Phonological development in Māori speaking preschoolers: a guide to initiating child language research with Māori.

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Technical Report

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Introduction

This report outlines the background for a study to be undertaken tracking phonological development (speech skills) in Māori for Māori speaking pre-school children. Although there is a substantial body of literature on how children develop speech sounds in English we know nothing about the developmental trajectory in Māori.

This project when completed will generally contribute to research in the area of speech development by providing new information on children's development in a language that has previously not been investigated in this way. It will also give us the information to formulate questions for future Māori research in the areas of linguistics, communication disorders and bilingualism. This research will have implications for both education and health outcomes as it may provide us with information on how to tailor assessment and measure language in children with typical and atypical language development.

Another benefit of the project is that it serves an equally important purpose as a catalyst to building Māori research capability in a discipline where there are currently few Māori researchers. It is hoped that the research will act as a springboard for Māori students to choose to develop research careers in this area.

The guidelines to how to carry out this type of research are outlined in the following three sections. In the first section the background to the project is discussed. This includes a summary of the literature on the Māori language and general information on phonology and the analysis of speech sounds. Specific phonetic and phonemic features of the phonology are discussed in the context of the phonological development and considered in relation to the phonology of the Māori language. As Māori speaking children will grow up in a bilingual context this section concludes with a discussion of the literature on bilingualism and phonological development. The findings from this literature taken with the more general information on Māori phonology and phonological development are used to posit the research questions for the project. The second section of the report is given to a discussion of the methodology. In particular, we discuss the elicitation techniques and recruitment of participants. Elicitation methods are subsequently discussed with regard to the design of the picture assessment. Research conducted for this picture assessment is examined and future recommendations are made on how the assessment should be finalised. In discussing how subjects for this project will be recruited both the University of Auckland ethics guidelines (University of Auckland Guiding Human Participants Ethics Committee, 2010) and the Māori HRC guidelines (Health Research Council, 2010) have been consulted. The final section is given over to the discussion of the next stages in the project.

Background

Phonology

Phonology deals with the organisation of linguistically significant sounds. More specifically it is the study of the function of an inventory of speech sounds in a

particular language, or in language in general (Kaye, 1989; Kuiper & Allan, 2010). This can refer to the production or perception of speech sounds, and the organisation of these sounds within a linguistic system to determine the characteristics that define a particular language. The study of phonology can be likened to the study of music, or more specifically the sound produced by a musical instrument. For example, a woodwind instrument player would know how to position his fingers about his instrument; and how to coordinate the production of streams of air into the instrument in order to produce a pleasant melody. However, if we were to analyse this melody, we would note that it is really only a series of toots and whistles. It is from our understanding of how these toots and whistles are produced and organised within this piece of music that we can gather an understanding of what genre of music it is, and its theme. Furthermore, we could appreciate, though only subconsciously, that certain note changes just do not sound right to the ear; and that at certain moments there are changes in pitch, volume and timbre that make us perceive the music as sad, angry, happy or energetic. In this manner, the study of phonology can be understood as the study of how we produce and organise these "toots and whistles" within our own language to create intelligible strings of sounds that we call words and sentences (see Finch, 1998 for a more detailed analogy).

The definition of phonology has relevance to phonological development. According to Dodd et al. (2003), phonological development refers to speech development and is concerned with how humans develop from having no speech to a stage of being able to use speech in its full adult form. Traditionally speech development in children has been assessed from two distinct approaches: a phonetic one and phonemic one.

The focus of the phonetic approach is on articulatory and motor skills (Ladefoged and Johnson, 2010). In infants, the anatomical structural development of their articulatory organs is still taking place. This means an acute interest is taken in the phonetic development of an infant, to ensure that it develops the ability to correctly produce all speech sounds in its respective phonemic inventory over a given period of time. Such anatomical structural developments include skeletal enlargement of the skull; elongation of the tongue and lips; enlargement of the epiglottis; and lengthening of the vocal and ventricular folds (Baumann-Waengler, 2004). These developments assist in the evolvement of the larynx, mouth and pharyngeal areas of an infant from purely respiratory and feeding purposes to a vocal tract that is structurally and functionally ready for the production of speech sounds. In regard to this approach the emphasis in phonological development has been on tracking normative patterns of progressive speech sound acquisition. The research shows that speech sound acquisition follows a consistent pattern: in English nasal consonants such as /m/ or /n/ are noted to appear early while fricatives such as /f/ or /s/ and approximants such as /l/ or /ɾ/ came later in a child's development.

A phonemic approach refers to speech sound use, i.e., organisation of the speech sound system. This centres on the functions and behaviours of speech sounds in a particular linguistic system. The phonemic development of a child does not relate to the actual speech sound production, but rather to how these sounds are used within a particular linguistic system to correctly produce words and sentences (Kuiper &

Allan, 2010). For example, in English we perceive the letter “p” as the same in both words pin and spin. However, phonetically these two sounds are distinct. The consonant /p/ is aspirated in the word “pin”, as a puff of air can be felt in the release of the /p/ but it is unaspirated in “spin” since there is no puff of air on its release. Therefore, there is no *phonemic* distinction although there is a *phonetic* distinction between the two productions of /p/ in English. If the word “spin” were to be pronounced with an aspirated “p”, there would be no confusion in the comprehension of the word, but rather just a peculiarity in its pronunciation. For English both phonetic variants are acceptable versions of a consonant /p/. In other languages however, this may not be the same, i.e., in the Hindi language, aspirating the “p” sound in a word can alter its meaning altogether. Thus, aspirated /p/ and unaspirated /p/ are considered to be distinct and different consonants that have no relationship to each other. Given that the focus is on equating sound difference to meaning difference clinicians are particularly interested in the number and type of errors that a child makes. It is to be noted that errors are not defined as mistakes but rather as mismatches between the child’s phonemic inventory and that of the adult target (Baumann-Waengler, 2004).

Te Reo Māori

Māori arrived in the archipelago of Aotearoa by canoe approximately 1000 years ago (May, 2002). The language spoken by Māori belongs to the eastern branch of the Polynesian language family. Although there exist multiple dialects of Māori in Aotearoa, all are mutually intelligible to fluent speakers (Bauer, 1993). By the early 1800s missionaries had taken to spreading their faith to several parts of New Zealand, and taught some Māori in the most basic of literacy skills. Before the arrival of Europeans, Māori did not have a system of writing, and so Prof. Lee of Cambridge University, with the counsel of two Māori chiefs and a reverend, took to developing an early orthography for Māori. However ancient this orthography is still used today.

During the early 19th century, Māori medium schools were established to enable Māori to become literate in their own language. However, in 1867, laws were passed which prohibited the use of Māori in schools (Biggs, 1968). During the following century, children were punished for speaking Māori in school. As described by Bauer (1993), “Māori parents were exhorted to speak English to their children at home for the sake of their children’s future”. With subsequent policies pursuing the same idea, the Māori language suffered. A survey completed by the NZCER (Council for Educational Research) in 1978, estimated that there were only about 70,000 fluent speakers of Māori in New Zealand at the time, most of which were adults over the age of 45 (Bauer, 1993).

Efforts to revitalise the Māori language began in the 1970s, during a period when very few children were brought up speaking the language. Major developments for the revitalisation of Māori included: the introduction of Kōhanga Reo, bilingual units in high schools and Māori immersion in the first years of high school (Spolsky, 2010). Kōhanga Reo were established during the early 1980s as a community effort to revitalise the Māori language. It has since received government funding, and now is a thriving commendable example of language revitalisation efforts. Only 15 years on from its inception, the number of Kōhanga grew to 675, with another 30 developing

to cater to a total of 13,505 children. Additionally, 54 Kura Kaupapa Māori had since been established and three Whare Wānanga were founded. This enabled over 32,000 students to receive Māori medium education, whereby another 55,399 were able to learn the language. (Māori Language Commission: Te Taura Whiri i te Reo Māori, 2012). These statistics suggest, at least, an enthusiastic reception of Māori medium education and encourages such ventures to continue.

Māori Phonology

Most dialects of Māori contain five vowels and ten consonant sounds. Vowels include / i, e, a, o, u/; and consonants /p, m, f, w, t, n, ɾ, k, h, ŋ/. Additional to these are also the long vowels / i:, e:, a: o:, u:/ which are discussed further in this section.

Table 1: The phonemes of Māori

	Labial	Dental/alveolar	Velar	Glottal
Stops	p	t	k	
Nasals	m	n	ŋ	
Fricatives	f			h
Liquid		ɾ		
Glide	w			
	Front	Central	Back	
High	i		u	
Mid	e		o	
Low		a		

Adapted from Harlow (2007)

Biggs (1968) provides examples of these phonemes (as the words are said in NZ English)

Realisations of /i/

Pronounced short, as in *pipi,* like *i* in “pit”
Pronounced long, as in *pīpī,* like the second *i* in “intrigue”

Realisations of /e/

Pronounced short, as in *peke*, like *e* in “end”
Pronounced long, as in *pēke*, like *ei* in “heir”

Realisations of /a/

Pronounced short, as in *manu*, like *a* in “ago”
Pronounces long, as in *mānu,* like *a* in “ask”

Realisations of /o/

Pronounced short, as in *koko,* like *o* in “off”
Pronounced long, as in *kōkō,* like *o* in “pore”

Realisations of /u/

Pronounced short, as in *putu,* like *u* in “put”
Pronounced long, as in *pūtu,* like *u* in “rude”

All consonants are pronounced approximately as in English, except the following three:

Realisation of /f/
Pronounced as *wh*, as in “whale” (not wail)[1], or as *f*. Either is correct.

Realisation of /ŋ/
Pronounced ng as in “singer”, never as in “finger”

Realisation of /ɾ/
Pronounced *r*, as in the Oxford pronunciation of “very”[2]

Consonants

The pronunciation of the consonants varies widely due to such factors as dialectal variations, age differences, and varying levels of exposure to English. For example, Bauer (1993) identifies in her research that older speakers have very little aspiration, and suggests that increased aspiration is due to high contact with English. However, Biggs (1961) suggests that there is slight aspiration for all consonants, whereby the level of aspiration is predictable and increases with loudness and stress. He also suggests more aspiration occurs before front vowels than back. Another notable variation is the phonetic realisation of the /f/ phoneme, which is represented orthographically as *wh*. The most common phonetic realisation in the North Island is [f], though variations exist in the western and northern dialects (Bauer, 1993). Speakers from the Whanganui-Taranaki area consistently realise this phoneme as [ʔw], whereas speakers from the far North of the North Island realise the phoneme as [hw] or [wh][3].

Vowels

The issue of vowel length should be discussed, as it may be noted that the total number of vowels could actually have been counted to ten: five short and five long. The association between vowel length and meaning can be seen in a minimal pair test of the following words (Biggs, 1969):

anuhe	“catepillar”	[anuhɛ]
anuhē	“sickly”	[anuhɛ:]
wheke	“creak”	[fɛ:ke]
whekē	“octopus”	[fɛke]

[1] For younger speakers this would equate to a breathy sounding “w”
[2] For younger speakers this would be equivalent to the “tt” in the American pronunciation of “butter”
[3] International Phonetic Alphabet (IPA) [ʍ]

A common practice in rendering long vowels, which is endorsed by the Māori Language Commission, is to use the orthographic practice of marking long vowels with macrons, i.e., ā, ē, ī, ō, ū. This practice is most practical as the quality of the long vowel is not identical to the short vowel quality. This is most noticeable in /a/ vs. /a:/ (Bauer, 1993).

However in an alternative interpretation , Biggs (1961) has proposed that all long vowels in Māori are simply clusters of short vowels. Thus he advocated "double vowel" orthography to reflect this. This approach takes into consideration the fact that all possible pairs of non-identical short vowels occur, as well as all five pairs of identical short vowels, across morpheme boundaries, e.g., *whakaara* "raise", *haereere* "stroll about", *iriiri* "baptize", *orooro* "rub back and forth", *uruuru* "blade of a weapon". The following illustrate possible forms of pronunciation of *whakaara* and *iriiri:*

whakaara	[faka?aɾa]	[faka.aɾa]	[faka:ɾa]
iriiri	[iɾi?iɾi]	[iɾi.iɾi]	[iɾi:ri]

Pronunciation can vary according to the setting, speed, emphasis and formality of the occasion (Bauer, 1993), but the most common pronunciation of these words is the same as the realization of the long vowel (the last of the listed pronunciations). Issues arise when sequences of long and short identical vowels occur, as in *whakaāhua* "portrait". In the *āhua* "form", component of this word, the traditional macron orthography retains the etymological information, but does not represent the phonetic reality [faka:hua]. In general, when there is a clear morphological boundary, vowel sequences are used, as in *whakaaro* "decide", and macrons are used only when there are no perceived morpheme boundaries (Bauer, 1993).

Extending on the issue of long and short vowels is the frequency of diphthongs and other vowel clusters. Māori contains a greater number of vowel cluster possibilities than English with combinations numbering up to twenty for the short vowels alone (e.g., hae "lacerate", hai "hey", hao "net", hau "wind")

<u>Phonotactics</u>

In Māori, consonants are not permitted in the word-final position, nor can consonant clusters occur. Consonants may only occur in word initial position and in between vowels (Harlow, 2007) Vowels by contrast can occur in all word positions. Given the frequency of vowel clusters in Māori, it is not uncommon to find words purely constructed of vowels, i.e., *aae* "yes", *aaio* "peaceful" and *aaeaea* "panting". Thus the permitted word shapes for Māori are as follows: (CV, VCV VC, CVC, CV, CVV, CVVV, CVVVV) (Laws, 2003)

There has been extensive research done in the field of phonological development that suggests that English-speaking children only acquire particular consonant (and consonant cluster) speech sounds in the later stages of their phonological development (Dodd et al., 2003). In the Māori phonemic inventory, there are no consonantal clusters. However Māori does have vowel clusters and phonemically long vowels, both of which do not exist in English to the same degree. Given this it is

of interest to discover whether Māori speaking children will have any difficulty in producing these types of vowels and vowel clusters. The little research we have on vowels in Polynesian languages (Ballard & Farao, 2008) would suggest that clusters may not be problematic but long vowels may be difficult and require time to acquire.

Stress/Intonation

In Māori, the placement of stress is allocated within words and then phrases. Word stress must not fall more than four vowels from the end of a word. Additionally, prefixes and suffixes do not attract stress. The following are rules outlining the placement of stress within a word: a) if the word contains just one short vowel, it is unstressed; b) stress the first double vowel if there is one, e.g., máata, matáa; c) in the absence of a double vowel, stress a non-final diphthong, e.g., táuranga; and d) if neither a long vowel or non-final diphthong is present, stress the first vowel that is no more than four vowels from the end of the word, e.g., ópua, márae.

Phrase stress refers to stressing the most prominent vowel in a phrase. Phrase stress is dependent on whether the phrase is sentence-final. The following rules outline the application of stress in phrases: a) in a non-final position, the phrase stress will be on the penultimate vowel in the phrase; and b) in the final position, the phrase stress will be placed according to the rules for word-stress (Biggs, 1969).

Bilingualism

In this section, bilingualism will be discussed, and we will consider how the Māori language influences the manner in which Māori speak English. Conversely, the influence of the English language on Māori will also be discussed. Following on this an example of bilingualism in the US (English/Spanish), and its effect on phonological development in school children will be discussed and then applied to the bilingual situation of Māori speaking children.

English- Māori and Māori-English

In the late 1970s it was recorded that there were only 70,000 Māori speakers, which was estimated to be 20% of the Māori population and 3% of the total population of New Zealand (Benton, 1991). In light of these statistics, English could be said to have been the *lingua franca* of New Zealand. Due to policies pursued by early New Zealand governments (as previously described) concerning Māori in education, the Māori language has only recently taken hold in the school environment of Māori children. Māori has remained relatively strong in ceremonial and religious practices between Māori and remains the preferred language, on grounds of principle, to Māori speakers who find very few occasions to speak Māori (Benton, 1984). It was also noted by Benton (1984), that the intergenerational disparities in Māori language use were evident in the home where homes with predominantly older members spoke more Māori at a conversational level than homes with young children. For Māori speakers, a high level of biculturalism and bilingualism is necessary to live in a predominantly Pakeha society; as Metge (1976) aptly puts it, " it is Māori, who are by necessity bicultural, while most Pakeha are far from knowledgeable about any culture other than their own". It can then only be expected that English language would have had a significant effect on Māori language in some form.

Bauer (1993) identifies increased aspiration of Māori plosives as an example of English language influence. She also notes in her discussion of the fricative *wh,* that the realisation of *wh* as [f] is likely to be a post-European development. This suggestion stems from the fact that the orthographic representation *wh* does not clearly represent the phonetic realisation and rather suggests that consultants assisting Prof. Lee in devising the orthography did not have the [f] sound in their phonemic inventory. As Prof. Lee was the instigator in developing an orthographic system for the Māori language, regardless of his motives to his preference of the [f] sound, this effect can be considered an English influence. This is not to say that other dialects of Māori at the time did not have the [f] sound, but rather that because [f] has become the most widespread realisation, other dialectal variations have suffered for it (Bauer, 1993). Māori nasals are also likely to be another set of phonemes to undergo change as a result of English language influence. Biggs (1961) notes /n/ as alveo-palatal among Māori speakers, however Bauer (1993) suggests that this sound does not occur in such a retracted position. It is especially common amongst second language speakers for this nasal to be produced as a dental or pre-alveolar /n/ as a hypercorrection.

As noted by Benton (1991), much more research into the impact of English can be done in this area of linguistics for the Māori language. This is in contrast to the much larger body of research already done on the Māori language influence on English spoken in New Zealand (Holmes, 1997; Benton, 1991; May, Hill & Tiakiwai, 2004). Aptly noted by Benton (1991), it is appropriate that the distinctiveness of the Māori sub-culture within New Zealand manifests itself in the version of English that is spoken by its members (see MacLagan, King & Gillon, 2008 for an overview of Māori English). These manifestations feature in the phonology, syntax and pragmatics specific to Māori English speakers. One such feature is discussed by Hall (1976), in which “Māori pronunciations” of common terms are explained. It is suggested that in Māori English, there exists an overlap of the phonemes /i, ɪ, and e/, thus we are presented with an explanation as to why the common term “fellow” or “fella” is pronounced as “fulla”in Māori English. Another phonological variation specific to Māori English, is the devoicing of the /z/ phoneme in the word-final position (Holmes, 1996). It was found from a sample of 97 adults that those who were Māori produced the voiceless variant of /z/ more often than their Pakeha counterparts. It was suggested that this variation acted as a marker of Māori ethnic identity, especially amongst Māori women. The common use of this variant among older speakers of Māori suggests a possible origin of this feature. A pragmatic feature of Māori conversation also discussed was the use of silence and pauses in Māori dialogue, especially during informal monologic text-types. It was found that Māori listeners produced about a third less verbal feedback when listening to a narrative than their Pakeha counterparts (Stubbe & Holmes, 2000). Although initially attributed to Māori being silent listeners, a further analysis of the situation reveals that in Māori narration, the narrator relies on inexplicit assumptions on the part of the listener in order for the listener to effectively comprehend the narration. To the Pakeha listener, this type of narration is unfamiliar, and considered “airy-fairy”. For this reason the need to interrupt the speaker arises, whereby the Pakeha listener regularly question the narrator for additional information to help him better

comprehend the narrative. Māori listeners understand however that in order to fully comprehend the narrative, one must listen to it as a whole in order to piece it together. Stubbe & Holmes (2000) refer to this practice as a sign of politeness, exhibiting the listener's attentiveness.

Phonological development in bilingual children

Research conducted by Fabiano-Smith & Goldstein (2010) on bilingualism in the United States discusses the impact of bilingualism on the phonological development of bilingual Hispanic children. Of particular interest are the disparities that occur between the ages of acquisition of certain phonemes for bilingual children, compared to those of monolingual children. In their research, it was found that monolingual English speaking children successfully produced a higher percentage of all consonant classes than the other two classes of speaker (Spanish monolingual and bilingual). The bilingual children were however noted to be quicker than their monolingual counterparts in either language (English, Spanish) in acquiring affricates and glides. This analysis then suggests that bilingualism has both a decelerating and accelerating effect on a child's overall acquisition of phoneme items. While the accelerating effect is not discussed further it is noted that decelerating effects may be due to the fact that bilingual children possess quite an ambiguous speech sound perception, whereby they categorise two phonetically similar sounds from each of the two languages, into one sound (a notion first introduced by Flege, 1981). The resulting sound would only accurately represent one of the two languages. Māori speakers are, for the most part, bilingual by necessity, so with these factors in mind, it may be reasonable to assume that this hypothesis of deceleration will hold true for bilingual Māori speaking children.

In the research conducted by Fabiano-Smith & Goldstein (2010), the two languages in question shared a total of 15 consonant sounds spread over five consonant classes; nine unshared sounds specific to English, spread over four consonant classes and five unshared sounds specific to Spanish, spread over four consonant classes. Of the unshared sounds specific to Spanish, the "flap" and "trill" classes were not employed in the English language, and so were not tested for English monolingual children. Māori shares only ten consonant sounds with English, of which only one is exclusive to Māori, /ɾ/. By contrast, there exist 14 sounds exclusive to English. Considering the ambiguous sound perception hypothesis (Flege, 1981; Fabiano-Smith & Goldstein, 2010) it would be reasonable to suggest that any variations of speech sound production in Māori can be attributed to this perceived ambiguity.

Current research into phonological development for bilingual children has shown that bilingual children develop differently to their monolingual counterparts. Therefore, when bilingual students encounter issues with their speech sound acquisition steps can be taken to identify the problem areas and appropriate measures can be taken. Most of this research is focussed on typologically related languages such as Spanish and English. To date there has been no research conducted to track the normal phonological development of Māori speaking children. Therefore, when Māori speaking children acquire speech sounds, it will not be known if they are progressing normally, or if they have speech difficulties. In the fore mentioned research by Fabiano-Smith & Goldstein (2010), it was identified that

the probability of bilingual children encountering problems with their speech sound production in either language is somewhat higher than if they were simply monolingual, so it is likely that they will require assistance. This emphasises the importance of the need for research in this area for Māori language speakers.

Questions for the proposed research

The review of the literature has shown that to date there has not been any research into Māori phonological development. We have discussed the differences between Māori and English in regard to phonology and we have considered the language context for the majority of Māori speakers and considered the impact that their bilingualism has on phonological development. Given the research, the following questions may be posed:

1. Is Māori phonological development going to follow the same trajectory as that of English? If not, where would the differences occur?
2. Does second language learning affect Māori speaking children's phonological development? If yes, what impact does it have?

Of secondary importance:

3. What influence does dialectal variation have on the phonological development of Māori speaking children?
4. Does the fluency, dialect or proficiency of the kaiako/kaiawhina have a significant impact on the children's phonological development?

Methodology

Picture assessment

In past research into phonological development (Dodd et al., 2003; Fabiano-Smith & Goldstein, 2010) the preferred method of elicitation has been through picture assessment. This assessment typically comprises of a plain piece of card with the picture of a particular object, action, person, animal etc. The assessment generally adhers to the following structure: the child is shown a card, the appropriate elicitation methods are taken to acquire the desired speech sound production from the child; the production of the desired speech sound is recorded (either in audio or audio/video); and later the speech sound is transcribed in IPA (International Phonetic Alphabet) and analysed. A major task of this project was to develop an assessment appropriate both linguistically and culturally to the subjects; Māori speaking children. The following considerations were made:

- Comprehensible to young children

This consideration takes into account the limited vocabulary of young children, and so items such as food processor, airbags, alarm systems and picture frame are not suitable. Vocabulary sought would be words that Māori speaking children are familiar with, and could reasonably be expected to know the name of.

- Appropriateness for young children

This consideration takes into account the sensitivity and innocent nature of young children. As such no items overly purporting inappropriate ideas are used, i.e.,

images that are death or sex related, images over-representing certain ideologies or faiths etc.

- Imageability of item

This consideration concerns the ability to transform the item into an image that will be well received by Māori speaking children. The following are considerations to be taken: the effective use of colour, use of simplistic images that are not too detailed and "noisy" and effective portrayal of the item in question. The last consideration is particularly important as we found that intangible ideas, actions or adjectives were common items that were difficult to create an image of. An image of a verb such as "to sit" requires several elements in order for it to effectively portray what it means. In that regard it is worth asking whether real images are more effective than graphically produced ones. A cartoon image of a potato is for instance not as recognisable as an actual photo of the same vegetable.

- Loan words & transliterations

This consideration concerns the varied attitudes taken towards loan words and transliterations. It has been our observation that some speakers do not approve of some loan words and transliterations that have been adopted as the standard forms. Care must then be taken in preparing a word list to ensure that all words fairly represent what the community would like their children to learn, i.e., should we replace the transliterated days of the week Mane, Tūrei etc. with Rāhina and Rātū?

- Coverage of target phonemes

This consideration concerns the coverage of the phonemes that are looking to be assessed in the research. Ideally, the word list would cover all possible phonemes within the Māori phonemic inventory. This would ensure that a complete analysis can be made of the phonological ability of Māori speaking children and provide for more reliable data for ongoing research (Cooke, 2007)

- Word size

This consideration refers to the finding that young children have difficulty producing particularly long words in English (James, 2001). In the Māori language however, there are many words that can become quite long and other research (Ballard & Farao, 2008) suggests that long words may not necessarily be an issue for some languages. Therefore, items in the word list should include words that vary in length, from relatively short, to relatively long, e.g., pūngāwerewere "spider".

Various resources were consulted in the development of these considerations. These included learning resources Tukuna Kia Rere, Hopungia; Kōrero kia mohi (passed on to us informally through our research associate Waimirirangi Andrews) and Kawea te rongo (Berryman et al.,2001) All resources were assessed for suitability and a sample picture was prepared to show to kōhanga reo that are likely to participate in the future (see Appendix One). A final word list has not been prepared in recognition of the fact that any assessment needs to be designed in consultation with participating kōhanga.

Elicitation procedure

Ballard & Farao (2008) describe an effective means to eliciting words from children. Before the actual assessment time, the researcher conducting the field work (assessment exercise in this instance) should familiarise themselves with the children. This means that it may be necessary that the researcher attend several classes with the children before the actual assessment to ensure his/her presence is welcome. Once the researcher has familiarised him/herself with the children, the assessment may commence. Each word should be assessed only one time, whereby the children will be asked, He aha tēnei? "What is this?" If the child does not produce the desired word on the first instance, the researcher should elicit the word from the child by prompting, e.g., (elicitation of the word house) "It's big and people live in them". If the child still does not produce the desired word, the researcher should give the child a forced alternative, e.g., "Is this a barn or a house?" If the child still does not produce the desired word, the researcher should encourage the child to imitate the word, e.g., "This is a house, can you say house for me?" There should be no huge cause for concern if a child is not able to spontaneously produce a few or all desired words as Fabiano-Smith & Goldstein (2010) note that only minor discrepancies can be observed between spontaneous and imitated forms.

A further issue to consider, as noted by Benton (1991) is the issue of judgement. Nowhere in the elicitation process should the researcher show to be passing judgement, or show displeasure toward the children or any of the kaiako or kaiawhina in any way. In an environment where non-standard is regularly considered sub-standard, there is need for care to be taken on such matters.

Recruitment

A major concern in recruitment is sourcing a suitable sample group that is willing to participate. In this particular project, a kōhanga reo is the preferred centre to obtain a sample group from. This is largely due to the language immersion nature of the kōhanga reo environment and to the range of ages available within the under five category. When conducting relations with such an organisation however, the research team must observe certain ethical considerations. Such considerations are presented in the document "Guiding Principles for Conducting Research with Human Participants" (University of Auckland Human Participants Ethics Committee, 2010). Outlined in these principles are the usual privacy, written consent and conflict of interest clauses. However, more specifically related to this project is the issue of social and cultural sensitivity. Besides the given expectations of treating people with respect and being considerate of the participants' social and cultural frameworks, researchers are expected to use appropriate channels to acquire permission to work with groups relevant to the researchers' project. This means consulting whānau, hapū and/or iwi on issues relating to Māori cultural and ethical values. It is also outlined that if there are clear potential implications of the research of direct interest to Māori, the researcher must show that appropriate consultation has taken place. The HRC Guidelines (Health Research Council of New Zealand, 2010) also take a similar position, emphasising the importance of consultation as a means to developing research partnerships, identifying the most useful of research design methods and resolving contentious issues. Consultation assists in breaking down issues of mistrust between participants and researchers and supports an

environment of cohesive research partnerships that will accommodate to current and future projects.

The current status of this project is at the consultation process. As described in the previous paragraph, consultation can be lengthy, but it is a very necessary process. The initial consultation phase began with the lead researcher with the aid of a research associate approaching a prospective kōhanga. This initial contact lead onto an introduction of ourselves as researchers and the kaupapa of the research to the tumuaki of the kōhanga in question, Te Kōhanga reo o Te Raki Paewhenua (see the letter of introduction in Appendix Two). This correspondence occurred through this particular associate, who acted as a liaison for this project. It was communicated that the tumuaki would speak with the kaumatua of the institution. This kōrero later resulted in an invitation to join in the following kōhanga whānau hui. This invitation was accepted by the lead researcher, who presented herself, and the kaupapa to the whānau hui. After some discussion at the hui, it was decided, with the approval of the kaumatua, that further deliberations would be heard at a more general meeting of several kōhanga and a written description of the project be sent directly to the Kōhanga Trust. A copy of this can be found in the Appendix Three. The head of the trust responded positively to the project but will not be moving immediately to invite the researchers to the wider hui. At present the trust is involved in Treaty of Waitangi applications and will not be considering projects until the settlement has been resolved. At this stage the researchers will wait until the trust are ready to proceed. Further consultation is expected by the research team, where it is hoped that this consultation process will provide for a more cooperative research partnership to between the research team and the Māori organisations.

Next stage of the research

At this current point in time the researchers have undertaken a literature review and prepared a sample of the picture assessment materials. As noted in the preceding section they are awaiting the opportunity to present the research plan to the wider Kōhanga Trust. The consultation at this level is envisioned as a lengthy process but an important one to gain approval for the project and access to individual kōhanga.

Once approval for the project has been given the researchers intend to begin consultation with whānau from the individual kōhanga in regard to assessment materials, procedures and data collection. Ethics from the university will be sought for the recruitment of participants and additional Māori speaking research assistants will be employed to collect data or will be taken on as post graduate students to undertake this research as a Masters project.

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Appendix One: Sample Picture for Assessment

Manu

Appendix Two: Letter of Introduction to Kōhanga

Tēnā Koutou e te whānau,

Ngā mihi nui ki ngā rangatira, ngā mātua/whaea, ngā kaiako/kaitautoko o ngā taonga Māori, ara ngā tamariki. Nō reira, I waihotia tēnei kōrero iti noa iho i te tautoko tēnei mahi tiaki i ngā taonga. Ko te pātai nunui kia whaiwhakaro e pa ana ki tēnei tono. i te whakapuāwai te tikanga ororeo .

We greet you as the respected elders, parents, and supporters of our tamariki and we humbly ask if you would consider our application to develop a study on phonological development of those tamariki attending your Kōhanga Reo.

Nō reira, to provide you with introduction on the nature of tēnei mahi rangahau, the following information is provided. In this way it is hoped that you may be able to pass it onto whānau of Te Kōhanga Reo as an introduction of who we are, and the aims/objectives of this study. Further, we hope this will be seen as a means to indicate our determination to ensure our actions and this research meet with Kaupapa Māori standards. Importantly, we hope with this information whānau can meet with us early in the New Year (2012).

The following is a kōrero by Elaine Ballard (a lecturer in the Department of Psychology of the University of Auckland whose interests are phonology, child language, multilingualism, historical linguistics and languages other than English). In her most recent research her focus is on phonological development in languages as diverse as Mandarin and Māori.

<u>Tīmatanga Kōrero</u>
Senior Researcher: Elaine Ballard
Project Location: Tamaki campus of The University of Auckland and data collection by the intern(s) will be carried out in selected kōhanga reo.

Project purpose: The project is a pilot for a larger project tracking phonological development (speech skills) in Māori for Te Reo speaking pre-school children. Although there is a substantial body of literature on how children develop speech sounds in English we know nothing about the developmental trajectory in Māori.

This pilot study will give us the information to formulate questions for future Māori research in the areas of linguistics, communication disorders and bilingualism. This research will have implications for both education and health outcomes as it may provide us with information on how to tailor assessment and measure language in children with typical and atypical language development.

One purpose of the project then is to contribute to knowledge about language acquisition in Māori children. The project however serves a second equally important purpose; this is to build up Māori research capability in a discipline where there are currently few Māori researchers. It is the Senior Researcher's hope that the pilot will also serve as a springboard for Māori students to choose to develop research careers in this area.

<u>Kaupapa Māori Research Responsibilities</u>
1. Researchers will work within a Kaupapa Māori Framework and follow tikanga and kawa during all stages of the study.
2. Researchers will consult with whānau during the development process of the design of the study.

3. Researchers will consult with whānau on the outcome of all results.
4. Interactions with whānau, participants, and key informants will be confidential and they will not be identified in any report unless they give their permission for this to occur.

Programme of work to be carried out

This project has the potential to provide more reliable and valid findings as intern(s) will be required to work together with the Senior Researcher on the following tasks:

1. Designing a picture-naming task based on the consonants and vowels of Te Reo.
2. Building and strengthening relationships with whānau of a Kōhanga Reo, for the recruitment of participants for the study.
3. Collecting data at a Kōhanga Reo. This involves building rapport with whānau and participants, and recording participants' responses to the picture-naming task.
4. Transcribing the children's utterances
5. Organising data into an excel spreadsheet
6. Working together with the Senior Researcher on an initial analysis.
7. Writing up of initial results.

Day to day nature of the work: Given the programme outlined above intern(s) are expected to spend the first three weeks of the internship at Tamaki Campus working on the picture naming task, learning transcription and data collection techniques with the Senior Researcher and familiarising themselves with the literature on language acquisition. The next three weeks will be spent at Te Kōhanga Reo. Here intern(s) will meet staff and parents to discuss the project. They will be responsible for recruiting participants to the project. They will be expected then to spend time establishing rapport with children who have been recruited before assessing and recording. The remaining four weeks of the internship will be spent listening to the recordings, transcribing the children's utterances and entering the data into a spreadsheet.

Under the Senior Researcher's guidance, the intern(s) will make an initial analysis and write up their findings.

Skills the intern(s) will learn

1. How to structure a language assessment.
2. Linguistic foundation to how to analyse Māori phonology.
3. Transcription skills
4. Data collection techniques specific to language projects (elicitation techniques, recording).
5. Interpretation of data.
6. How to structure their findings for publication purposes.

Nga mihi nui ki a koutou katoa

Nā mātou

Elaine Ballard
Joshua Tahana
Waimirirangi Andrews

Appendix Three: Project Description Provided to the Kōhanga Trust
Project: The phonological acquisition of Te Reo speaking preschoolers

Description

The purpose of this project is to track phonological development (speech skills) in Te Reo speaking pre-school children. Children are not born with a fully functional adult speech sound repertoire and speech sounds are acquired gradually over the course of the child's early years. It is to be noted that much of the mastery of sounds takes place in the preschool years but is not complete until after school entry. Speech development of English is well documented in research however we know next to nothing about speech development (let alone language development) in Te Reo. In the proposed research we are interested in discovering:

- the order in which the consonants of Te Reo are acquired and mastered
- the order in which the vowels of Te Reo are acquired and mastered
- how quickly children are able to say longer words (longer than two syllables)

Rationale

Research on Māori language development (e.g., Berryman et al., 2001; Rau, 2003; May and Hill, 2005) and measures (Aromatawai Reo Mata, Kawea te Rongo) have been undertaken but this work has been focused on language and literacy development at the primary school level. Research needs to be undertaken at an earlier level as the development of a child's language skills (including speech) is a precursor to literacy acquisition and the development of academic skills for later success in school. Having a clear understanding of how a child goes from babbling to being able to speak all of the speech sounds, using words and grammatical structures of their language gives us a benchmark by which we can assess whether a child is developing typically or may have issues in language development. Tracking language at the preschool level is important because it allows us to provide children and their whānau with appropriate support for Te Reo language development as early as possible. Furthermore research at the preschool level can then be used to inform research already undertaken and/or in progress on language development at the primary school children.

Whānau involvement

Research into the development of Kawea te Rongo indicates clearly that any assessments and resources developed for Te Reo must contain settings, people and situations that children can relate to culturally. Therefore the proposed research needs to be consultative and aimed at the collective rather than at the individual. Consultation between family, teachers and researchers is necessary at every step of the research from the development of a speech assessment tool through to data collection and later dissemination of findings. As a way to ensure that consultation takes place the researchers will establish with whānau a group who are happy to monitor the research. Whānau involvement is critical as the knowledge they bring to the research process through their day to day interactions with their children will greatly improve the research design.

Benefits of the research

Although the proposed project is specifically focused on speech sounds the researchers see this as the beginning of a long-term collaboration between academia, Te Kōhanga Reo and whānau. The whānau may not see the benefits immediately but the production of culturally informed language measures that can be used to assess preschoolers in Te Reo will have implications for better education and health outcomes.

The research also serves a second equally important purpose; this is to build up Māori research capability in a discipline where there are currently few Māori researchers. The findings from the proposed study will give the researchers the information to formulate questions for future Māori research in the areas of linguistics, communication disorders and bilingualism. It is the Senior Researcher's hope that this will serve as a springboard for Māori graduates (Masters, PhD and postdoc.) to choose to develop research careers in this area.

Finally, the instigation of this project is proposed to have a beneficial impact, in some small but valuable way, to meeting Articles II and IV of Te Tiriti O Waitangi. Our understanding of these two Articles is that under Article II Te Reo, as a taonga, must be protected, and that under Article IV we are aware that this research must be carried out with adherence to Māori custom.