	22%
Ngāti Kahungungu	7	19%
Ngā Puhī	6	17%
Ngāti Porou	6	17%
Ngāti Tūwharetoa	5	14%
Te Arawa	5	14%
Tainui	5	14%
Kāti Mamoe	4	11%
Te Rarawa	2	6%
Ngāti Hikairo	2	6%
Ngāti Maniapoto	2	6%
Ngāti Hako	2	6%
Ngāti Pāoa	2	6%
Ngāti Whakaue	2	6%
Waikato	2	6%
Te Aupouri	2	6%
Ngāi Tūhoe	1	3%
Ngāti Apa	1	3%
Ngāti Mutunga	1	3%
Waitaha	1	3%
Te Whānau a Apanui	1	3%
Ngāti Kauwhata	1	3%
Rapuwai	1	3%
Rangitāne	1	3%

3.1.3 Ethnicity

As described previously, in adherence to Ministry of Health (2004) protocols for the collection of children’s ethnicity data, all participants who took part in the research were identified by their parents as Māori using the ethnicity question from the 2001 census. Twenty-four participants identified with

more than one ethnic group, with some children identifying up to three or four ethnic groups. Table 6 shows the number of children who identified with the ethnic groups as set out by the 2001 census question.

Table 6: Ethnic Identity of Participants

	Number	Percentage (N=46)
Sole Māori	22	48%
Māori /NZ European	11	24%
Māori /Samoan	5	11%
Māori / NZ European/Chinese	3	7%
Māori /Cook Island Māori	2	4%
Māori /Fijian	1	2%
Māori /Australian European	1	2%
Māori /NZ European/Samoan/ Cook Island Māori	1	2%

3.1.4 Age Group Sample Characteristics

The demographic details of participants from each of the three different developmental age groups were compared in Table 1, and revealed minor differences between each group. While children in the 5-6 and 7-8 year old age group were similar across the strata sampled, children in the 9-10 year old age group were less likely to attend a Kura Kaupapa or Bilingual school than participants from other groups, and included more participants from high decile schools.

3.1.5 Mainstream and Māori -Medium School Sample Characteristics

Twenty-eight percent of the research sample were attending Kura Kaupapa or Bilingual schools at the time of the study (here on in referred to as Māori-medium schools). To allow for comparisons between these groups of children, analyses were conducted in order to ensure that mainstream and Māori-medium school participants represented similar groups of children in terms of sample characteristics. Table 7 demonstrates the differences and similarities between participants who were attending mainstream and Māori-medium schools. While participants were similar in terms of age measures, the distribution of participants by gender and school deciles differed between children of each school type. Given the variation between participants attending mainstream and Māori-medium schools, it would be difficult to rule out the influence of confounding factors should any differences be observed. In addition, no information was gathered regarding the language backgrounds and abilities of participants attending either school type. As research highlights, children attending Māori-medium schools tend to represent a more diverse group than mainstream school children in terms of their level of experience in both te ao Māori me te ao Pākehā (Bishop et al., 2001; McNaughton et al., 2006; Rau, 2001). Therefore, any differences observed between children from mainstream and Māori-medium schools should be interpreted with caution.

Table 7. Characteristics of Participants Attending Mainstream and Māori-Medium Schools.

		Mainstream (n=33)	Māori-Medium (n=13)
Male		20 (61%)	4 (31%)
Female		13 (39%)	9 (69%)
Age Descriptives	Mean	8.0	7.6
	Median	7.9	7.8
	Range	5.7	5.2
	Minimum	5.0	5.0
	Maximum	10.7	10.3
School Deciles	Low (1-3)	15 (45%)	5 (38%)
	Mid (4-7)	10 (30%)	8 (62%)
	High (8-10)	8 (24%)	-
Māori -Medium Preschool		8 (24%)	8 (62%)

3.2 Standard Score Comparison

3.2.1 Descriptive Data

Prior to conducting comparative analyses, descriptive and graphical information was reviewed in order to ensure the data met the required conditions of normality. Table 8 provides descriptive statistics pertaining to participants' performance on the PPVT-III, and outlines the mean, standard deviation, and minimum and maximum values obtained for standard scores, percentile rank, stanine, and age equivalents. Figure 1 provides a graphical depiction of standard scores obtained by participants on the PPVT-III.

Table 8: Descriptive Statistics Outlining Participants' Performance on PPVT-III.

	Minimum	Maximum	Mean	SD
Standard Score	73	127	96.7	12.5
Percentile Rank	4	96	42.4	26.6
Stanine	2	9	4.6	1.7
Age Equivalent	4	14	7.7	2.3

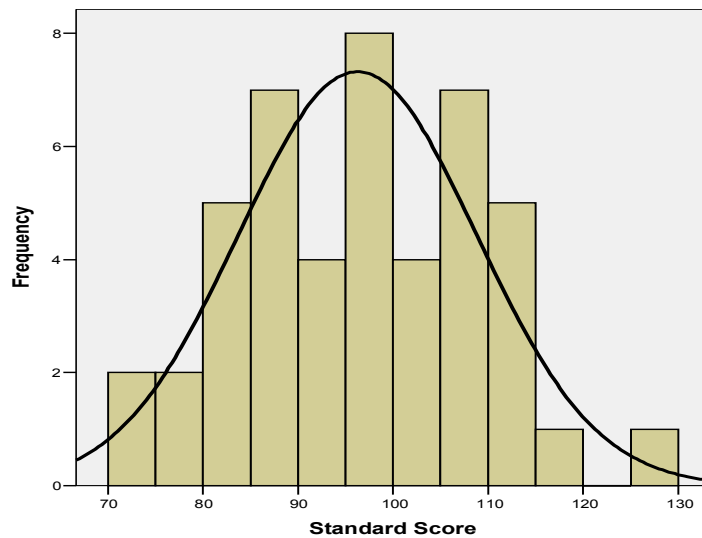


Figure 1: Distribution of standard scores obtained by all participants (N=46)

3.3 Comparative Analysis

3.3.1 Overall Results

A T-test was conducted in order to compare the standard scores obtained by Māori children who took part in the study with the standardisation sample mean of 100. Analysis revealed a significant difference between the mean standard score of 96.3 ($SD = 12.5$) obtained by Māori children and that of the standardisation sample, with Māori children found to score lower on the PPVT-III than the standardisation mean, $t(45) = -2.0, p < .05$ (two-tailed).

Additional analyses revealed that much of the observed differences could be explained by the variable of school type. Separate T-tests were conducted in

order to compare the standard scores obtained by children from mainstream and Māori-medium schools with the standardisation sample mean of 100. Results showed no significant difference between the mean standard score of participants attending mainstream schools ($M = 100.8$, $SD = 11.1$) and the standardisation mean, $t(32) = 0.7$, $p = .76$ (two-tailed). However, when comparing the standardisation mean with that obtained by Māori-medium participants ($M = 84.8$, $SD = 7.9$), a statistically significant difference was observed, $t(12) = -15.1$, $p < .0001$ (two-tailed).

3.3.2 Comparison by Age Group

An ANOVA revealed that contrary to our predictions, there were no significant differences found between the standard scores obtained by children in each of the three age groups sampled, $F(2,43) = 1.9$, $p = .16$. The mean standard scores obtained by children in each age group were, 99.6 ($SD = 11.2$) for the 5-6 year group, 91.5 ($SD = 12.8$) for the 7-8 year group, and 97.9 ($SD = 12.9$) for the 9-10 year group.

Although there were no significant differences between the age groups, the scores obtained by children showed a trend with the 5-6 year group obtaining higher scores than the 9-10 year group, while the lowest mean scores were obtained by the 7-8 year group. Post hoc comparisons were made by

comparing the scores of each of the three age groups of children in order to calculate effect sizes. Comparisons between the 5-6 and 9-10 year group revealed a small effect, $d = 0.1$. Comparisons between the 5-6 and 7-8 year group revealed a large effect of $d = 0.7$, while comparisons between the 7-8 and 9-10 year group showed a medium effect of $d = 0.5$. In light of these findings, further analyses were conducted in order to establish whether the initial non-significant findings may have been influenced by confounding factors such as school type. A factorial ANOVA comparing the scores obtained by children in each of the three age groups from mainstream and Māori-medium schools revealed a significant main effect for school type, $F(1, 40) = 15.9, p < .0001$; however, there was no main effect for age group, $F(2, 40) = 1.1, p = .33$, nor was there an interaction effect, $F(2, 40) = .014, p = .87$. These findings indicate that the trend towards different scores obtained by children from different age groups may have been influenced by the variable of school type; however, there were no significant differences between the scores obtained by children from each of the three age groups. Mean scores for this analysis are depicted in Table 9 and presented graphically in Figure 2.

Table 9: Factorial ANOVA Comparing Average Standard Scores Obtained on PPVT-III by 5-6, 7-8, 9-10 Year Participants Attending Mainstream or Māori-Medium Schools

School Type	Age Group	Mean	SD	n
Mainstream	5-6 Year	102.8	10.4	12
	7-8 Year	98.9	10.9	9
	9-10 Year	100.1	12.6	12
	TOTAL	100.8	11.1	33
Māori-Medium	5-6 Year	90.0	8.1	4
	7-8 Year	81.9	7.8	7
	9-10 Year	84.5	2.1	2
	TOTAL	84.8	7.9	13

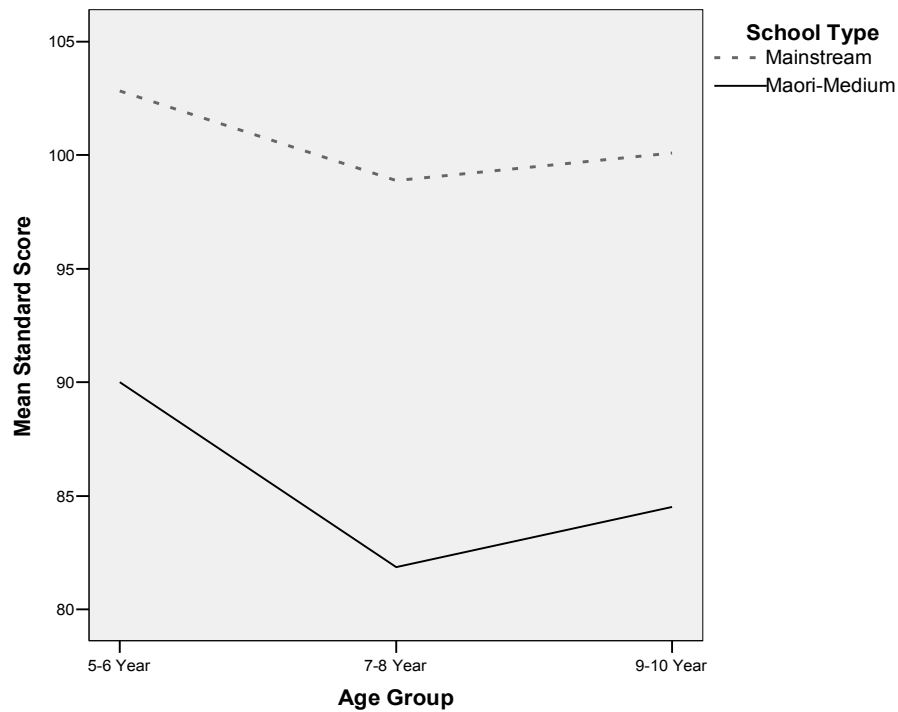


Figure 2: 2X2 ANOVA comparing standard scores by age group and school type, reveals a significant main effect for school type, and no significant age group difference or interaction effect

3.3.3 Comparison by Gender

Analyses comparing male and female participants revealed a significant difference in standard scores, with males obtaining an average score of 99.8

($SD = 12.4$), and females obtaining an average score of 92.4 ($SD = 11.7$), $t(44) = 2.1, p < .05$ (two-tailed). Further analyses were conducted to investigate possible reasons for the observed gender differences between PPVT-III standard scores. A factorial ANOVA comparing the scores obtained by males and females from mainstream and Māori-medium schools revealed a significant main effect for school type, $F(1, 42) = 17.1, p < .0001$; however, there was no main effect for gender, $F(1, 42) = 0.9, p = .35$, nor was there an interaction effect, $F(1, 42) = .079, p = .78$. These findings indicate that the differences between scores obtained by male and female participants were no longer significant when considering the influence of school type. Mean scores for this analysis are depicted in Table 10 and presented graphically in Figure 3.

Table 10: Factorial ANOVA Comparing Average Standard Scores Obtained on PPVT-III by Male and Female Participants Attending Mainstream or Māori-Medium Schools

School Type	Gender	Mean	SD	n
Mainstream	Male	102.5	11.4	20
	Female	98.1	10.6	13
	TOTAL	100.8	11.1	33
Māori-Medium	Male	86.5	9.0	4
	Female	84.1	7.8	9
	TOTAL	84.8	7.9	13

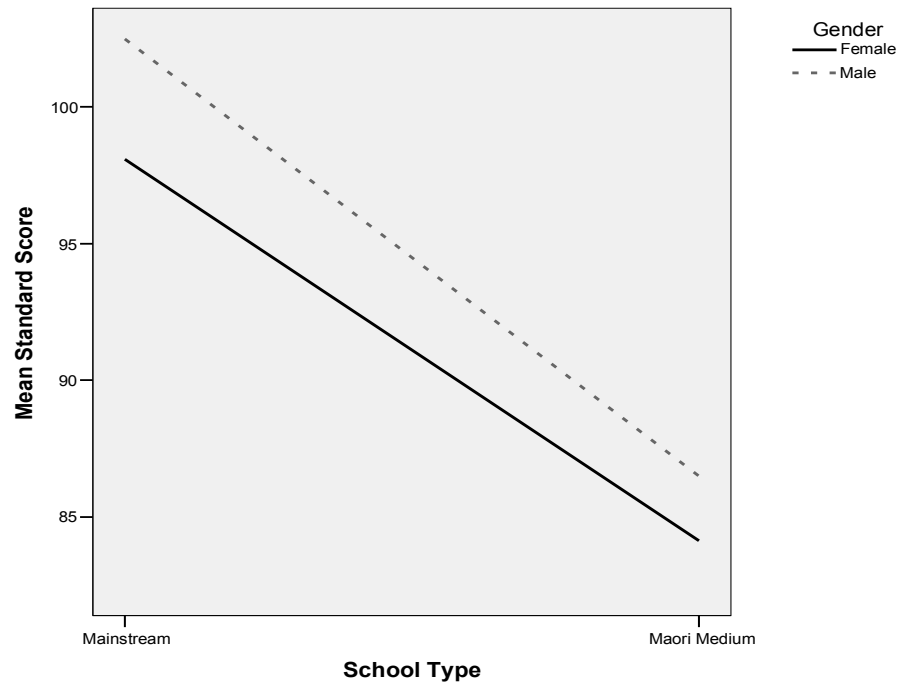


Figure 3: 2X2 ANOVA comparing standard scores by gender and school type. Reveals a significant main effect for school type, and no significant gender difference or interaction effect

3.3.4 Comparison by School Decile

Additional analyses were conducted in order to investigate the possible impact of demographic and developmental factors on standard scores. An ANOVA comparing the average standard scores of participants from low (1-3), mid (4-7), and high (8-10) decile schools revealed no significant differences between the standard scores of each group, $F(2, 43) = 2.0, p = .14$. Table 11 provides details of the average standard scores achieved by participants from each school decile. Comparisons of standard scores by

school decile and school type could not be made, as none of the children attending Māori-medium schools were in the high decile range.

Table 11: ANOVA Comparing Average Standard Scores Obtained on PPVT-III by Participants Attending Low, Mid, and High Decile Schools

School Decile	<i>M</i>	<i>SD</i>	<i>n</i>
Low (1-3)	98.1	14.7	20
Mid (4-7)	91.9	9.9	18
High (8-10)	101.4	9.9	8

3.3.5 Comparison of Participants With/Without Hearing Impairment

Although children were screened prior to taking part in the study, thirteen participants reported having some degree of hearing difficulty. A T-test was conducted in order to compare the average standard scores on the PPVT-III of those children with and without a history of hearing difficulties. The mean standard score for participants with hearing problems was 95.4 ($SD = 12.5$), while the mean score for those without was 97.2 ($SD = 13.3$). This difference was not statistically significant, $t(39) = .41$, $p = .68$ (two-tailed), suggesting that children with a history of hearing problems performed equally well on the PPVT-III as children without hearing problems.

3.3.6 Comparison by School Type

Further analyses were conducted in order to compare the standard scores obtained by participants from mainstream and Māori-medium schools.

Children attending mainstream schools obtained an average score of 100.8 ($SD = 11.1$) on the PPVT-III, while those attending Māori-medium schools obtained an average score of 84.8 ($SD = 7.9$), more than one standard deviation below the standardised mean of 100. This finding represents a statistically significant difference between scores obtained on the PPVT-III by mainstream and Māori-medium school children, $t(44) = 4.7, p < .0001$ (two-tailed). As described previously, due to the different characteristics observed between mainstream and Māori-medium school participants, it is difficult to rule out the influence of confounding factors on these results. Therefore, these differences should be interpreted with caution.

3.4 Error Analysis

Error analysis was conducted in order to investigate the suitability of individual PPVT-III test items when used with Māori children. Quantitative information was gathered in relation to the percentage, rate, and number of errors made on the PPVT-III by all participants. Qualitative information was also obtained by re-administering incorrect items to participants, and by asking them to describe the picture that depicted the correct response to the stimulus word. This information was recorded on a blank record sheet, and later coded in order to provide an understanding of the factors that contributed to participant errors.

3.4.1 Overall Error Percentage and Rate

Total error percentages were calculated for each participant by subtracting the ceiling item from the basal item, and dividing this figure by the number of errors made on the test to produce a total error percentage. The average total error percentage for participants on the PPVT-III was 35%, and ranged from 22% to 48% errors. The median basal item presented to participants was number 49 (minimum = item 13, maximum = item 85), while the median ceiling item was item number 108 (minimum = item 72, maximum = item 192).

Error rates were calculated by considering the number of errors made by participants on a particular PPVT-III item based on the number of participants who actually completed that item. Figure 4 shows the rate of errors made by all participants on PPVT-III test items, while Table 12 outlines which items resulted in the highest number of errors. As Figure 4 shows, higher error rates occurred at points where fewer children were presented with a particular item, with peaks or dips in the middle of the graph being more meaningful than peaks at either end.

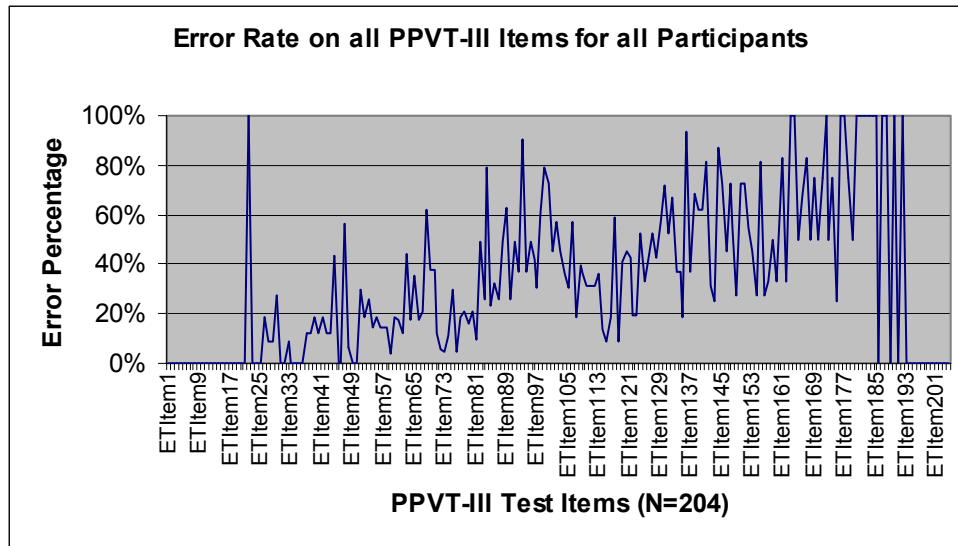


Figure 4: Error rate on all PPVT-III test items by participants presented with each item

Table 12: Most Common Errors Made by all Participants on the PPVT-III

Item #	Word	# of Errors	Error Rate
93	Pitcher	39	91%
84	Wrench	34	79%
99	Bouquet	26	79%
100	Rodent	24	73%
89	Canoe	27	63%

3.4.2 Error Percentage and Rate by Age Group

Comparisons of errors were made between each of the three age groups of children included in the study. The total error percentage was similar for children from each age group, with the 5-6 year group producing on average 35% errors, the 7-8 year group 36% errors, and the 9-10 year group 35% errors. Table 13 provides details of the most common errors made by children in each age group, with items resulting in an error percentage of 40% or more being included. Figures 5a, 5b, and 5c present the data for each

age group graphically. Descriptive statistics regarding ceiling and basal items are presented for each age group in Table 14.

Table 13: Most Common Errors Made by Participants in Each Age Group on the PPVT-III

		5-6 year group (n=16)	7-8 year group (n=16)	9-10 year group (n=14)
Item #	Word	% of Errors	% of Errors	% of Errors
63	Luggage	44%	62%	-
68	Signal	69%	69%	-
69	Squash	-	62%	-
70	Globe	56%	-	-
82	Camcorder	53%	-	67%
84*	Wrench	93%	88%	50%
88	Surprised	-	75%	-
89*	Canoe	77%	63%	50%
91	Clarinet	62%	50%	-
92	Exhausted	77%	-	-
93*	Pitcher	100%	88%	86%
95	Polluting	92%	50%	-
96	Vine	62%	50%	-
98	Dissecting	-	67%	57%
99	Bouquet	-	92%	64%
100	Rodent	-	83%	57%
102	Valley	-	67%	43%
106	Adjustable	-	75%	-
113	Timer	-	-	54%
130	Appliance	-	100%	58%
132	Hatchet	-	-	67%
136	Upholstery	-	-	91%
140	Pastry	-	-	73%
141	Cornea	-	-	82%
144	Colt	-	-	82%

* Items that resulted in a high number of errors across all three age groups tested

Table 14: Descriptive Statistics Outlining PPVT-III Basal and Ceiling Points by Age Group

		Median	Minimum	Maximum
5-6 year group	Basal	25	13	49
	Ceiling	96	72	156
7-8 year group	Basal	49	25	73
	Ceiling	108	96	180
9-10 year group	Basal	73	49	85
	Ceiling	156	108	192

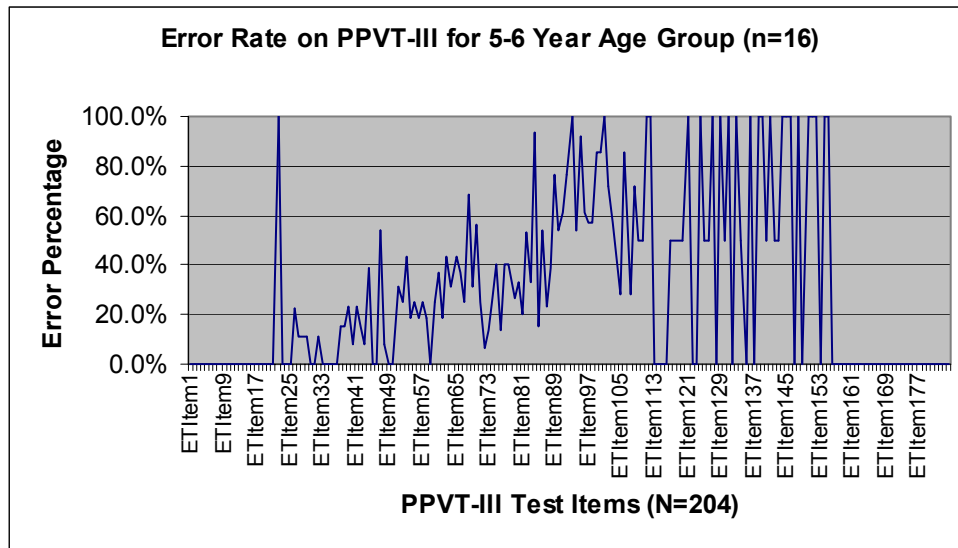


Figure 5a: Error rate on PPVT-III test items made by participants in the 5-6 year age group

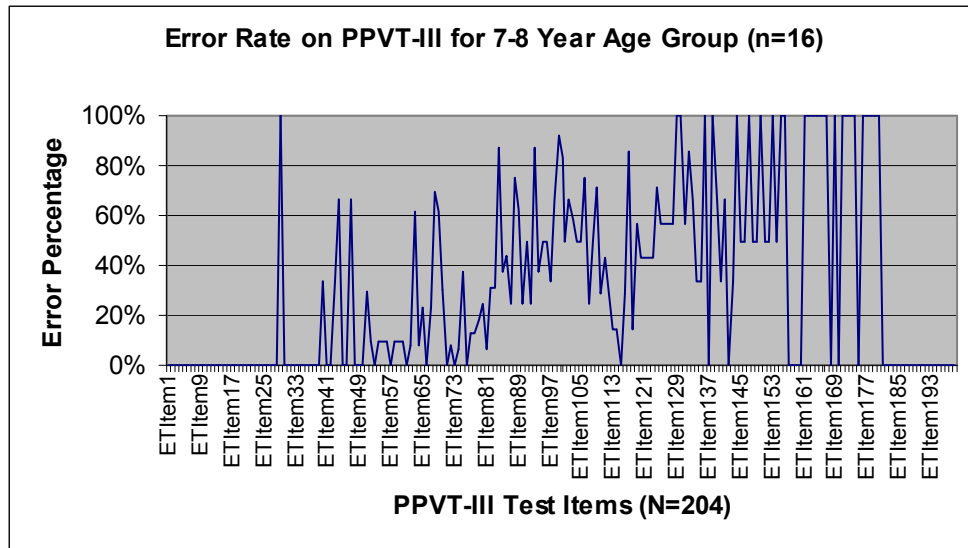


Figure 5b: Error rate on PPVT-III test items made by participants in the 7-8 year age group

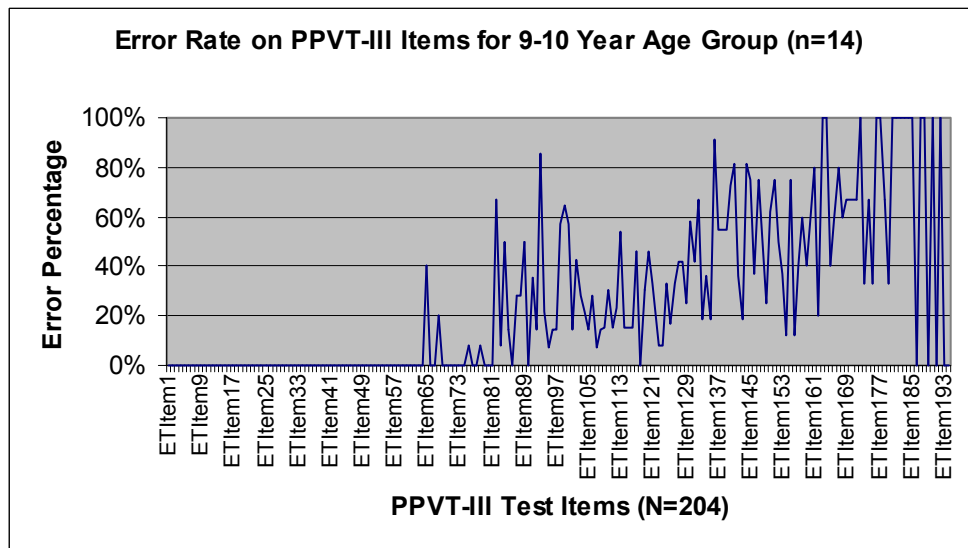


Figure 5c: Error rate on PPVT-III test items made by participants in the 9-10 year age group

On review of the graphs it appeared that some items were either easier or more difficult to complete than others. However, on closer examination, it was discovered that most items resulting in very high or low error rates in

the middle of the test had been completed by fewer participants. Items resulting in the least errors tended to be placed earlier on in the test or at points in the test where fewer children had been exposed to that particular item.

As Figure 5a shows, a number of items completed by participants from the 5-6 year age group resulted in few or no errors prior to reaching the ceiling point. These items (item number 113-116) were presented to only two children, both of whom provided correct responses resulting in an error rate of zero. In Figure 5b, which outlines results for participants from the 7-8 year age group, item 115 (target word = links) resulted in no errors despite being presented to seven participants, while items 137 (target word = hoisting) and 142 (target word = constrained) were presented and completed correctly by three participants. In Figure 5c, item 118 (target word = archery) produced an error rate of zero after being successfully completed by all 13 participants aged 9-10 years who attempted that item.

While three items resulted in high rates of error across all age groups, there was a clear difference between developmental groups in terms of which items resulted in the most errors. Due to the test administration approach required by the PPVT-III, where basal and ceiling points are established and

children are not exposed to all test items, it was not surprising to notice a differential pattern of responding for children across the age groups assessed.

3.4.3 Error Percentage and Rate by Gender

The total error percentage was similar for male and female participants, with males producing on average 34% errors, and females with an average of 35% errors. Figure 6 shows the error rate obtained by male and female participants on all PPVT-III items, while Table 15 provides descriptive details of the basal and ceiling items presented to these participants.

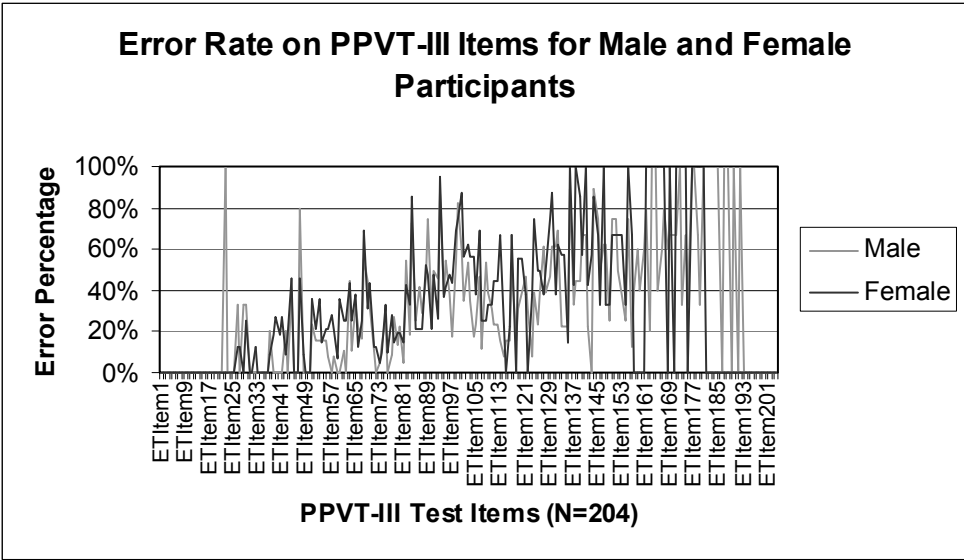


Figure 6: Error rate on PPVT-III test items made by male (n=24) and female (n=22) participants

As Figure 6 shows, a number of items completed by male and female participants resulted in few or no errors prior to reaching the ceiling point. For male participants, two items resulted in an error rate of only 7.7% despite being presented to 23 out of 24 participants. These items were number 114 (target word = injecting) and item 123 (target word = hazardous). Item 143 (target word = pedestrian) was presented to nine male participants, all of whom provided correct responses. For female participants, three items produced an error rate of zero which required further analysis. It was discovered that items 115 (target word = links) and 118 (target word = archery) were presented and accurately completed by nine out of 22 female participants. Item 122 (target word = dilapidated) was completed successfully by eight female participants, while Item 136 (target word = upholstery) resulted in a 100% error rate despite being presented to seven participants.

Table 15: Descriptive Statistics Outlining PPVT-III Basal and Ceiling Points by Gender

		Median	Minimum	Maximum
Male	Basal	49	13	85
	Ceiling	132	96	192
Female	Basal	43	25	73
	Ceiling	108	72	180

3.4.4 Error Percentage and Rate by School Type

Given the differences observed between mainstream and Māori-medium school children on standard score comparisons, additional analyses were conducted in order to compare errors on the PPVT-III. Table 16 shows the items that resulted in the most errors for mainstream and Māori-medium school children, while Figure 7 provides a graphical representation of the error rate for participants from different school types. Children attending Māori-medium schools had a similar error percentage to mainstream school participants, with rates of 37% and 35% respectively. Descriptive statistics regarding ceiling and basal items are presented for participants from each school type in Table 17. Although there were several items that had resulted in low and high error rates for participants from both school types, further analysis revealed that all of these items had been completed by less than three participants.

Table 16: Most Common Errors Made by Mainstream and Māori-Medium School Children on the PPVT-III

		Mainstream Group (n=33)	Māori-Medium Group (n=13)
Item #	Word	% of Errors	% of Errors
63	Luggage	-	82%
68	Signal	57%	73%
69	Squash	-	55%
70	Globe	-	64%
75	Vase	-	50%
82	Camcorder	52%	-
84	Wrench	74%	92%
86	Tambourine	-	55%
87	Palm	-	64%
88	Surprised	44%	64%
89	Canoe	63%	64%
91	Clarinet	47%	55%
93	Pitcher	88%	100%
94	Reptile	-	64%
95	Polluting	47%	55%
96	Vine	-	64%
99	Bouquet	78%	83%
100	Rodent	67%	100%

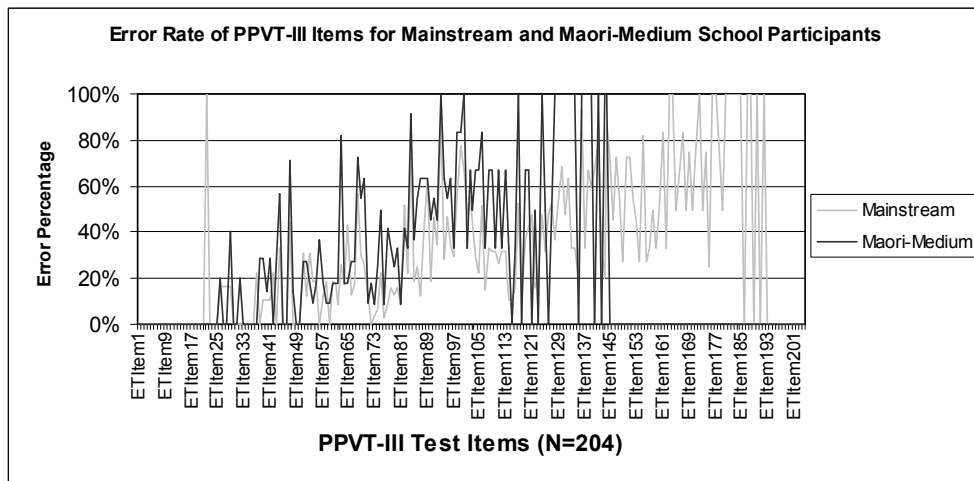


Figure 7: Error rate on PPVT-III test items made by participants attending mainstream and Māori-medium schools

Table 17: Descriptive Statistics Outlining PPVT-III Basal and Ceiling Points by School Type

		Median	Minimum	Maximum
Mainstream	Basal	61	13	85
	Ceiling	132	84	192
Māori-Medium	Basal	37	25	73
	Ceiling	96	72	144

Further analyses were conducted in an attempt to understand the extent of the differences between participants from mainstream and Māori-medium schools. PPVT-III response sheets were reviewed manually so as to identify which particular test items might be contributing to the lower scores obtained on the PPVT-III by participants attending Māori-medium schools.

Information was also collected with regards to which of the four pictures available for each item was chosen as the ‘correct’ response by participants.

This provided the basis for identifying patterns of responses to items resulting in the most errors. Qualitative descriptions of target ‘correct’ pictures were also reviewed. Table 18 presents the results from this analysis.

Items resulting in the highest error rate or with the most apparent pattern of errors were considered for participants from both school types. Table 19 provides details of these items, and presents the error rate obtained by mainstream and Māori-medium participants based on the number of children who completed each item.

Table 18: Error Analysis for Participants Attending Māori-Medium Schools (n=13)

Item #	Word	Error Rate (%)	Response to Items*				Examples of Responses to Correct Items
			1	2	3	4	
63	Luggage	9/11 (82%)	-	C	4	5	Bag, Suitcase
68	Signal	8/11 (73%)	C	2	3	3	Traffic Light
69	Squash	6/11 (55%)	2	4	-	C	Kumara
70	Globe	7/11 (64%)	1	C	5	1	Earth, World
75	Vase	6/12 (50%)	2	3	C	1	Pot
84	Wrench	11/12 (92%)	6	3	2	C	Tool, Spanner
86	Tambourine	6/11 (55%)	4	1	1	C	-
87	Palm	7/11 (64%)	C	2	-	5	Beach, Coconut Tree
88	Surprised	7/11 (64%)	2	5	-	C	Hat fell off
89	Canoe	7/11 (64%)	-	1	C	6	-
91	Clarinet	6/11 (55%)	2	2	2	C	Flute
93	Pitcher	11/11 (100%)	2	-	C	9	Jug
94	Reptile	7/11 (64%)	2	C	2	3	Crocodile
95	Polluting	6/11 (55%)	1	3	C	2	Factory
96	Vine	7/11 (64%)	C	6	1	-	-
100	Rodent	6/6 (100%)	1	3	C	2	Rat

* = For each word from the PPVT-III there are four picture choices. C relates to the correct picture choice for that particular word

Table 19: Analysis of Items with High Error Rates or Patterns Made by Participants who were Presented with the Items Attending Both Mainstream (n=33) and Māori-Medium Schools (n=13)

Item #	Word	Mainstream Group (n=33)	Māori-Medium Group (n=13)
		Error Rate %	Error Rate %
63	Luggage	82%	25%
68	Signal	73%	57%
84	Wrench	92%	74%
87	Palm	64%	13%
88	Surprised	64%	44%
89	Canoe	64%	63%
93	Pitcher	100%	85%

3.5 Participant Responses to Re-administered Correct Stimulus

3.5.1 Response Codes

Qualitative information was obtained by re-administering previously incorrect items, and by asking participants to describe the picture that

depicted the correct response to the stimulus word. This information was recorded, and later coded to provide an understanding of the reasons for participant errors. Seven codes were derived from the qualitative data, and are presented below.

No Information Given: Despite encouragement from the examiner, some children were hesitant to respond to questions about individual test items. Responses to correct stimuli were coded as ‘No Information Given’ in cases where an error was made, but no qualitative comments were provided by the child in relation to the correct stimulus.

Don’t Know: Responses were coded as ‘Don’t Know’ in cases where the child reported not knowing what the item was, or on incorrect items occurring within a ceiling set.

New Zealand Term Given Instead: At times children were able to correctly identify an item using a more common New Zealand word rather than the U.S. target term, for example calling a picture with the target word *Camcorder* a “Video camera”. In situations such as this, responses to correct stimuli were coded as ‘NZ Term Given Instead’.

Incorrect Response: Responses were coded as being an ‘Incorrect Response’ if the target picture was identified incorrectly. For example, calling a picture of a raccoon a “skunk” was deemed to be an incorrect response.

Self Correction: At times when re-administering items for analysis, children provided spontaneous self corrections by accurately identifying the target word. In cases such as this, responses were coded as a ‘Self Correction’.

Concrete Response: For all PPVT-III items, the picture plate is comprised of a correct stimulus and three decoy pictures, many of which are similar or related in some way. When children provided global rather than specific item descriptions that were true of all four pictures, responses were coded as being a ‘Concrete Response’. For example, when the target word was “wrench” and decoy pictures depicted other tools, a response of “tool” was coded as a concrete response.

Description of Picture Given: When faced with a picture of a scene rather than a single object, many children were unable to identify a single target word. When children gave an accurate description of the picture presented,

but were unable to identify the word itself, this type of response was coded as ‘Description of Picture Given’.

3.5.2 Results of Participant Responses to Correct Stimulus

Responses to re-administered items were collated for all participants, with information obtained for 1196 previously incorrect responses. Once re-administered items had been coded into each of the seven response codes, totals were collated for each of the response types. This allowed a percentage to be calculated for each response code, by dividing the individual code total with the overall total of 1196 responses. Figures 8, 9, and 10 show the proportion of responses that fell into each of the seven response codes for children by age group, gender, and school type.

3.5.3 Responses to Correct Stimulus by Age Group

A similar pattern of responding to re-administered items was observed by children across all of the age groups tested. Based on the frequencies observed, it appeared that the most common type of response was a ‘Don’t Know’ response, with a ‘Description of Picture Given’ being the second most common. Figure 8 shows the types of responses made by children on re-administered PPVT-III items from ages 5-6, 7-8, and 9-10 years.

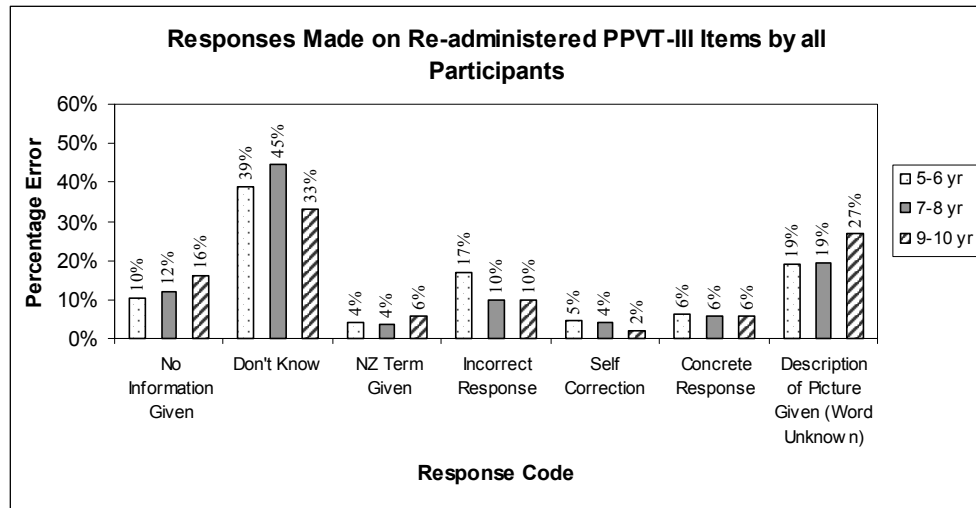


Figure 8: Responses made on re-administered PPVT-III items by participants 5-6 years (n=16), 7-8 years (n=16), 9-10 years (n=14)

3.5.4 Responses to Correct Stimulus by Gender

Comparisons were also made between the types of responses provided by male and female participants on re-administered items. The results of this analysis are presented in Figure 9. Overall, the types of responses made by male and female participants appeared to be similar, although female participants tended to respond with more ‘Description of Picture Given’ responses, and fewer ‘No Information Given’ responses.

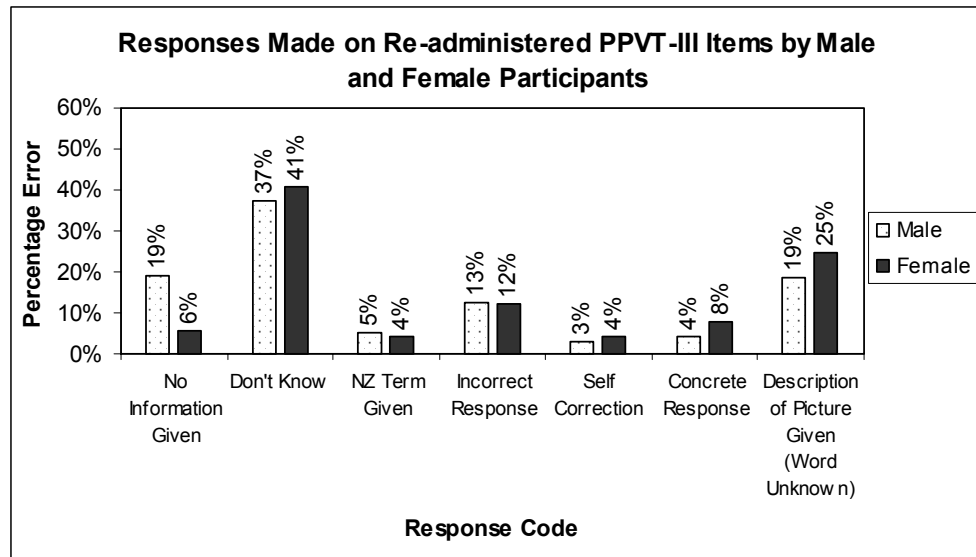


Figure 9: Responses made on re-administered PPVT-III items by male (n=24) and female (n=22) participants

3.5.5 Responses to Correct Stimulus by School Type

A similar range of responses were made by participants from both mainstream and Māori-medium schools. Figure 10 presents this information graphically. Based on the frequencies observed, it appeared that Māori-medium school participants were more likely to respond with a ‘Don’t Know’ response, and used less ‘Description of Picture Given’ responses than mainstream children.

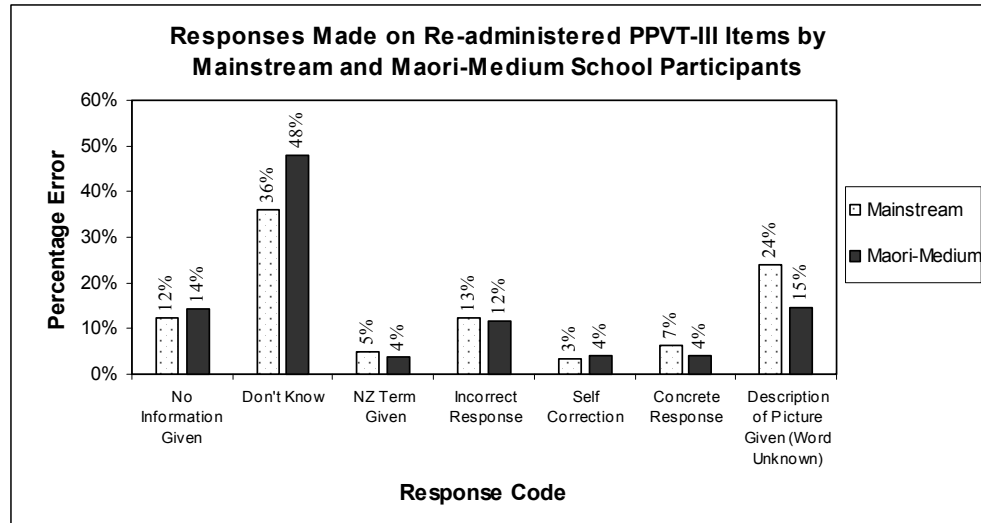


Figure 10: Responses made on re-administered PPVT-III items by mainstream (n=33) and Māori-medium school participants (n=13)

3.6 Qualitative Error Descriptions

In addition to coding participant responses to correct stimuli, qualitative information was collected in an attempt to identify themes among participant descriptions of PPVT-III items. This qualitative information was collated, and is presented in Table 20 below, along with the item number, and target word. Qualitative comments are presented for 42 test items. This information was gathered to assist with future psychometric development of the PPVT, and to provide insight into possible adjustments that could be made to the PPVT-III when working with Māori children.

Table 20: Qualitative Information Provided by Participants when asked to Identify Previously Incorrect Target Items from the PPVT-III

Item #	Target Word	Qualitative Description Provided
39	Cactus	Kumara
44	Raccoon	Skunk
47	Tearing	Ripping, Washing
53	Camper	Caravan, Ambulance
60	Dripping	Tap
61	Vehicle	Car, Van
63	Luggage	Bag, Suitcase
65	Hydrant	Water tank, For fires/firemen
68	Signal	Traffic Lights
69	Squash	Kumara, Zucchini, Avocado, Eggplant, Pinecone
70	Globe	Earth, World, Planet
74	Nostril	Nose
75	Vase	Pot, For flowers, Spitoon
78	Horrified	Frightened, Surprised, Yelling, Screaming
79	Trunk	Tree
80	Selecting	Shopping, Food, Lunch orders,
82	Camcorder	Camera, Video camera
83	Heart	Puku, Tummy, Stomach
84	Wrench	Tool, Screwdriver, Spanner
87	Palm	Beach, Tree, Coconut Tree
88	Surprised	Frightened, Shocked, Scared
89	Canoe	Rowboat, Boat, Waka, Kayak
92	Exhausted	Tired, Sleeping
93	Pitcher	Vase, Jug, Teapot
94	Reptile	Crocodile
95	Polluting	Chimney, Factory, Smoke
96	Vine	Roses, Flowers, Leaves, Garden
98	Dissecting	Frog (operating on/cutting)
99	Bouquet	Roses, Flowers
100	Rodent	Mouse, Rat
102	Valley	Farm, Village, Field
104	Demolishing	Wrecking, Smashing
108	Hurdling	Jumping, High Jump
110	Citrus	Lemon, Orange
111	Inflated	Balloon
113	Timer	Clock, Thermometer
115	Links	Chain
119	Garment	Dress
120	Fragile	Wineglass, Cup
124	Adapter	Plug, Electricity
127	Feline	Cat
128	Wailing	Crying
129	Coast	Beach
130	Appliance	Iron

Table 20 Continued: Qualitative Information Provided by Participants when asked to Identify Previously Incorrect Target Items from the PPVT-III

Item #	Target Word	Qualitative Description Provided
132	Hatchet	Axe
136	Upholstery	Couch, Sofa
138	Exterior	Door, Front door
139	Consuming	Eating, Pizza
140	Pastry	Cake, Pie
144	Colt	Calf, Pony, Springbok, Horse, Donkey
147	Ladle	Soup Spoon

3.7 Participant Impressions of the PPVT-III

3.7.1 Negative Features of the PPVT-III

At the end of test administration, all participants were asked a series of questions relating to their impressions of the PPVT-III. Questions were presented after testing to ensure that children were able to comment about all aspects of the test, and that they felt comfortable enough with the examiner to respond to questions asked. Although participants were explicitly asked to describe what they liked and disliked about the test, it was rare for children to make any negative comments. Typical responses to questions regarding the negative aspects of the test included:

“Well, I quite liked all of it [the PPVT-III]... I didn’t have any trouble. I didn’t find it not cool” (10 year old, male).

“Most of all I liked all of it” (9 year old, male).

“There wasn’t really anything I didn’t like” (9 year old, female).

“Oh, it was getting a little bit hard but I can’t really say that’s a bad thing. I don’t think there was a bad thing, people might

think that because they get stuff wrong they might over-react but... I don't think there was anything" (10 year old, male).

When critical comments were made by participants, a range of reasons were given for disliking the test. Some children reported having an aversion to specific pictures from the PPVT-III, while others were unhappy with the quality as described by one participant:

Interviewer: "What didn't you like about the test?"
"No colour" (10 year old, male).

Additional criticisms related to the difficulty of PPVT-III test items, resulting in responses such as:

"I didn't like the ones that I don't know" (5 year old, male).

"They were a little bit hard" (10 year old, female).

Children also disliked completing the error analysis component of the research which is not a usual feature of PPVT-III test administration. When asked to describe the negative aspects of the test, one child commented:

"I had to speak too long" (7 year old, female).

While another child added that they disliked it when:

"I had to say what I thought the picture was" (9 year old, male).

Over successive qualitative interviews it became apparent that many participants preferred to please the researcher by responding positively to all questions asked about the PPVT-III. In fitting with Māori process, attempts were made to increase participants' ability to critique the PPVT-III by allowing them to externalise their perceptions of the tool. In order to achieve this, participants were asked to describe what they thought other Māori children might think of the test if they were to complete it. For some children who had initially withheld negative comments, this question provided an opportunity to voice discontent with regards to aspects of the PPVT-III. When asked to report what other children might think of the PPVT-III, participants' views were captured as follows:

“Well, I think that they would think it's really really great to do” (7 year old, female).

“Mm, I think that they'll like it” (9 year old, female).

“[Other kids might find the test] a wee bit hard” (6 year old, female).

“Some Māori children will probably think [the PPVT-III] is really extreme, and if they're sad and stuff and they don't really like that much, well they might think it is a little bit okay” (8 year old, female).

“They might like it, but then they might be shy” (9 year old, female).

“Well... I think they'd like the test. But some might not like it because they get most wrong because they don't know English vocabulary” (10 year old, male).

“Some would think that they’d want to do it, and some would think that they wouldn’t want to do it I think” (5 year old, male).

While most responses tended to be either positive or negative, some children found this question difficult to answer. When asked what other Māori children might think if they were to do the test some children responded by saying:

“Don’t know” (10 year old, female).

“I don’t know... not quite sure” (6 year old, female).

“Same as me” (6 year old, male).

3.7.2 Positive Features of the PPVT-III

When exploring the positive features of the test children identified the presence of pictures, and the opportunity to answer questions as favourable components of the PPVT-III. This may have been due in part to the emphasis placed on differentiating the PPVT-III from school based tests prior to administration of the PPVT-III. Comments made by participants included:

“Well it was really cool because it was hard in some areas, but easy in other ones and I quite like visual stuff... Yeah... you could see pictures and not just having to think about it. You have this cool thing here [points to picture plate] the PPVT-III” (10 year old, male).

“What I liked most about the test was when I was answering a couple of questions that you said” (8 year old, female).

“I like how the questions... test Māori children’s vocabulary, and what they understand in English, yeah I think that’s a major role in it” (10 year old, male).

Children also reported enjoying the relative ease with which the test could be completed. As one child put it:

“[It was good that] I didn’t have to get all of [the questions] right” (7 year old, male).

While another commented:

“[It was good] that it went fast” (10 year old, male).

Children with interests in particular areas or subjects responded positively when encountering items that were familiar to them in the PPVT-III test.

This was demonstrated by one child who described enjoying the test because:

“...there was this little doggy [points to picture plate], that one, mm that’s because we’ve got a puppy” (6 year old, female).

3.7.3 Relevance of PPVT-III Pictures

Participants were asked to describe the relevance of the PPVT-III for Māori children by reporting whether there were pictures that were unfamiliar to them. Very few participants could identify all of the pictures presented to them, with most stating that there were pictures they had never seen before.

While some children enjoyed the opportunity to learn about new things in

the PPVT-III, most felt the test was made harder due to the inclusion of pictures that were not familiar to them. Typical comments included:

“Were there pictures in there that you had never seen before?”

“Yeah heaps.”

“And how did that make it for you, how did that make the game when there were pictures in there that you didn’t know?”

“Really weird. It felt like, uh oh, I need to know this, get in my head, remember it and done.” (9 year old, male).

4. Discussion

4.1 Introduction

The purpose of this study was to investigate the appropriateness of using the PPVT-III as a measure of oral language by administering the test with three different age groups of Māori children. The key objectives within the research were to examine whether there were differences between the scores obtained by Māori children on the PPVT-III, and whether Māori children's scores differed from the standardised norm group. In gauging the appropriateness of the PPVT-III, particular attention was paid to participants' comfort and engagement when tested, and the ease or difficulty with which they completed each test item, up to and beyond the ceiling point.

The results showed that the PPVT-III was largely an appropriate measure to use with Māori children – particularly for children attending mainstream schools. Amongst children attending Māori-medium schools, the results showed that the current form of the PPVT-III may not be appropriate to use when measuring overall language ability, as it provides a measure of English vocabulary development alone without considering levels of te reo Māori. As a measure of English language development alone, the results suggested a number of possible adjustments that could be made when using the PPVT-III

with Māori children in order to increase the suitability of the test. Given the diverse language experiences of children attending Māori-medium schools, the PPVT-III may be more appropriate when used as a measure of a child's stage of English language development, rather than an indicator of age equivalence.

4.2 Standard Score Comparison

4.2.1 Developmental Age Groups

While research has suggested that Māori children's reading acquisition and performance on school based tests may decline with age, there were no significant differences found between the oral language abilities of children in the current study (Westerveld & Gillon, 2001). When comparing children from each of the three age groups tested, there were no significant differences found between the mean standard scores of each group. Given the relatively small number of children in each age group, and the different characteristics of children in each sample, it is difficult to generalise from these results. In the event that 'true' differences do exist between the oral language skills of Māori children from different age groups, such differences may have been masked by the nature and size of the sample studied. After additional analyses, effect sizes were deemed large between the 5-6 and 7-8 year age group, with further investigation revealing that differences between

these groups were mostly due to school type. As more Māori-medium students involved in the study were aged between 7-8 years, factors associated with school type may have affected the overall scores for the 7-8 year old age group.

Consideration should also be given to the possible differences between measures of oral language and reading ability, when interpreting these results. While Māori children may have little difficulty acquiring oral language skills measured by the PPVT-III, reading is a complex task that requires direct instruction and the acquisition of various component skills prior to achieving reading mastery (Phillips et al., 2004). Oral language skills may be related to reading ability, but they are not necessarily measures of the same construct. Therefore, while Māori children across developmental age groups may have obtained similar scores on the PPVT-III, differences may still exist between their performances on reading based tests.

4.2.2 Gender

Research has found mixed results when comparing the performance of males and females on the PPVT-III, with most finding no significant gender differences (Restrepo et al., 2006; Washington & Craig, 1999). However, in

cases where PPVT-III scores for male and female participants have been reported, females tended to obtain higher scores than males (Washington & Craig, 1999). Gender comparisons were also not reported by PPVT-III test developers in the technical manual, leading to questions as to whether there may be a need for separate norms for male and female participants (Restrepo et al., 2006).

In contrast to previous research findings, our results revealed a significant difference between the scores of male and female participants, with males obtaining higher scores than females. This result was no longer significant after controlling for school type, although the average score for male participants remained higher despite there being no significant difference between the two groups. Given that comparison scores are not reported for males and females in the PPVT-III technical manual, it is possible that the range of items presented to the children in the age groups tested, favoured male participants in terms of item familiarity. Although male and female participants were similar in terms of demographic characteristics, it is possible that the differences found between participants may have been due to a sampling bias or through the impact of factors associated with school type.

4.2.3 School Decile

The influence of socio-economic factors on the distribution of economic, social, and political resources has been widely researched, with people from lower socio-economic groups found to experience disproportionate rates of deprivation in relation to these resources (Ministry of Health, 1999; Ministry of Health & University of Otago, 2006). While various measures of socio-economic status are available, school decile ratings were used in this study due to their relevance to the research participants who were children. Due to the small number of participants in each decile, children were sorted into three groups representing low (decile 1-3), mid (decile 4-6), and high (decile 7-10) decile schools. Standard score comparisons revealed that there were no significant differences between PPVT-III scores obtained by participants attending different decile schools. It is possible that differences may have been influenced by additional variables; however, further analyses were limited due to the small number of participants represented in the high decile range, and the absence of Māori-medium students from high decile schools. It is also possible that differences between groups may have been masked by the process of collapsing participants into low, mid, and high decile schools; however, further research with a larger sample would be required in order to establish whether differences exist.

4.2.4 Standardised Norm Group

Comparisons between Māori children who participated in the research, and the standardisation sample showed that, on average, Māori children obtained a score that was below what would be expected from a normally distributed sample. The average score obtained by all Māori participants was significantly lower than the average score from the standardisation sample. However, further analyses revealed that these differences could be largely attributed to the influence of school type.

4.2.5 School Type

While mainstream school children achieved an average that was slightly higher than the normative mean, Māori-medium school children obtained an average that was significantly lower than the normative mean, being more than one standard deviation lower than average. What remains unclear however, are the reasons for the significant differences found between Māori-medium and mainstream school children, with the potential for multiple causal factors to be involved. Causal factors that may have contributed to the discrepancy between standard scores include English language curriculum differences between mainstream and Māori-medium schools, diverse family language backgrounds and experiences, and the influence of socio-economic deprivation (Bishop et al., 2001; McNaughton

et al., 2006; Rau, 2001). As only 13 Māori-medium school children took part in the study, with none of these children attending high decile schools, possibilities for further comparative analyses were limited.

Kaupapa Māori researchers working in the area of Māori-medium education have made a number of recommendations for practitioners when working with children attending Māori-medium schools. They highlight the need to move from a focus on age based norms to stage based norms when assessing the te reo Māori abilities of Māori-medium school students (Bishop et al., 2001). This approach could also be adopted when assessing the stage of English language development of Māori-medium students, by considering children's language backgrounds and levels of exposure to the English language, as well as considering the results of more formal assessment methods (Bishop et al., 2001). Given the language demands placed on children when attempting all manner of standardised tests, these findings may imply the need for wider consideration of cultural factors when interpreting any psychometric test results for children attending Māori-medium schools.

Despite the need to utilise culturally unbiased assessment methods, Māori-medium education is still in an early stage of development, requiring clear

and relevant assessment strategies to allow teachers to recognise and tailor teaching programmes that build on children's skills and strengths (Bishop et al., 2001). Although close investigation revealed that the PPVT-III is not a culturally unbiased test as has been purported, until such time that an alternative measure becomes available, it is important to address those aspects of the test which impede the performance of Māori children (Qi et al., 2003; Stockman, 2000; Washington & Craig, 1999). It is essential that future research and educational resources are developed with a Kaupapa Māori focus to ensure the reliability, validity, and relevance of such measures; however, development can only occur at a rate permitted by available resources and workforce capacity (Rau, 2001). While comparisons between Māori-medium and mainstream education are not appropriate due to the difference in practices and underlying pedagogy, the PPVT-III could be applied differently to suit the means of both.

4.3 Administration with Māori Children

An unexpected outcome arising from the qualitative analysis and community consultation hui, was the weight that was placed on the importance of utilising a dynamic assessment approach that incorporated Māori processes. It is difficult to estimate the extent to which these results could be replicated if a standard approach to assessment were to be used. However, it is likely

that fewer participants would have chosen to take part in the study had a Māori process not been adhered to. A clear strength of the Kaupapa Māori Research approach used throughout this study was the time that was taken when meeting with participants, to establish connections and engage them in the kaupapa of the research. This enabled participants and their whānau to voice any questions or concerns they had at the outset, and by identifying connections with the researcher, established a degree of trust.

Given that for some Māori children, the PPVT-III comprised items with which they had little experience, the positioning of this test within a familiar environment assisted with the development of rapport, and facilitated the ease and comfort of participants throughout the assessment process. The use of frequent encouragement by the examiner, as well as correct pronunciation and accurate understanding of Māori words was an additional factor which at times, worked to mediate the impact of participants' lack of familiarity with the test content.

4.3.1 Administration with Māori-Medium Participants

In addition to the administration approach discussed thus far, observations and current literature provide suggestions for ways in which to maximise the performance of bilingual children on standardised assessment measures such

as the PPVT-III (Laing & Kamhi, 2003; McCloskey & Athanasiou, 2000; Phillips et al., 2004; Saenz & Huer, 2003; Tzuriel, 2000). Although a number of children reported disliking the error analysis phase of the research, this more dynamic approach to assessment provided valuable information which assisted when interpreting test results. For example, when re-administering incorrectly identified items to participants, the reasons for initial errors became clearer. In some cases, particularly with Māori-medium participants, errors were made due to a lack of exposure to more global English words that were depicted by familiar objects (e.g. the word citrus for the picture of an orange), highlighting the bias of some items towards English first language speakers.

Another useful dynamic adjustment to the standardised administration approach was the practice of testing below the basal set, and beyond the ceiling point. While for many participants, administering items below the basal set was unnecessary in terms of scoring the test, this practice enabled participants to increase their sense of efficacy as they became more familiar with testing requirements. Presenting items above the ceiling point on the PPVT-III posed more difficulties; particularly given the large number of incorrect items required before the ceiling point is reached in a set (eight out of 12 items incorrect). Had all participants completed one or two sets above

their ceiling point, this would have enabled score adjustments to be made in response to problematic items or self-corrections made during re-administration of incorrect items.

As well as utilising more dynamic assessment techniques, Māori-medium students benefited when attention was given to the manner in which PPVT-III words and instructions were delivered. Encouraging and responding to Māori-medium participants' use of te reo helped to facilitate their level of comfort and engagement with the assessment experience, despite any lack of familiarity with test material. Ensuring participants had an accurate understanding of each word presented was also essential in order to maximise test validity, with specific techniques employed including word repetition, and clearly modelled word production by facing participants and enunciating the syllables in each word.

4.4 Error Analysis

In considering the suitability of the PPVT-III for use with Māori children, close attention was paid to the difficulty or ease with which individual items were completed. For all participants, regardless of age, gender, or school type, there were a number of words and pictures that proved to be consistently challenging. On closer examination of these items, it was

discovered that they tended to characterise concepts or images more frequently encountered in the U.S.A than in New Zealand.

Table 20 provides qualitative comments with regards to 42 PPVT-III items that resulted in incorrect responses after re-administration. According to PPVT-III test developers, individual item analysis and review was conducted as part of the standardisation process, with biased words and pictures being removed and difficult items re-positioned to a later point in the test as a result (Dunn & Dunn, 1997; Williams & Wang, 1997). It is possible that when administering the test with Māori children, some items may have posed difficulties due to the inclusion of culturally biased concepts or images that would not have been apparent when administered with an American sample. With further study, adjustments may be made to improve the familiarity and cultural appropriateness of PPVT-III content for use with Māori children.

4.4.1 Adjustments to Culturally Biased Items

Although additional research would be required to investigate the impact of introducing new PPVT-III test items, a number of preliminary adjustments could be made to items that currently pose difficulties due to their representation of culturally biased words and images. While the current

study reviewed the performance of tamariki aged between 5 years and 10 years 9 months on the PPVT-III, there are items that appear at earlier points in the test which may also require adjustments when working with tamariki under 5 years of age. In particular, items 7 (target word Closet) and 23 (target word Garbage) could be adjusted when administering the PPVT-III with younger Māori children, by presenting the words Wardrobe and Rubbish in their place.

On review of the items presented to participants in the current study, a number of adjustments could be made to minimise the impact of cultural bias by replacing some existing words and pictures from the PPVT-III with equivalent concepts that are more familiar to Māori children. At present, several items included in the PPVT-III relate to, or depict images of animals that are not commonly seen in New Zealand. For example, item 29 (target word Porcupine) and item 44 (target word Raccoon) could be replaced by pictures and names of animals that are encountered more frequently by Māori children. For instance, while the target word Porcupine could be replaced by a word such as Hedgehog, Raccoon could be replaced by a word such as Possum.

After analysing the qualitative comments offered by participants in response to several incorrectly identified items, a range of alternative New Zealand terms describing the target picture were provided. Item 53 (target word camper) was described as being a Caravan by a number of children, highlighting the need to adjust either the target picture or word. Alternative words that may be more appropriate when presenting the same image to Māori children could include either Caravan or Campervan, with Campervan being the closer representation of the current target picture. Item 63 (target word Luggage) also posed problems for a number of Māori participants, with Baggage providing a closer representation of New Zealand terminology. When describing the target image depicted by item 68 (target word Signal) most tamariki used the term Traffic Lights. Future amendments to the PPVT-III could use the term Lights in place of the word Signal when working with Māori children. Tamariki also provided alternative words for items 82 (target word Camcorder), 84 (target word Wrench), and 93 (target word Pitcher). While the image depicting the target word Camcorder was described by Māori children as a Video camera, Wrench was more commonly associated with the word Spanner, and Pitcher was described as a Jug. Future research could trial the use of these alternative terms in order to improve the content validity of the PPVT-III for use with Māori children.

In addition to challenges brought about by the use of unfamiliar terms, some items resulted in high error rates due to their depiction of images not commonly seen in a New Zealand context. For example, item 65 (target word Hydrant) depicted an image of an American steel fire hydrant, while the target picture for item 69 depicted an image of the vegetable squash not often seen in New Zealand grocery stores. When re-administering item 69 (target word Squash) to Māori participants, the image was described as being a Kumara, Zucchini, Avocado, Eggplant, or Pinecone. Future adaptations of the PPVT-III for use with Māori children could trial the use of more familiar alternative terms and images, such as Post-box and Pumpkin, to replace items 65 and 69.

After reviewing the responses provided by Māori-medium participants (as shown in Table 18) to PPVT-III items producing high error rates, it became apparent that not all target and decoy pictures were functioning effectively. According to PPVT-III test developers, decoy pictures were intended to act as neutral distracters, with no single decoy designed to be more or less attractive or misleading than others (Williams & Wang, 1997). Items 88 (target word Surprised) and 89 (target word Canoe) may be improved for use with Māori by developing an alternative set of picture plates. Close investigation of participant responses revealed that many children who

responded incorrectly to items 88 and 89, had chosen the same decoy image. This suggests that the decoy images did not allow Māori children to discriminate easily between correct and incorrect choices. As well as improving the precision of target and decoy images, future versions of the PPVT-III may also consider updating the picture plates in order to improve their overall relevance and visual appeal.

4.4.2 Responses to Re-administered Items

After reviewing the reasons for participant errors through the re-administration of incorrectly identified items, it appears that most participant errors occurred in response to items that were unknown to them. Of the seven response codes arising from participants' qualitative comments, four response types ('Don't Know', 'Description of Picture Given', 'No Information Given', and 'Incorrect Response') tended to suggest that an error was made due to a lack of familiarity with test material. What is not clear however, are the reasons that these items were unknown to participants, with further research required in order to gauge whether PPVT-III items are currently ordered in a difficulty hierarchy that matches the experience of Māori children. On review of the Error Rate obtained by participants on PPVT-III items, although there was an overall trend of increasing difficulty as the test progressed there were points at which some items resulted in sharp

fluctuations of error. There were limitations as to the type of error analysis that could be conducted, with further research requiring larger groups of participants to complete all of the PPVT-III items in order to identify points in the test where items may be biased or incorrectly placed.

Items resulting in high error rates tended to be either unknown to participants', or were placed at points in the test where fewer children were able to complete them. In comparison, items producing lower error rates often appeared early on in test administration, and may have represented words, concepts and pictures that were more familiar to Māori participants. Another factor potentially influencing the ease or difficulty with which individual items were completed relates to the effectiveness of the three decoy pictures. It is possible that 'easier' items may have been grouped among less effective decoy pictures, with the result being that seemingly difficult words became easier to respond to by using a process of elimination to identify the correct picture. In contrast, 'difficult' items may have been grouped among more effective or ambiguous decoy pictures making it harder to select the correct picture from the three decoys.

4.5 Implications of the Research Results

Although non-parametric sampling methods such as those employed in this study have been criticised in the past for producing research that can not be generalised, the research sample who took part in this study were found to closely match the wider population of Māori residing in Canterbury and New Zealand on a number of strata. As a result, this finding has implications regarding the appropriateness of using a standard approach to test administration when working with Māori, particularly when using psychometric tests developed outside of New Zealand. Although standardised test administration procedures are provided with the intention of minimising the effects of bias introduced by examiner variation, adherence to procedures that do not prioritise Māori beliefs, values, and experiences may disadvantage Māori children. Given that the PPVT-III was thought to be a relatively unbiased test, the continued unadjusted use of psychometric tools with Māori that are based on concepts with a known cultural loading is a questionable practice.

4.6 Limitations of the Research

While every effort was been made to ensure the representativeness of the research sample, non-parametric sampling methods such as those employed

in this study have been criticised for producing results that cannot be generalised. Despite this criticism, a number of researchers have emphasised the utility of such methods when recruiting highly defined and representative minority samples (Clay et al., 2003; Patrick, Pruchno, & Rose, 1998; Perkins, Devlin, & Hansen, 2004).

Detailed analyses of the results revealed the diverse characteristics of the research sample in terms of demographic and developmental backgrounds. While all of the children who took part in the research were described by their parents as typically developing children, a small number of participants had experienced trauma and adversity in their early life. High rates of attendance at early childhood services among participants also represented a deviation from what would be expected in the wider population given the lower rates of participation in early childhood education by Māori children overall (Ministry of Education, 2003b, 2005). Despite these differences, the research sample bore close resemblance to the wider population on all other measures and strata utilised.

Differences were also discovered between the characteristics of participants attending mainstream and Māori-medium schools. In addition to the small sample size of Māori-medium school participants, differences were noted in

terms of the distribution of participants by gender and school decile rating. Kaupapa Māori education researchers also highlight the need to consider the different language and cultural backgrounds of children attending Māori-medium schools, with many acknowledging that the diversity within groups of Māori-medium students is much greater than the diversity within children attending mainstream schools (Bishop et al., 2001; Crombie et al., 2000; McNaughton et al., 2006; Rau, 2001).

Small sample sizes also limited the range of analyses that were possible. In addition to the small number of participants attending Māori-medium schools, there were inadequate numbers of participants overall to allow more comprehensive error analyses to be conducted. For example, Rasch scaling methods employed by PPVT-III test developers require at least 100 participants to complete all test items in order to identify points at which an item may be functioning differently in relation to the entire item pool (Williams & Wang, 1997).

Given that the focus of this research was to investigate the suitability of using the PPVT-III with Māori children, all of the participants who took part in the study identified as Māori. While it is possible that difficulties may arise when administering the PPVT-III with non-Māori children, further

research is required in order to establish what, if any adjustments could be made to the PPVT-III for use with non-Māori children.

4.7 Future Research

Future research considering the suitability of the PPVT-III for use with Māori children could investigate the impact of adjustments to standardised administration by comparing the standard scores obtained by Māori children assessed with and without adherence to a dynamic assessment approach. Dynamic assessment techniques could include testing below and above standard basal and ceiling points, re-administering previously incorrect items, and other dynamic techniques such as *test-teach-retest* (McCloskey & Athanasiou, 2000; Phillips et al., 2004; Saenz & Huer, 2003; Tzuriel, 2000). In addition, further testing with a larger sample of Māori children would allow for the utility of possible adjustments to the PPVT-III words or pictures to be tested, and after successful pilot testing, re-normed specifically for use with Māori. Future research could also consider the functioning of individual PPVT-III test items in an attempt to ascertain whether the item difficulty hierarchy reflects the experiences of Māori children. Additional research may also consider including a non-Māori group of participants to identify the suitability of the PPVT-III for use within a New Zealand setting.

4.8 Conclusions and Recommendations

Accurate and unbiased assessment is an essential requirement when identifying difficulties, and providing interventions capable of responding to the needs of Māori. While work continues towards the development of culturally unbiased assessment tools that are based on Māori concepts and experiences, the majority of practitioners and tools currently available to work with Māori clients do not operate from a Māori perspective.

The main aim of this study was to investigate the suitability of using one measure, the Peabody Picture Vocabulary Test – III (PPVT-III), with Māori children. Findings revealed that although the PPVT-III was not completely free of bias, it appeared to be largely suitable when used with Māori children. However, due to the diverse language and cultural backgrounds of Māori children, it was discovered that flexible adjustments to the standardised administration approach improved the suitability of the test for many participants. These adjustments involved utilising a more dynamic assessment approach, and prioritising Māori beliefs, values, and experiences throughout test administration.

While Māori children attending mainstream schools produced PPVT-III results which mirrored those of the standardisation sample, children

attending Māori-medium schools produced scores that were more indicative of their stage of English language development rather than their overall language ability. In fitting with recommendations made by researchers working in the area of Māori-medium education, the PPVT-III could continue to be used, but in a manner that understands and addresses the needs of Māori-medium students. In doing so, the PPVT-III could be utilised to assist with teaching interventions when introducing English as a subject with Māori-medium students, or to gauge the stage of language development of new students with diverse language backgrounds.

In conclusion, this research shows that culture plays an important role in the ways in which people respond to standardised assessment. One cannot assume that a test developed based on concepts and ideals valued by one culture will translate equally to another. Arising from this research, the following recommendations were made:

- When administering the PPVT-III with Māori children, the approach to assessment is an important component which is likely to influence test performance. While care must be taken not to detrimentally affect test results by deviating from standardised administration, assessment approaches that encompass Māori beliefs, values, and experiences will improve the appropriateness of the test when used with Māori.

- The PPVT-III may be used with Māori children attending both mainstream and Māori-medium schools. While the PPVT-III was found to provide a useful indicator of age equivalence when used with mainstream Māori children, it provided a more accurate measure of the stage of English language development achieved when used with children attending Māori-medium schools. Any assessment undertaken with Māori children should consider the influence of language background and cultural experiences when interpreting test results.
- More research with a larger sample of Māori children is required in order to investigate the impact of adjusting ‘problematic’ items in the current version of the PPVT-III. Future research could consider the influence of dynamic assessment approaches on the test scores of Māori children and the development of Māori norms based on a validation study.

5. References

- Ajwani, S., Blakely, T., Robson, B., Atkinson, J., & Kiro, C. (2003). Unlocking the numerator-denominator bias. III: adjustment ratios by ethnicity for 1981-1999 mortality data. The New Zealand Census-Mortality Study. *The New Zealand Medical Journal*, 116 (1175), 39-43.
- Baker, M., Martin, D., Kieft, C., Jones, N., & Lennon, D. (1999). The evolving meningococcal disease epidemic in New Zealand. *New Zealand Public Health Report*, 6 (8), 57-61.
- Barker-Collo, S. L. (2003). Culture and validity of the Symptom Checklist-90-Revised and Profile of Mood States in a New Zealand student sample. *Cultural Diversity and Ethnic Minority Psychology*, 9 (2), 185-196.
- Baxter, J., Kingi, T. K., Tapsell, R., & Durie, M. (2006). Māori. In M. A. Oakley Browne, J. E. Wells & K. M. Scott (Eds.), *Te Rau Hinengaro: The New Zealand Mental Health Survey*. Wellington: Ministry of Health.
- Beautrais, A. L. (2001). Child and young adolescent suicide in New Zealand. *Australian and New Zealand Journal of Psychiatry*, 35 (55), 647-653.
- Beautrais, A. L., Wells, J. E., McGee, M. A., & Oakley Browne, M. A. (2006). Suicidal behaviour in Te Rau Hinengaro: The New Zealand Mental Health Survey. *Australian and New Zealand Journal of Psychiatry*, 40, 896-904.
- Bishop, R., Berryman, M., & Richardson, C. (2001). *Te Toi Huarewa. Effective teaching and learning strategies, and effective teaching materials for improving the reading and writing in te reo Māori of students aged five to nine in Māori-medium education*. Wellington: Ministry of Education.
- Blakely, T., Kiro, C., & Woodward, A. (2002). Unlocking the numerator-denominator bias. II: adjustments to mortality rates by ethnicity and deprivation during 1991-94. The New Zealand Census-Mortality Study. *The New Zealand Medical Journal*, 115 (1148), 43-48.

- Blakely, T., Robson, B., Atkinson, J., Sporle, A., & Kiro, C. (2002). Unlocking the numerator-denominator bias. I: adjustments ratios by ethnicity for 1991-94 mortality data. The New Zealand Census-Mortality Study. *The New Zealand Medical Journal*, *115* (1147), 39-43.
- Blakely, T., Robson, B., & Woodward, A. (2002). Measuring Māori health status accurately - more needs doing. *The New Zealand Medical Journal*, *115* (1151), 149-150.
- Bryson, J., & Hosken, C. (2005). What does it mean to be a culturally competent I/O psychologist in New Zealand? *New Zealand Journal of Psychology*, *34* (2), 69-76.
- Clay, C., Ellis, M. A., Amodeo, M., Fassler, I., & Griffin, M. L. (2003). Recruiting a community sample of African American subjects: the nuts and bolts of a successful effort. *Families in Society*, *84* (3), 396.
- Crombie, W., Houia, W., & Reedy, T. (2000). Issues in testing the proficiency of learners of indigenous languages: an example relating to young learners of Māori. *Journal of Māori and Pacific Development*, *1* (1), 10-26.
- Deane, F. P., Skogstad, P., & Williams, M. W. (1999). Impact of attitudes, ethnicity and quality of prior therapy on New Zealand male prisoners' intentions to seek professional psychological help. *International Journal for the Advancement of Counselling*, *21*, 55-67.
- Dunn, L. M., & Dunn, L. M. (1997). *Examiner's Manual for the PPVT-III*. Minnesota: American Guidance Service.
- Durie, M. (1998). *Whaiora: Māori Health Development* (2nd ed.). Auckland: Oxford University Press.
- Durie, M. (1999a). Marae and implications for a modern Māori psychology. *Journal of the Polynesian Society*, *108* (4), 351-366.
- Durie, M. (1999b). Mental health and Māori development. *Australian and New Zealand Journal of Psychiatry*, *33*, 5-12.
- Durie, M. (2001). *Mauri Ora: The Dynamics of Māori Health*. Auckland: Oxford University Press.

- Dyall, L., Bridgman, G., Bidois, A., Gurney, H., Hawira, J., Tangitu, P., et al. (1999). Māori outcomes: expectations of mental health services. *Social Policy Journal of New Zealand*, 12, 71-89.
- Giles, M., & Asher, I. (1991). Prevalence and natural history of otitis media with perforation in Māori school children. *The Journal of Laryngology and Otology*, 105, 257-260.
- Glover, M. (2005). Analysing smoking using Te Whare Tapa Wha. *New Zealand Journal of Psychology*, 34 (1), 13-19.
- Glover, M., & Robertson, P. (1997). Facilitating development of kaupapa Māori psychology. In H. Love & W. Whittaker (Eds.), *Practice Issues for Clinical and Applied Psychologists in New Zealand* (Vol. 1, pp. 136-146). Wellington: The New Zealand Psychological Society.
- Grigg, M., & Macrae, B. (2000). *Tikanga, Oranga, Hauora*. Wellington: Te Puni Kokiri.
- Harris, R., Tobias, M., Jeffreys, M., Waldegrave, K., Karlsen, S., & Nazroo, J. (2006). Effects of self-reported racial discrimination and deprivation on Māori health and inequalities in New Zealand: cross-sectional study. *The Lancet*, 367 (9527), 2005-2009.
- Hirini, P. (1997). Counselling Māori clients: he whakawhiti nga whakaaro i te tangata whaiora Māori *New Zealand Journal of Psychology*, 26 (2), 13-18.
- Hirini, P., Flett, R., & Long, N. (2005). Frequency of traumatic events, physical and psychological health among Māori *New Zealand Journal of Psychology*, 34 (1), 20-27.
- Hohepa, M., & McNaughton, S. (1993). Tikanga a Rangahau: Nga Mahi Hahu - Practices of Research. *Bulletin*, 76, 40-43.
- Howden-Chapman, P., & Tobias, M. (2000). *Social Inequalities in Health: New Zealand 1999*. Wellington: Ministry of Health.
- Huriwai, T., Sellman, J. D., Sullivan, P., & Potiki, T. (2000). Optimal treatment for Māori with alcohol and drug-use-related problems: an investigation of cultural factors in treatment. *Substance Use & Misuse*, 35 (3), 281-300.

- Ihimaera, L. V., & Tassell, N. A. (2004). *Clinical Placement Guidelines for Māori Tertiary Students*. Palmerston North: Te Rau Matatini.
- Johnstone, K., & Read, J. (2000). Psychiatrists' recommendations for improving bicultural training and Māori mental health services: a New Zealand survey. *Australian and New Zealand Journal of Psychiatry*, 34, 135-145.
- Keefe, V., Ormsby, C., Robson, B., Reid, P., Cram, F., & Purdie, G. (1999). Kaupapa Māori meets retrospective cohort. *He Pukenga Kōrero*, 5 (1), 12-17.
- Laing, S. P., & Kamhi, A. (2003). Alternative assessment of language and literacy in culturally and linguistically diverse populations. *Language, Speech & Hearing Services in Schools*, 34, 44-55.
- Levy, M. (2002). *Barriers and Incentives to Māori Participation in the Profession of Psychology*. Hamilton: New Zealand Psychologists' Board; Māori and Psychology Research Unit, University of Waikato.
- Mantell, C. D., Craig, E. D., Stewart, A. W., Ekeroma, A. J., & Mitchell, E. A. (2004). Ethnicity and birth outcome: New Zealand trends 1980-2001: part 2. Pregnancy outcomes for Māori women. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 44 (4), 537-540.
- Maynard, K. (1999). Kimihia: Māori culture-related needs - seeking more effective ways to assess and address Māori offending. *He Pukenga Kōrero*, 5 (1), 25-33.
- McCloskey, D., & Athanasiou, M. S. (2000). Assessment and intervention practices with second-language learners among school psychologists. *Psychology in the Schools*, 37 (3), 209-225.
- McFarlane-Nathan, G. (1999). *Framework for Reducing Māori Offending: How to Achieve Quality in Policy and Services to Reduce Māori Offending and Enhance Māori Aspirations*. Wellington: Psychological Service, Department of Corrections.
- McNaughton, S., MacDonald, S., Barber, J., Farry, S., & Woodard, H. (2006). *Ngā Taumatua: Research on Literacy Practices and*

Language Development (Te Reo) in Years 0-1 in Māori Medium Classrooms. Wellington: Ministry of Education.

Medical Council of New Zealand. (2006). Statement on best practices when providing care to Māori patients and their whānau. Retrieved 17 June, 2006, from www.mcnz.org.nz

Ministry of Education. (2003a). *Education Priorities for New Zealand:* Ministry of Education.

Ministry of Education. (2003b). *Ngā Haeata Mātauranga: Annual Report on Māori Education 2002/2003.* Wellington: Ministry of Education.

Ministry of Education. (2005). *Ngā Haeata Mātauranga: Annual Report on Māori Education 2005.* Wellington: Ministry of Education.

Ministry of Education. (2006). Deciles Information. Retrieved 26 January, 2007, from <http://www.minedu.govt.nz/index.cfm?layout=document&documentid=7693>

Ministry of Health. (1998). *Our Children's Health: Key Findings on the Health of New Zealand Children.* Wellington: Ministry of Health.

Ministry of Health. (1999). *Our Health, Our Future: The Health of New Zealanders 1999.* Wellington: Ministry of Health.

Ministry of Health. (2002a). *He Korowai Oranga: Māori Health Strategy.* Wellington: Ministry of Health.

Ministry of Health. (2002b). *Te Puawaitanga Māori Mental Health National Strategic Framework.* Wellington: Ministry of Health.

Ministry of Health. (2002c). *Whakatātaka: Māori Health Action Plan 2002-2005.* Wellington: Ministry of Health.

Ministry of Health. (2004). *Ethnicity Data Protocols for the Health and Disability Sector.* Wellington: Ministry of Health.

Ministry of Health. (2006a). *Report on Maternity: Maternal and Newborn Information 2003.* Wellington: Ministry of Health.

Ministry of Health. (2006b). *Suicide Facts: 2004-2005 Data.* Wellington: Ministry of Health.

- Ministry of Health, & University of Otago. (2006). *Decades of Disparity III: Ethnic and socio-economic inequalities in mortality, New Zealand 1981-1999*. Wellington: Ministry of health.
- Mitchell, E. A., & Thompson, J. M. D. (2001). Parental reported apnoea, admissions to hospital and sudden infant death syndrome. *Acta Paediatrica*, *90*, 417-422.
- Mitchell, E. A., Tuohy, P. G., Brunt, J. M., Thompson, J. M. D., Clements, M. S., Stewart, A. W., et al. (1997). Risk factors for sudden infant death syndrome following the prevention campaign in New Zealand: a prospective study. *Pediatrics*, *100* (5), 835-839.
- Murphy, F., White, S., & Morreau, P. (2002). Driveway-related motor vehicle injuries in the paediatric population: a preventable tragedy. *The New Zealand Medical Journal*, *115* (1160), 1-7.
- Ngata, P., & Pomare, E. (1992). Cultural factors in medicine taking: A Māori perspective. *New Ethical Journal*, *29*, 43-50.
- O'Connor, M., & Macfarlane, A. (2002). New Zealand Māori stories and symbols: family value lessons for western counsellors. *International Journal for the Advancement of Counselling*, *24* (4), 223-227.
- Ogden, J. A. (2003). Adapting neuropsychological assessments for minority groups: a study comparing white and Māori New Zealanders. *Brain Impairment*, *4* (2), 122-134.
- Ogden, J. A., & McFarlane-Nathan, G. (1997). Cultural bias in the neuropsychological assessment of young Māori men. *New Zealand Journal of Psychology*, *26* (2), 2-12.
- Orange, C. (1987). *The Treaty of Waitangi*. Wellington: Bridget Williams Books Limited.
- Padilla, Y. C., Boardman, J. D., Hummer, R. A., & Espitia, M. (2002). Is the Mexican American "epidemiologic paradox" advantage at birth maintained through early childhood? *Social Forces*, *80* (3), 1101-1123.
- Palmer, S. (2004). Hōmai te Waiora ki Ahau: A tool for the measurement of wellbeing among Māori - the evidence of construct validity. *New Zealand Journal of Psychology*, *33* (2), 50-58.

- Palmer, S. (2005). Psychometrics: an ancient construct for Māori *New Zealand Journal of Psychology*, 34 (1), 44-51.
- Patrick, J. H., Pruchno, R. A., & Rose, M. S. (1998). Recruiting research participants: a comparison of the costs and effectiveness of five recruitment strategies. *The Gerontologist*, 38 (3), 295-302.
- Perkins, M. R. V., Devlin, N. J., & Hansen, P. (2004). The validity and reliability of EQ-5D health state valuations in a survey of Māori. *Quality of Life Research*, 13 (1), 271-274.
- Phillips, G., McNaughton, S., & MacDonald, S. (2004). Managing the mismatch: enhancing early literacy progress for children with diverse language and cultural identities in mainstream urban schools in New Zealand. *Journal of Educational Psychology*, 96 (2), 309-323.
- Pihama, L., Cram, F., & Walker, S. (2002). Creating methodological space: a literature review of kaupapa Māori Research. *Canadian Journal of Native Education*, 26 (1), 30-43.
- Pitama, S., Robertson, P., Gillies, M., Baxter, J., Ahuriri-Driscoll, A., Haitana, T., et al. (2003). *Focussing on Ngai Tahu 2025: The Ngati Wheke Pilot*. Christchurch: Ngai Tahu Development Corporation.
- Ponga, L. N., Maxwell-Crawford, K. M., Ihimaera, L. V., & Emery, M. A. (2004). *Macro-analysis of the Māori Mental Health Workforce*. Palmerston North: Te Rau Matatini.
- Qi, C., Kaiser, A. P., Milan, S. E., Yzquierdo, Z., & Hancock, T. B. (2003). The performance of low-income African American children on the Preschool Language Scale - 3. *Journal of Speech, Language, and Hearing Research*, 46 (3), 576-590.
- Rau, C. (2001). *He Ara Angitu: A Pathway to Success*. Paper presented at the Ministry of Education Assessment Hui. Retrieved 13 December, 2007, from <http://www.kiaatamai.org.nz/angitu/pg04.htm>
- Reese, E., & Cox, A. (1999). Quality of adult book reading affects children's emergent literacy. *Developmental Psychology*, 35 (1), 20-28.
- Reese, E., & Read, S. (2000). Predictive validity of the New Zealand MacArthur Communicative Development Inventory: Words and Sentences. *Journal of Child Language*, 27, 255-266.

- Reid, P. (1999a). Ngā mahi whakahaehae a te tangata tiriti. In P. Davis & K. Dews (Eds.), *Health and Society in Aotearoa New Zealand* (pp. 83-94). Auckland: Oxford University Press.
- Reid, P. (1999b). Te pupuri i te ao o te tangata whenua. In P. Davis & K. Dew (Eds.), *Health and Society in Aotearoa New Zealand* (pp. 51-62). Auckland: Oxford University Press.
- Restrepo, M. A., Schwanenflugel, P. J., Blake, J., Neuharth-Pritchett, S., Cramer, S. E., & Ruston, H. P. (2006). Performance on the PPVT-III and the EVT: applicability of the measures with African American and European American preschool children. *Language, Speech & Hearing Services in Schools, 37* (1), 17-27.
- Robertson, P. (2005). Kōrero Te Hīkoi: Māori Men Talk the Walk of Addiction Treatment: Christchurch School of Medicine and Health Science, University of Otago. Unpublished PhD Thesis.
- Robertson, P., Pitama, S., Huriwai, T., Ahuriri-Driscoll, A., Haitana, T., Larsen, J., et al. (2005). Developing services in te rohe o Ngai Tahu for Māori with gambling related problems. *New Zealand Journal of Psychology, 34* (1), 35-43.
- Rock, D. A., & Stenner, J. (2005). Assessment issues in the testing of children at school entry. *The Future of Children, 15* (1), 15-34.
- Saenz, T. I., & Huer, M. B. (2003). Testing strategies involving least biased language assessment of bilingual children. *Communication Disorders Quarterly, 24* (4), 184-193.
- Sattler, J. M. (2001). Useful statistical and measurement concepts. In *Assessment of Children: Cognitive Applications* (4 ed., pp. 86-127). California: Jerome M. Sattler, Publisher, Inc.
- Scott, K. M., Sarfati, D., Tobias, M. I., & Haslett, S. J. (2000). A challenge to the cross-cultural validity of the SF-36 health survey: factor structure in Māori, Pacific and New Zealand European ethnic groups. *Social Science and Medicine, 51*, 1655-1664.
- Shepherd, I., & Leathem, J. (1999). Factors affecting performance in cross-cultural neuropsychology: From a New Zealand bicultural

- perspective. *Journal of the International Neuropsychological Society*, 5, 83-84.
- Simon, J., & Smith, L. T. (Eds.). (2001). *A Civilising Mission? Perceptions and Representations of the New Zealand Native Schools System*. Auckland: Auckland University Press.
- Simpson, S., & Tapsell, R. (1999). Māori mental health: issues for the clinician. *New Ethicals Journal*, February.
- Singleton, R. A., Straits, B. C., & Straits, M. M. (1993). *Approaches to Social Research* (2nd ed.). New York: Oxford University Press.
- Smith, L. (1999a). *Decolonizing Methodologies: Research and Indigenous Peoples*. Dunedin: University of Otago Press.
- Smith, L. (1999b). Kaupapa Māori methodology: our power to define ourselves. Retrieved 10 November, 2006, from <http://www.hauora.com/downloads/files/ACF30AC.pdf>
- Solarsh, B., & Alant, E. (2006). The challenge of cross-cultural assessment - The Test of Ability to Explain for Zulu-speaking Children. *Journal of Communication Disorders*, 39, 109-138.
- Statistics New Zealand. (1998). *Children*. Wellington: Statistics New Zealand.
- Statistics New Zealand. (2001). *Tamariki: Canterbury and West Coast Regions*. Wellington: Statistics New Zealand.
- Statistics New Zealand. (2002). *2001 Census of Population and Dwellings: Māori* (No. 02.217.0001). Wellington: Statistics New Zealand.
- Stevenson, B. (2004). Te hoe nuku roa: a measure of Māori cultural identity. *He Pukenga Kōrero*, 8 (1), 37-45.
- Stockman, I. J. (2000). The new Peabody Picture Vocabulary Test-III: an illusion of unbiased assessment? *Language, Speech & Hearing Services in Schools*, 31 (4), 340-353.
- Te Puni Kōkiri. (2000). The Māori Language and Education. *Fact Sheet:8* Retrieved 21 November, 2006, from <http://www.tpk.govt.nz/maori/language/fs8language.pdf>

- Thomson, W. M., Williams, S. M., Dennison, P. J., & Peacock, D. W. (2002). Were NZ's structural changes to the welfare state in the early 1990s associated with a measurable increase in oral health inequalities among children? *Australian and New Zealand Journal of Public Health, 26* (6), 525-530.
- Tipene-Leach, D. (1998). Māori medicines. *New Zealand Pharmacy, 18* (8), 26-28.
- Tyrrell, V. J., Richards, G. E., Hofman, P., Gillies, G. F., Robinson, E., & Cutfield, W. S. (2001). Obesity in Auckland school children: a comparison of the body mass index and percentage body fat as the diagnostic criterion. *International Journal of Obesity, 25*, 164-169.
- Tzuriel, D. (2000). Dynamic assessment of young children: educational and intervention perspectives. *Educational Psychology Review, 12* (4), 385-435.
- Walker, L., Merry, S., Watson, P. D., Robinson, E., Crengle, S., & Schaaf, D. (2005). The Reynolds Adolescent Depression Scale in New Zealand adolescents. *Australian and New Zealand Journal of Psychiatry, 39*, 136-140.
- Washington, J. A., & Craig, H. K. (1999). Performances of at-risk, African American preschoolers on the Peabody Picture Vocabulary Test-III. *Language, Speech & Hearing Services in Schools, 30* (1), 75-82.
- Westerveld, M., & Gillon, G. (2001). Oral language sampling in 6-year-old New Zealand children from different cultural backgrounds. *New Zealand Journal of Speech-Language Therapy, 56*, 5-17.
- Williams, K. T., & Wang, J. (1997). *Technical References to the Peabody Picture Vocabulary Test - Third Edition*. Minnesota: American Guidance Service, Inc.
- Wright, D. G. (1997). *Report to the Mental Health Commission for the Blueprint*. Wellington: Mental Health Commission.
- Zaslow, M. J., Oldham, E., Moore, K. A., & Magenheimer, E. (1998). Welfare families' use of early childhood care and education programs, and implications for their children's development. *Early Childhood Research Quarterly, 13* (4), 535-563.

6. Appendices

6.1 Appendix A: Participant Screening Measure

SCREENING MEASURE

Testing Tamariki: "How Suitable is the PPVT-III?"



1. What is your child's DOB? _____ (Day; Month; Year)

2. What age group does your child fit into:

- Between 5 – 6 years old
- Between 7 – 8 years old
- Between 9 – 10 years old

3. Which ethnic group or groups does your child belong to?
Mark the space or spaces which apply to your child.

- NZ European
- Māori
- Samoan
- Cook Island Māori
- Tongan
- Niuean
- Chinese
- Indian
- Other (such as DUTCH, JAPANESE, TOKELAUAN).

Please state: _____

4. Does your child have any problems with their hearing? YES/NO

5. Does your child have any problems with their vision? YES/NO

6. Is your child a competent speaker of the English language? YES/NO

6.2 Appendix B: Scoping Survey

SCOPING SURVEY

Testing Tamariki: "How Suitable is the PPVT-III?"



1. What is your current job position? _____

2. What is the name of the agency that you work for? _____

3. Do you use the Peabody Picture Vocabulary Test III? YES/NO

4. When do you use the Peabody Picture Vocabulary Test III?
(Please tick the box or boxes that apply to you)

- As a standard test for every referral.
- During the initial assessment process.
- To measure intervention progress.
- At end of intervention.
- Other. Please state: _____

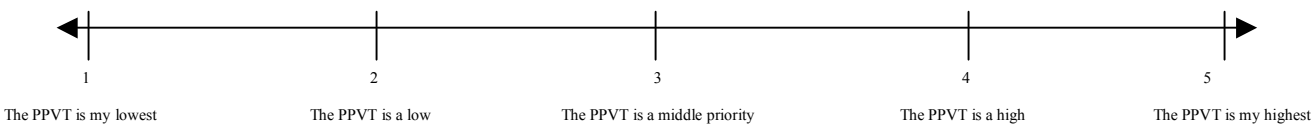
5. How often do you use the Peabody Picture Vocabulary Test III?
(Please tick the box that applies to you)

- With every child that I see.
- With most of the children I see.
- With those children for which it is most relevant.
- With some of the children I see.
- I never use the PPVT-III.
- Other. Please state: _____

6. For what purpose/s do you use the Peabody Picture Vocabulary Test III?
(Please tick the box or boxes that apply to you)

- To assess a child.
- To make decisions about intervention.
- As a basis for conducting further assessment.
- As a screening tool.
- I never use the PPVT-III.
- Other. Please state: _____

7. In your typical work, where would you place the PPVT-III as a priority in your testing battery? (Please mark your choice on the line below)



8. Do you find that the Peabody Picture Vocabulary Test is an appropriate test to use with Māori children? YES/NO

9. Do you adjust the Peabody Picture Vocabulary Test in any way YES/NO when using it with Māori children?

If YES, please describe the way/s in which you adjust the Peabody Picture Vocabulary Test when using it with Māori children which differ from the standardised administration procedure: _____

Thank you for taking the time to complete this survey.
Please return your completed survey using
the stamped addressed envelope provided.

6.3 Appendix C: General Information Form

GENERAL INFORMATION FORM

Testing Tamariki: "How Suitable is the PPVT-III?"



Tēnā koe,

My name is Tracy Haitana and I am a student studying towards a Masters Degree at Te Whare Wānanga o Waitaha – University of Canterbury. As part of the requirements for this degree, I am seeking volunteers to take part in a study called Testing Tamariki: "How Suitable is the PPVT-III?" The aim of this study is to research the suitability of using a non-Māori psychological test with Māori children. I am looking to recruit Māori children between the ages of 5 – 6 years, 7 – 8 years, and 9 – 10 years and their parents/caregivers who are willing to take part in this research project.

What is the project about?

In New Zealand, psychological or psychometric tests developed outside of New Zealand are commonly used by various health professionals, educationalists, and psychologists to assess Māori children. However, research shows that some of these tests may not always be best to use with Māori children. In this research project, I would like to measure the suitability of the Peabody Picture Vocabulary Test III (PPVT-III), a test widely used in New Zealand with Māori children but developed in the United States. The Peabody, or PPVT-III as it is commonly known, is used to measure word understandings and knowledge in children.

What will parents/caregivers be required to do?

As a parent/caregiver you hold valuable information and knowledge about your child's development. You will be asked to complete a short survey where you will be asked some questions about your child's growth and development. I will arrange to complete the survey with you at a time and place that suits you best. It is expected that this survey should take no more than one hour of your time.

What will my child be required to do?

If you and your child agree, I will meet with your child prior to testing in order to get to know him/her a little better and to explain the PPVT to them. I will ask your child some questions about their friends, siblings, family, school, and hobbies in order to help them feel relaxed before testing begins. I will then ask your child to complete the PPVT-III, which will require them to listen, look at pictures, and answer questions about common English words. Once testing is completed I will ask your child some extra questions about their opinion of the test which will be recorded on a cassette tape. It would be best if I could meet with your child in their own home to ensure that they feel at ease in a place that is familiar to them. It is also important to ensure that the testing environment is quiet and free from distractions to allow your child to give their best performance. Again this should not take more than one hour of you and your child's time.

What else do I need to know?

Your participation in this project is entirely voluntary, and you may choose to withdraw your participation at any time. All information collected during this study will be treated as confidential. All identifying information relating to you and your child will have your names removed and will not be used in the report or any publications. This study has been reviewed and approved by the University of Canterbury Human Ethics Committee. There are no risks identified for you or your child in taking part in this research. The final report will be completed at the end of 2006 at which time you may like to see a summary of the research results. You will also receive a short summary of your child's results along with an explanation of what the results mean.

What are the benefits in taking part?

The information that you and your child give, will help me to understand better how Māori children feel about psychological testing, and will provide some information about how suitable the PPVT-III is for use with Māori children. This information will be compiled in a Masters Thesis report which will then be submitted to the University of Canterbury. It is also hoped that this project will provide evidence which can be published in New Zealand to inform the way professionals work with Māori children.

What if I have any questions or concerns?

Please contact me or my supervisors,

Tracy Haitana
Masters Student
University of Canterbury
Psychology Department
Private Bag 4800
Christchurch
364-2987 ext.7191

Dr. Julia Rucklidge
Supervisor
University of Canterbury
Psychology Department
Private Bag 4800
Christchurch
364-2987 ext.7959

Suzanne Pitama
Co-Supervisor
University of Otago
CSMHS, C/- MIHI
PO Box 4345
Christchurch
364-3635

6.4 Appendix D: Recruitment Dialogue

Telephone Contact Testing Tamariki: "How Suitable is the PPVT-III?"



Researcher: Kia ora, my name is Tracy Haitana. I am a Māori student at the University of Canterbury. I am working on a research project called "Testing Tamariki" and I was wondering if I could speak to *(Parent's Name)* please?

PARENT LOCATED

Researcher: Kia ora *(Parent's Name)* my name is Tracy Haitana, I was given your name by *(Contact Person)*. I am a Māori student at the University of Canterbury and I would like to talk to you about my research project which is called "Testing Tamariki". Would now be a good time to speak with you?

(If yes proceed, if no, arrange an alternative time to call)

1). Great, thanks. Firstly, did you receive a copy of the Information Form describing my research?

(If yes proceed, if no, read through the Information Form)

2). Great, well I am looking to recruit Māori children aged (5 – 6; 7 – 8; or 9 – 10 years) and their parents to take part in my study. I was calling to ask whether you and your child *(Child's Name)* would be willing to participate in my research project?

(If yes proceed, if no read through Ending Call dialogue)

3). Thank you very much. I would like to arrange a time to meet with you and your child to conduct the research. When would be the most convenient time for us to meet? Where would be the most convenient place for us to meet?

GO TO ENDING CALL DIAGLOGUE

ENDING CALL FOR DECLINED PARTICIPANTS

Researcher: Thank you very much for your time.

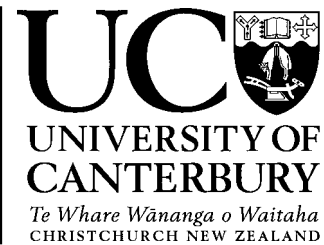
ENDING CALL FOR ACCEPTED PARTICIPANTS

Researcher: Thank you once again for your help with this study. I will look forward to meeting you and *(Child's Name)* on *(Arranged Date)* at *(Arranged Place)*. If you have any questions before then, please feel free to contact me.

6.5 Appendix E: Informed Consent Form

INFORMED CONSENT FORM

Testing Tamariki: "How Suitable is the PPVT-III?"



Tracy Haitana
Psychology Department
University of Canterbury
Private Bag 4800
Christchurch

I have read the General Information form concerning this project and understand what it is about. All my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage.

I know that: -

1. My participation in the project is entirely voluntary.
2. I have had time to consider whether to take part.
3. I am free to withdraw from the project at any time including the withdrawal of any information already provided.
4. I may decline to answer any particular question(s).
5. The information I share will be confidential and my name and the name of my child will not be attached in any way to the final report.
6. I know who to contact if I have any questions about the study.
7. I am aware that the results of this project may be published but I will not be identified and neither will my child.
8. I give consent for my child's teacher to be contacted and understand that he/she may be asked to provide information relating to my child's school performance/achievement over the past year. YES/NO
9. I would like to receive a summary of the research results. YES/NO

I _____ (full name) hereby consent to take part in this study.

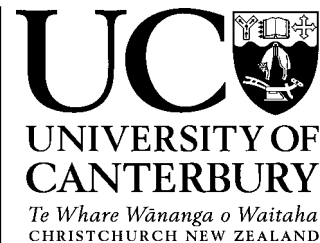
I also provide consent for _____ (child's name) to participate in this study.

Signature: _____ Date: _____

6.6 Appendix F: Developmental Survey

DEVELOPMENTAL SURVEY

Testing Tamariki: "How Suitable is the PPVT-III?"



Section 1: Demographic Information

- 1.1 Person(s) filling out this form: Mother Father Stepmother Stepfather
 Caregiver Other. Please state: _____
- 1.2 How old was this child's mother when he/she was born _____
- 1.3 When was this child born in relation to his/her siblings? (e.g. First born) _____
- 1.4 What school does this child attend? _____

Section 2: Preschool History

- 2.1 Did this child attend a pre-school? (such as an early childhood centre, kindergarten, kōhanga reo, aoga amata or similar)? YES/NO
- 2.2 If yes, at what age did this child begin pre-school? _____
- 2.3 At what ages did he/she attend? _____
- 2.4 How often did he/she attend? _____
- 2.5 What type of pre-school did this child attend? (such as an early childhood centre, kindergarten, kōhanga reo, aoga amata or similar) _____

Section 3: Pregnancy & Birth History

- 3.1 Did this child's mother have any problems during pregnancy? YES/NO
- 3.2 If yes, what kind of problems? _____
- 3.3 Were there any complications associated with the labour or delivery? YES/NO
- 3.4 If yes, what were they? _____
- 3.5 Was this child premature? YES/NO
- 3.6 If yes, by how many weeks? _____

Section 4: Infancy

- 4.1 What was this child's weight at birth? _____
- 4.2 Did this child have any feeding problems as an infant? YES/NO
- 4.3 If yes, please describe: _____
- 4.4 Did this child have any sleeping problems as an infant? YES/NO
- 4.5 If yes, please describe: _____
- 4.6 Did this child have any other problems as an infant? YES/NO
- 4.7 If yes, please describe: _____

Section 5: Developmental Milestones

- 5.1 At what age did this child first walk alone? _____
- 5.2 At what age did this child speak his/her first word? _____
- 5.3 At what age did this child become toilet trained during the day? _____
- 5.4 At what age did this child stay dry at night? _____

Section 6: Medical History

6.1 Has this child experienced any of the following childhood illnesses or conditions?

Measles	YES/NO
Mumps	YES/NO
Chicken Pox	YES/NO
Whooping Cough	YES/NO
Polio	YES/NO
Ear Infections	YES/NO
Hearing Problems	YES/NO
Seeing Problems	YES/NO

6.2 Has this child had any serious illnesses? YES/NO

6.3 If yes, please describe: _____

6.4 Has this child ever been hospitalised? YES/NO

6.5 If yes, please describe what for: _____

6.6 Has this child had any accidents? YES/NO

6.7 If yes, please describe: _____

Section 7: Additional Information

7.1 Which iwi group or groups does your child affiliate with? _____

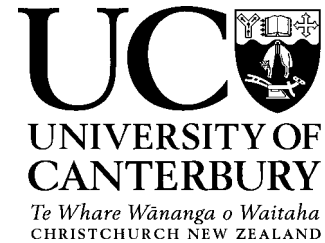
7.2 For what reason/s did you decide to take part in this research? _____

Adapted from Jerome M. Sattler (2002): Assessment of Children: Behavioural and Clinical Applications, 4th Edition, California: Jerome M. Sattler, Publisher, Inc.

6.7 Appendix G: Child Information Form

CHILD INFORMATION FORM

Testing Tamariki: "How Suitable is the PPVT-III?"



Kia ora,

My name is Tracy and I am a student at Canterbury University. I am doing a project called Testing Tamariki: "How Suitable is the PPVT-III?" I am looking for Māori children just like you to help me with my project.

What is the project about?

Every day lots of people use tests with Māori children that were not made in New Zealand. Other projects have found that these tests may not always be the best ones to use with Māori children. In my project, I want to see if one test – the Peabody Picture Vocabulary Test III (PPVT-III) is a good one to use in New Zealand. The PPVT-III is used to test how much children know about words.

What will happen during the project?

You will be asked to help with my project by listening to some questions about words and looking at pictures from the PPVT-III. When we have finished doing this, you will have the chance to look at the PPVT-III and tell me what you think about it. When we are doing this I might write some things down, and record what you say on a tape. We will do this together in a nice quiet place at your house. Even though the PPVT-III is a test, it doesn't matter if your answers are right or wrong. We want to know most of all what you think about the test, and if the test is a good one to use with other Māori children. We should be finished in about one hour.

Are there good things and bad things about the project?

There are no bad things that will happen in this project. The good things about the project are that you will be helping people to know more about the types of tests that can or shouldn't be used with Māori children. If you want to, you can also ask to know what we found out at the end of the project.

Who will know what I did in the project?

No one is going to know what you did and how well you did in the project. We keep this information safe and private for all of the children. When we do talk about the project, your name won't be written down and it will be kept private.

Can I decide if I want to be in the project?

If you do not want to be part of this project that is O.K. No one will be upset or disappointed. If you say yes now but change your mind, you can say no to one of us and that will be O.K. Your Mum/Dad/Caregiver is also reading some things about this study so that you can ask them questions if you are not sure about what you have read or heard. Please ask me any questions that you may have. I will also help you to understand.

Who can I talk to if I have questions?

Tracy Haitana
Masters Student
University of Canterbury
Psychology Department
Private Bag 4800
Christchurch
364 2987 ext.7191

Dr. Julia Rucklidge
Supervisor
University of Canterbury
Psychology Department
Private Bag 4800
Christchurch
364-2987 ext.7959

Suzanne Pitama
Co-Supervisor
University of Otago
CSMHS, C/- MIHI
PO Box 4345
Christchurch
364-3635

6.8 Appendix H: Child Assent Form

CHILD ASSENT FORM
**Testing Tamariki: "How Suitable is the
PPVT-III?"**



I was present when _____ (child's name) read/was read
the child information form and gave his/her verbal consent to take part.

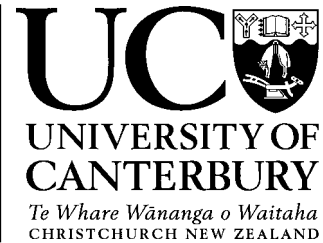
Signature of parent/caregiver: _____ Date: _____

I _____ (child's name/signature) would like to be part of this
project.

6.9 Appendix I: Test Administration Procedure

CHILD INTRODUCTION & TESTING

Testing Tamariki: "How Suitable is the PPVT-III?"



INTRODUCTION

Hi / Kia ora (*Child's Name*) my name is Tracy it's nice to meet you. I've just been talking to your (*Mum/Dad/Caregiver*) about some work that I'm doing and now I'd like to talk to you for a while, would that be okay?

PRE-TEST DISCUSSION

I've brought some fun things with me today for us to look at together. What sorts of things do you like to do most (*Child's Name*)? Do you like to play games? What sorts of games do you like to play? Well I've bought this game with me and it's called the PPVT, that's a bit of a funny name for a game isn't it! Shall we go and have a look at it together? Is there a quiet place where we can go and look together? Mum/Dad/Caregiver is going to sit here while we go and have a look at PPVT together okay? Let's go.

ESTABLISH RAPPORT

Spend at least 5 to 10 minutes talking with child and putting them at ease. Ask about their friends, their room, favourite toy, their teacher, etc. Tell them a little bit about me to establish a link.

STANDARDISED TEST ADMINISTRATION PROCEDURE

During test administration the following must also be considered:

- Are there any specific items which the child performs poorly on in a given set? (which is uncharacteristic or deviates from their overall performance)
- Are there specific items which the child performs well on in a given set? (which is uncharacteristic or deviates from their overall performance)

STANDARDISED TESTING COMPLETED – SHORT BREAK

QUALITATIVE INTERVIEW SCHEDULE

- 1). What did you like most about this game/the PPVT?
- 2). What didn't you like about this game/the PPVT?
- 3). Were there any pictures that you'd never seen before?
- 4). How did it make the test when there were pictures that you'd never seen before?
- 5). What do you think other Māori children might think about the PPVT if they were to do it?
- 6). What other comments would you like to make about the PPVT?

PRESENTATION OF POST-CEILING/INCORRECT ITEMS

(*Child's Name*) I'd like you to flick through these pictures and tell me which ones you recognise? (Child turns pages, while researcher informally states word) The word for that picture is (*present item*). Great you've finished the game!

- Are there any items that the child accurately identifies above their ceiling?
- Are there any interesting observations about the child's performance during this time?

(*Child's Name*) Now I'm going to show you some pictures that we've already looked at. (Examiner points to picture) What's this a picture of? What word would you use to describe this picture?

PRESENTATION OF KOHA

(*Child's Name*) thank you for helping me with my work. You have been such a big help that I would like to give you this special koha/treat to say thank you.

COMMUNITY FEEDBACK REPORT
Testing Tamariki: How Suitable is
the PPVT-III?



Tēnā koe,

As you may recall, you and your child *Child's Name* took part in a research project called 'Testing Tamariki: How Suitable is the PPVT-III' sometime between March and November 2006. Thanks to your help, this research project has now been completed – with 46 tamariki and their whānau taking part in total. The aim of this study was to examine the suitability of using an educational test developed in North America (called the Peabody Picture Vocabulary Test – III or PPVT-III) with Māori children.

What did we find out?

After looking at the results, we discovered that the PPVT-III was generally a suitable test to use with Māori children – however some parts of the PPVT-III were less suitable than others. For all tamariki who completed the PPVT-III, there were some words and pictures that were harder to respond to than others. These words and pictures were harder for Māori children to complete, because they tended to reflect unfamiliar American words or concepts.

It also appeared that the PPVT-III offered different information when used with Māori children from different language backgrounds. While the PPVT-III measured concepts and words in an order of difficulty that related to the overall language experiences of tamariki attending mainstream schools, for tamariki attending Kura Kaupapa and Bilingual schools the PPVT-III was only able to measure their level of exposure to the English language – and not their overall language experience.

We also determined the importance of administering the PPVT-III in a way that helped tamariki and whānau to feel comfortable. Taking time to meet and discuss the test with whānau and tamariki was important, as was encouraging tamariki at all points throughout the test. For many of the children who took part in the research, being tested at home or in a familiar environment with their whānau nearby helped them to feel more relaxed about the testing process. Asking tamariki questions about the test, and giving them time to look through the test also provided information which helped us to understand the meaning of each child's results. This type of approach to testing differs from the standard approach recommended by many psychological tests, and is commonly called 'dynamic assessment'.

What are our recommendations?

After considering all of our research findings, the following recommendations were made:

- The PPVT-III provides a suitable measure of age-based English language development when used to assess Māori children attending mainstream schools, or for whom English is their first language;
- The PPVT-III provides a suitable measure of stage-based English language development when used to assess Māori children attending either Kura Kaupapa or Bilingual units within mainstream schools, or for whom Māori is their first language;
- When administering the PPVT-III with Māori children, adjustments to the standard assessment approach could be used to improve the suitability of the test by ensuring that the examiner follows Māori processes, by helping tamariki to feel relaxed, and by helping to understand the meaning of children’s test results;
- More research is needed with Māori children before unfamiliar American items and pictures can be replaced by more culturally appropriate New Zealand items.

What can I do if I have any questions or concerns?

Please contact me or my supervisors,

Tracy Haitana
Masters Student
University of Canterbury
Psychology Department
Private Bag 4800
Christchurch
364-2987 ext.7191

Dr. Julia Rucklidge
Supervisor
University of Canterbury
Psychology Department
Private Bag 4800
Christchurch
364-2987 ext.7959

Suzanne Pitama
Co-Supervisor
University of Otago
CSMHS, C/- MIHI
PO Box 4345
Christchurch
364-3635