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EDITORIAL POLICY

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TABLES AND FIGURES

Copies of tables and figures should be attached at the end of each copy of the manuscript. Use Arabic numerals for both tables and figures. Please attempt to simplify complex tables by making two or more separate tables. Table titles and figure captions should be short but clear.

ACKNOWLEDGMENT(S)

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EDITORIAL

I am pleased to present the 65th volume of the New Zealand Journal of Speech-Language Therapy. The four articles comprising this issue provide excellent examples of the range and depth of communication disorders research occurring in New Zealand. The first article by Ballard and Farao focuses on the creation of a tool for the assessment of Samoan-English bilingual children who reside in New Zealand. Samoans form the largest Pacific ethnic group residing in New Zealand, so it is quite likely some of these children will be part of a speech-language therapist’s caseload at some point. The paper describes those features of Samoan phonology that may influence spoken English and serves as a guideline for therapists in the determination of a phonological disorder. The paper by McCann and her colleagues is an ambitious piece of research that involved examining a group of language impaired children in the sole Language Unit (LU) in New Zealand and comparing the language behaviour of these children to those in a mainstream setting. The researchers note that, regardless of the intervention setting, children with language disorders present with a range of difficulties. As such, the focus of intervention should be placed on the uniqueness of the child rather than the intervention setting.

The article by Hope and Maclagan has both a sociolinguistic and communication disorders focus. The researchers performed a detailed phonemic analysis of a wide selection of New Zealand children’s books. On the basis of this analysis, they determined the frequency of occurrence of consonant and vowel phonemes for New Zealand English (NZE). The data provide a portrait of the differences in phoneme occurrence across New Zealand, British, and American varieties of English. In addition, the data are serving as part of a larger project to develop a NZE version of the Hearing in Noise Test (HINT). The final article in this issue is by O'Connor and McCann, who performed a fascinating pilot study on the topic of conversation-based intervention. The researchers recruited and trained a General Practitioner in the techniques of Supporting Conversation for Adults with aphasia (SCA). The results were encouraging and suggest that training of this nature could be of high value in the education of physicians and in their eventual effectiveness as practitioners with such patients.

I have enjoyed overseeing the publication of these papers and believe each makes a unique contribution to our “growing research culture” in New Zealand. As you read these papers, my hope is that you will consider submitting your own research to the Journal. Submissions from practising clinicians are especially encouraged. Our goal is to increase the international visibility of the Journal so that the research taking place in New Zealand is disseminated more widely. Your contributions to the Journal help to showcase the quality of research occurring within the country. On a final note, I would like to acknowledge Phoebe Macrae, who is the associate editor of the Journal. The current issue of the Journal would not have been possible without her excellent managerial skills.

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Designing a Phonological Assessment for Samoan-Speaking Children: Linguistic/Cultural Considerations and Initial Findings

Elaine Ballard, PhD¹
Sharon Farao, MSLTPrac²

¹Speech Science, University of Auckland, New Zealand
²Counties Manukau District Health Board, Otahuhu, Auckland, New Zealand

This paper reports on the development of a phonological assessment tool used with Samoan-speaking children growing up in New Zealand. In designing such an assessment we discuss both linguistic and cultural issues pertaining to the creation and piloting of the assessment. These include the need for an alternative method to score code switching between the two stylistic registers of Samoan and the acceptance of transference patterns into the variety of Samoan spoken. Initial findings from the pilot undertaken with four-year-old children are also discussed. A focus is given to the type of phonological error patterns produced by children in this age range.

New Zealand is no longer a monolingual society and is becoming increasingly multicultural and multilingual. Between 1996 and 2006 the number of people who speak a language other than English has increased by 43.3% from 468,711 to 671,658 (Statistics New Zealand, 2007). Due to these demographic changes it is likely that speech-language therapists will encounter bilingual children with articulatory/phonological disorders in their clinical practice.

Assessing bilingual children for a suspected speech difficulty is a challenge. The clinician should ideally assess the child in both languages spoken if an appropriate assessment is to be made. While there are tests for assessing articulation and/or phonological abilities in English, such as the Diagnostic Evaluation of Articulation and Phonology (hereafter, “DEAP”) (Dodd, Zhu Hua, Crosbie, Holm & Ozanne, 2002), there are very few assessment materials for languages other than English. As a consequence, therapists are reduced to using informal assessment procedures with bilingual clients or English-only assessments. Informal assessment can be used but the clinician needs to be sufficiently familiar with the language and culture of the bilingual client for this to yield valuable information. English language results can also provide some information on a client’s phonological skills but should be treated with caution. The normative samples from these assessments are derived from monolingual populations and are meaningless when used with bilingual populations, as the rate and route of phonological development in bilingual individuals move along a different trajectory to that found for monolingual speakers (Zhu Hua & Dodd, 2006).

Phonological assessment tools which target children who speak languages other than English do exist (Mandarin, Zhu Hua & Dodd, 2000; Spanish, Mattes, 1995). However, to our knowledge such assessments (whether monolingual or bilingual) are not available for any of the Polynesian languages. In the following paper we present an assessment tool that has been used to collect normative data for Samoan-speaking children raised within the bilingual context of New Zealand. This tool has been developed specifically for bilingual speakers and is being standardised on typically developing preschool children. Although our experience comes from assessing children in a research setting, we believe the tool can also be used in a clinical setting by therapists assessing Samoan-speaking clients in their practice.
In addition to the assessment, we discuss a number of issues that are relevant to its content and scoring. These include background information on the target population, the phonology of Samoan and the particular variety of Samoan spoken within that population. The details for these issues are specific to bilingual Samoan communities and will provide clinicians with the necessary background for working with Samoan families. There is little information on the developmental norms for Samoan and these are restricted to a monolingual context (Hovdhaugen & Simonsen, 1987; Kernan, 1974; Ochs, 1985). We therefore provide therapists with a brief description of the phonological skills and the likely error patterns for the preschool speakers of Samoan we have assessed using this tool. A more detailed discussion of our findings can be found in Ballard and Farao (2008).

Background to the Assessment

Our aim in designing this assessment was to develop a tool that could be used with Samoan-speaking children. In doing so, three issues (population characteristics, language of the community and the phonology) were found to impact on the design and assessment procedures.

Target Population: Culture and Characteristics

Samoan is a Polynesian language spoken by an estimated population of 466,000 (Samoa, 2009). It is spoken on the Samoan archipelago, which is located 2,200 miles southwest of Hawaii, and also in overseas immigrant communities in New Zealand, Australia and the United States. The majority of ethnic Samoans reside outside of the Samoan islands. A sizeable population of 131,100 resides in New Zealand (Statistics New Zealand, 2007). Samoans form the largest Pacific ethnic group in New Zealand and comprise 49% of the Pacific population. Since the 1950s, Samoans have been immigrating to New Zealand for better employment and educational prospects and 60% (77,247) of their total population are born in New Zealand. Their communities are concentrated in the Auckland area with 67% (87,003) residing in this region.

The Samoan population in New Zealand (hereafter, “the Samoan population”) is a growing one and has increased by 14% between the census of 2001 and 2006. A large proportion of this population is youthful, with approximately 38% aged 15-years or younger (Statistics New Zealand, 2007). Given the size of this population speech-language professionals often encounter children from Samoan backgrounds, as many of them have difficulties as a consequence of middle ear disease. The prevalence of otitis media is noted to be high for Pacific children (National Audiology Centre, 2006). A positive history of this disease with concomitant hearing loss may have consequences for speech and language development (Miccio, Gallagher, Grossman, Yont & Vernon-Feagans, 2001).

The Samoan way of life (fa’a Samoa) is centred on family and church. Their understanding of family is centred on the extended family. Children often grow up in homes with several generations of family members and are looked after by members of the family other than their parents. The family unit is hierarchical in nature and rank is afforded by age and gender. Children are therefore expected to comply with their parents’ wishes, respect elders and not interrupt adult conversations. Values such as individualism, independence and equal rights, which are so highly regarded in western society, are in direct contrast to the values of interdependence, collectivism and differentiated rights which are equally highly regarded in Samoan culture.

Religion is an important focal point in the Samoan community with 84.7% of the population identifying themselves as Christians (Statistics New Zealand, 2007). As noted in Duranti, Ochs and Ta’ase (1995), Samoan immigrants form local communities based around the church. The church is seen as an axis for preserving language, identity and traditions as it provides a context where knowledge of Samoan is encouraged and promoted. Sunday services are, for the greater part, still conducted in Samoan and children participate in Sunday school activities where they are exposed to Samoan through learning the alphabet, reciting and memorising bible passages.

Language Variety

Information from the 2006 Census (Statistics New Zealand, 2007) indicates that Samoan is the third most widely spoken language in New Zealand after English and Māori. As such, there is still a high percentage of Samoan spoken in
homes (approximately 63%). A higher proportion of those born overseas (90%) than those born in New Zealand (44%) are able to speak the language. Immigrants of Samoan ethnicity are generally assumed to be bilingual as both English and Samoan are spoken in Samoa. Bilingualism however does not denote fluency as many students originally from Samoa do not perform well academically and/or are considered to be second language learners of English. Little is known about the levels of bilingualism in the New Zealand born Samoan community, as there are no figures in the latest census relating directly to level of Samoan spoken and the degree of proficiency in English. What is known is that a proportion of children under the age of 10 are bilingual, as census figures show that the level of Samoan language use has increased for this age group. This is not surprising given the efforts of the Samoan community to maintain their home language through the high level of participation in church activities and the establishment of Samoan language early childhood education centres (ā'oga 'āmata). The centres provide a setting where children develop language and literacy skills in Samoan and engage actively with the culture.

From our experience in assessing Samoan-speaking children we note that they display a wide range of proficiency in the Samoan language. They range from those who are essentially monolingual in Samoan to those who speak limited Samoan and are more comfortable in English. There is also variation in regard to the type of language young children are exposed to within the home. While young children in more traditional families may be exposed exclusively to Samoan within the home and have limited exposure to English through the medium of television and popular culture, there will be others (particularly 2nd & 3rd generation) who encounter a mix of Samoan and English within the home. The child’s choice of language then depends on whom s/he interacts with within the extended family. Young children may use Samoan exclusively with the elderly, they may code switch between Samoan and English with family members who are themselves bilingual, and they may use a variety of English with older siblings who already attend school.

Although there are no discernible regional differences or dialects in Samoan there are two clearly distinguishable registers. The literary/formal (tautala lelei ‘good language’) register is spoken on formal occasions, in ceremonies and from the pulpit. It is the register used in speaking to non-Samoans and is the variant appropriate for public broadcasts, news, educational settings and a learning context. This variant has a written and spoken form. On other occasions Samoans use the colloquial variant (tautala leaga ‘bad language’), an exclusively spoken variant. This variant is used by Samoans within the home and in daily interactions (Mosel & Hovdaug, 1992).

Children growing up on the islands are exposed to the formal variant through school, media and Christianity but the first two of these contexts are not available to Samoan children in New Zealand. Children of Samoan ethnicity are therefore more likely to be exposed to the colloquial register because interactions within the home and the Samoan community are predominantly conducted in the colloquial register. Opportunities for hearing and using the formal variant are more limited but do exist. Children may be exposed to the literary register through Samoan church activities such as praying and reciting from the Bible. They may also hear this register in the homes as proficient adult speakers of Samoan code switch freely between the two registers. This depends on who they are speaking to (Samoan or foreigner) or on the type of activity they are engaging in (saying grace at dinner, having a conversation with another Samoan adult). The differences between the two registers are particularly salient in the phonology of Samoan, and also marked in certain morpho-syntactic differences such as tense/aspect marking (Ochs, 1985).

Phonology of Samoan

The differences between the two registers are evident in the consonant inventory. The formal literary register has 13 consonants /p, t, k, ʔ, m, n, ŋ, v, f, s, h, l, r/ (Mosel & Hovdaug, 1992). Of these consonants /h, r, k/ are found mainly in loanwords, e.g., /kirisimasi/ ‘Christmas’ /hoki/ ‘hockey’ /rosa/ ‘rose’ and do not occur with the same frequency as the other consonants. The consonant /h/ is also found with interjections such
as /hai/ (indicating yawning) and /he/ (indicating laughter).

The colloquial register has 10 consonants /p, k, ʔ, m, ŋ, v, f, s, h, l/. The phonemes which are absent from this register are /t, n, r/. Lexical items that have a /t/ in the formal register have a /k/ in the colloquial register, items with /n/ have an /ŋ/ and items with /r/ have an /l/. As a consequence, many lexical items that form minimal pairs in the formal register are homophones in the colloquial register. Lexical items /tiː/ ‘tea’ and /kiː/ ‘key’ are both realised as [kiː], /ana/ ‘cave’ and /aŋa/ ‘conduct’ as [aŋa] and /koko/ ‘cocoa’ and /toto/ ‘blood’ as [koko].

All of these consonants, regardless of the stylistic register, will be familiar to speakers of English since these consonants, with the exception of the glottal stop, occur as phonemes within the English inventory. There are subtle differences in articulation for some of the consonants. As these have been discussed in detail in Ballard and Farao (2008), we only mention here the differences that may impact on the children’s articulation of English.

As Mosel and Hovdhaugen (1992) indicate, the plosives /p, t, k/ of Samoan do not have the same degree of aspiration as that found in English. Labial and velar plosives are unaspirated or sometimes weakly aspirated, while /t/ tends to be aspirated more consistently. As a result of the differences in aspiration, speakers of English often perceptually associate the /p, k/ of Samoan with the /b, g/ of English and Samoan speakers may not distinguish between /p, b/ and /k, g/ in English.

The fricative /f/ is articulated in a manner similar to that found in English but can also be articulated as a bilabial [ɸ] or [h] (Mosel & Hovdhaugen, 1992). Adult speakers have been noted to occasionally confuse /p/ and /f/ by pronouncing /p/ as [f] or /f/ as [p]. Samoan /s/ is similar to its English counterpart, although it is described as being less sibilant than English /s/ (Churchward, 1951). This fricative can also be articulated as an affricate [ts] in the environment of a stressed vowel.

Samoan has two voiced liquids, a lateral /l/ and a non lateral /r/. While Samoan /r/ is articulated as a trill, /l/ tends to vary widely in its articulation and has a range of allophones which include [r], [l], [3] or [ɾ]. Of the four allophones [ɾ], [l] or [ɾ] are more likely to be associated perceptually with /r/ than /l/ by the English speaker, as these do not have a lateral articulation.

The Samoan phonemic vowel inventory consists of ten vowels and five monophthongs /i,e,a,o,u/, further distinguished phonemically by length /iː;eː,aː,oː,uː/ (Mosel & Hovdhaugen, 1992). Long duration vowels are indicated orthographically with a macaron, e.g. vāiaso ‘week’ and minimal pairs are common, e.g., /tama/ ‘boy’ and /tamaː/ ‘father’. Generally speaking, Samoan vowels are similar to vowels that occur within the English inventory. There are of course some articulatory differences. Samoan /i/ is similar to the New Zealand English (NZE) equivalent but is articulated with the tongue higher and more fronted. When this vowel is unstressed and occurs before another vowel in word initial position it tends to become a glide; for example, /iato/ ‘outrigger’ is pronounced as [jato]. The same glide formation is found for the high vowel /u/; for example, /uati/ ‘watch’ is articulated as [wati]. The remaining vowels consist of the mid-vowels /e/ and /o/ and one low vowel /a/. The mid-high vowel /e/ is similar to the NZE vowel in the word ‘dress’. The mid-high back vowel /o/ is similar to the vowel in NZE ‘thought’. The low vowel /a/ is similar to that found in NZE ‘start’. The quality of the long duration vowels is the same as that of the corresponding short vowels, differing only in their length. Long vowels are durationally at least twice as long as short vowels.

The canonical syllable shape for Samoan is CV fā ‘four’ or V ou ‘your’. The minimal shape of a word is a CV where the V is a long vowel or a vowel cluster. There are no words in Samoan that consist solely of a CV where the V is a short vowel.

All consonants of Samoan occur word initially. Unlike English which allows consonantal clusters, Samoan, does not permit clusters. Consonantal clusters in loan words from English are broken up by the insertion of an epenthetic vowel; for example, /kirisimisi/ ‘Christmas’ /puleke/ ‘brake’. Clusters of vowels such as [ie,uo,ei,ae] are however permitted in Samoan and are common. Pawley (1960) indicates that all vowel pairs occur and clusters of up to five
vowels are possible. Samoan vowel clusters are always articulated as individual vowels in sequence. This is in contrast to Māori where some vowel clusters are articulated as diphthongs while others are sequences of vowels (Maclagan et al., 2004).

Stress assignment in Samoan words is regular and determined by the type of vowel in the syllable. If the last syllable consists of a short vowel, the most prominent syllable within a Samoan word is the penultimate syllable; e.g., [noˈnofo] ‘sit’, [ˈfale] ‘house’. If the final syllable consists of a long vowel or a vowel cluster, stress will occur on that syllable; e.g., [taˈmaː] ‘father’, [vaˈʔai] ‘look.’

**The Assessment**

Given the range of phonemes available in Samoan, we set out to design an assessment which would enable a clinician to a) check the child’s speech sound inventory and b) analyse the child’s contrastive use of phonemes in the inventory. Assessments that target articulation and phonology typically test single word and/or connected speech production. The test presented here is restricted to single words.

**Content of the Assessment**

In developing a single word assessment we followed a similar format to that found in standardised phonology/articulation assessments in English and compiled a picture naming assessment to elicit the phonemes of Samoan. The assessment consists of 75 lexical items (see Appendix). The children that we assessed were shown full colour line drawings and photos for the words tested. The images used were downloaded from the internet and laminated and spiral bound in a booklet. With the exception of body part naming, each word was presented individually. We deliberately included lexical items such as /ʔato/ ‘bag, basket’, which would be familiar to the children either from literacy activities within the church or an early education setting. In comparison with the DEAP (Dodd et al., 2002), the assessment may seem overly long. However, our intention was to include more opportunities for children to produce the phonemes of Samoan in various combinations so that more information on the phonological skills of children in this language can be collected.

As consonants only occur as singletons in syllable onsets (word initially and intervocally), we attempted to include as many of these phonemes as possible in both positions. All consonants with the exception of /h/ (which only occurs in borrowings from English such as /helikopa/ ‘helicopter’) were included. Words with consonants exclusive to the formal register (/t, n, r/); e.g., /rapiti/ ‘rabbit’, /nifo/ ‘tooth’, /tusi/ ‘book’, were also in the assessment. As some children will be familiar with the formal register from church activities while others will not, both formal and colloquial register consonants were scored as correct in these items.

The assessment covered the short duration vowels of Samoan /i, e, a, u, o/ but did not include all the long duration vowels or vowel clusters. The long duration vowels /aː, oː, uː/ in /falesaː/ ‘church’, /soːuː/ ‘shovel’, /fetuː/ ‘star’ were assessed but vowel /i/ was omitted as it was difficult to find lexical items with this vowel which would be familiar to young children and easy to present in picture form. The combination of vowels permitted in Samoan is large so it was not possible to cover the entire range of vowel combinations. However, a range of vowel clusters (e.g., /laumei/ ‘turtle’) was examined.

In contrast to English, where a number of words are monosyllabic, Samoan words can often contain up to seven or eight syllables. As a consequence, a range of different syllable lengths and shapes were considered in the assessment (e.g., /aˈpoŋalevēleve/ ‘spider’). Assessing words with differing syllable shapes allowed for tracking differences in children’s articulatory skills, as well as providing information regarding stress assignment in Samoan.

**Assessment Procedures**

As noted in Carter, Lees, Murira, Gona, Neville and Newton (2005), a formal test situation where a child sits and converses with an adult is an unfamiliar activity for some cultures. This is certainly the case for Samoan children, as they are often uncomfortable interacting with an adult and dialogue between adults and children is not typical. In fact, children are expected to remain silent but observant in the company of adults, as cultural norms are more authoritarian and hierarchical in nature. The expectation for appropriate behaviour for children, coupled
together with the lack of experience in interacting with adults, has the consequence that children find the assessment situation strange and their inclination to speak is inhibited. From our experience, it is vital to enlist someone who is a Samoan speaker from the community as an assessor (in our case the second author). This person needs to build sufficient rapport with the child to make him/her feel comfortable in the assessment context.

As a consequence, we also recommend that the children be given ample time to respond to test items. They should not be required to respond immediately or quickly and can be prompted with the phrase *O le ā le mea lea?* (What is this?). If a child fails to produce the target word the assessor can prompt again, provide alternative choices, or ask the child to imitate. For the purposes of phonological analysis, imitation is an acceptable means for eliciting a response since our focus is on accuracy in regard to speech sounds as opposed to lexical knowledge (see Goldstein, 2001).

**Some Characteristics of Samoan Spoken by Preschoolers**

To date, there are no norms in Samoan but a detailed description of the phonological skills of 20 children aged between 4;0 and 4;11 using this assessment can be found in our earlier paper (Ballard & Farao, 2008). The children in this particular study are representative of the variability in Samoan language proficiency to be found in the community. The guidelines given here can therefore be used for all Samoan-speaking children, regardless of their level of proficiency in the language. The reader should refer to this article for full details, as only the general characteristics of the Samoan spoken by preschoolers are presented in this paper.

In terms of the phonological skills that Samoan-speaking four-year-olds have in their repertoire, we found that children had no difficulty articulating polysyllabic words and were on the whole intelligible to adults and peers alike. We found that the short vowels in their language had been mastered and they were able to articulate all of the consonants in their phonetic inventory. Research, however, indicates that some differences should be expected in the speech of children in their fifth year (Dodd, Holm, Zhu Hua & Broomfield, 2006). We found this to be true for the articulation of both vowels and consonants. For vowels, errors were found with the quantitative aspects of their articulation, as long duration vowels were not sufficiently long when compared to adult target forms. For consonants, errors of articulation or deletion were observed, in addition to code switching between the two registers.

**Code Switching Between Registers**

From our observation, bilingual preschoolers are not able to clearly differentiate between consonants of the formal register and those of the colloquial register in the picture-naming task. While most children use the formal register appropriately when producing lexical items with /t/ and /k/, they were less likely to do so with /n/ and /ŋ/ or /r/ and /l/. In fact, some children never produced the formal register consonants /n, r/ and restricted their use of this register to the consonant /t/. In scoring items which have any of these consonants, therapists will need to bear this in mind and score consonant variants from either register as correct.

**Phonological Errors**

The type of errors we have found to date for Samoan bilinguals are listed in Table 1. Of these errors, two are classified as patterns (word initial glottal stop deletion and lack of sufficient length in long duration vowels) because they occur in more than two instances in a child’s speech sample (Dodd, Holm, Zhu Hua & Broomfield, 2006). They are, in turn, established as age appropriate for four-year-olds as more than 10% of those assessed exhibited these patterns. Both error patterns are noteworthy as they would be termed as atypical from a monolingual perspective. For English, the deletion of a singleton consonant in word-initial position and a lack of mastery in vowels by five-years of age are both unusual and would be indicators of possible speech disorder. Research into bilingual phonological acquisition (Yavas & Goldstein, 1998; Zhu Hua & Dodd, 2006), however indicates that typically developing bilingual speakers can exhibit uncommon phonological patterns, as well as more common ones. As such, clinicians should not be surprised to find these particular phonological errors when assessing Samoan-speaking bilingual children.
The other errors indicated in Table 1 are labeled as sporadic, as there was not sufficient evidence from the data sample to classify these as distinct patterns for four-year-olds. Until further data from both younger and similar aged children are analysed we can at this stage only note that these types of errors occur in the speech of typically developing preschoolers.

**Transference Patterns**

As Samoan/English bilingual children are speakers of a minority language growing up within a context where English is dominant, they may use phonological patterns from English in their production of Samoan (see Yavaş & Goldstein, 1998). A salient example of such a transference pattern is found with the adoption of the phonetic characteristics of English /r/ in the articulation of /r/ in Samoan. This consonant is articulatorily a trill in Samoan but tends to be articulated as an approximant [ɹ] by these children. It is not difficult to see why they would choose to use an approximant for /r/, as this type of articulation would be heard frequently in an English language society. Furthermore the transference is facilitated by the fact that /r/ is not a phoneme of high frequency in Samoan. If this becomes established for adults as well, the transference of a new type of articulation into the language demonstrates that Samoan, as spoken in a bilingual context, can vary from any standard variant spoken in the original home country.

**Conclusion and Future Plans**

From our experience in designing an assessment for Samoan we found that a number of issues had an impact on the final form of the assessment. These included the choice of phonemes, the need for alternative scoring because of code switching in Samoan and the modification of test procedures in consideration of cultural differences. We hope that in addition to providing clinicians with a phonological assessment we have provided some useful background information on the language and culture.

We have mentioned briefly some of the characteristics of the speech of Samoan/English bilingual preschoolers based on the findings from the pilot of the assessment. This information can be used in a very restricted sense for a specific age range (four-year-olds) as a guideline for ruling out disorder in the phonological development.

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**Table 1.** Error classified as being sporadic or having a distinct pattern. Examples for consonant and vowel and syllable errors are provided.

<table>
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<th>Error Type</th>
<th>Example</th>
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<tbody>
<tr>
<td><strong>Sporadic Errors</strong></td>
<td></td>
</tr>
<tr>
<td>Consonants</td>
<td>deaspiration of /t/</td>
</tr>
<tr>
<td></td>
<td>denasalisation of /n/</td>
</tr>
<tr>
<td></td>
<td>devoicing of /v/</td>
</tr>
<tr>
<td></td>
<td>gliding of /v/, /r/ to [w], /l/ to [j]</td>
</tr>
<tr>
<td></td>
<td>debuccalisation of /s/ to [h]</td>
</tr>
<tr>
<td></td>
<td>substitution of /r/ to [n]</td>
</tr>
<tr>
<td>Vowels</td>
<td>qualitative changes in unstressed syllable e.g., /u/ as [a], /e/ as [i]</td>
</tr>
<tr>
<td></td>
<td>in vowel clusters e.g., /ei/ as [e], [ai] as [a:]</td>
</tr>
<tr>
<td>Syllables</td>
<td>deletion</td>
</tr>
<tr>
<td><strong>Pattern Errors</strong></td>
<td></td>
</tr>
<tr>
<td>Consonants</td>
<td>deletion of /ʔ/ initially</td>
</tr>
<tr>
<td>Vowels</td>
<td>long vs. short distinction: /a:/ vs. /a/</td>
</tr>
</tbody>
</table>
One of the reviewers asked whether the long/short vowel distinction is preserved in the speech of younger Samoan-speaking adults. Although there is to date no research on this, we have heard anecdotally that New Zealand born Samoans have difficulty with this distinction in polysyllabic words. We acknowledge that changes to vowel length could be occurring for Samoan-English bilinguals in a similar way to its occurrence in the speech of Māori English bilinguals (see Maclagan et al., 2004).
REFERENCES


### Appendix: Samoan word list presented in standard orthography (gloss) and using the International Phonetic Alphabet (IPA).  

<table>
<thead>
<tr>
<th>Samoan Word</th>
<th>Gloss</th>
<th>IPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. foliga</td>
<td>face</td>
<td>foliŋa</td>
</tr>
<tr>
<td>2. laulu</td>
<td>hair</td>
<td>laulu</td>
</tr>
<tr>
<td>3. ūlu</td>
<td>head</td>
<td>uːlu</td>
</tr>
<tr>
<td>4. mata</td>
<td>eye</td>
<td>mata</td>
</tr>
<tr>
<td>5. isu</td>
<td>nose</td>
<td>isu</td>
</tr>
<tr>
<td>6. gutu</td>
<td>mouth</td>
<td>ūtu</td>
</tr>
<tr>
<td>7. laugutu</td>
<td>lip</td>
<td>lauŋutu</td>
</tr>
<tr>
<td>8. nifo</td>
<td>tooth</td>
<td>nifo</td>
</tr>
<tr>
<td>9. talīga</td>
<td>ear</td>
<td>taliŋa</td>
</tr>
<tr>
<td>10. alāfau</td>
<td>cheek</td>
<td>alaːfau</td>
</tr>
<tr>
<td>11. auvae</td>
<td>chin</td>
<td>auvae</td>
</tr>
<tr>
<td>12. laualaufaiva</td>
<td>tongue</td>
<td>laualaufaiva</td>
</tr>
<tr>
<td>13. ua</td>
<td>neck</td>
<td>ua</td>
</tr>
<tr>
<td>14. tau’ai</td>
<td>shoulder</td>
<td>tauʔai</td>
</tr>
<tr>
<td>15. lima</td>
<td>hand/arm</td>
<td>lima</td>
</tr>
<tr>
<td>16. ogālima</td>
<td>arm</td>
<td>ogā:lima</td>
</tr>
<tr>
<td>17. tama’ilima</td>
<td>finger</td>
<td>tamaʔilima</td>
</tr>
<tr>
<td>18. pute</td>
<td>belly</td>
<td>pute</td>
</tr>
<tr>
<td>19. manava</td>
<td>stomach</td>
<td>manava</td>
</tr>
<tr>
<td>20. tapuvae</td>
<td>ankle</td>
<td>tapuvae</td>
</tr>
<tr>
<td>21. vae</td>
<td>leg/foot</td>
<td>vae</td>
</tr>
<tr>
<td>22. tulivae</td>
<td>heel</td>
<td>tulivae</td>
</tr>
<tr>
<td>23. tama’ivae</td>
<td>toe</td>
<td>tamaʔivae</td>
</tr>
<tr>
<td>24. fetū</td>
<td>star</td>
<td>fetuː</td>
</tr>
<tr>
<td>25. moega</td>
<td>bed</td>
<td>moena</td>
</tr>
<tr>
<td>26. tusi</td>
<td>book</td>
<td>tusi</td>
</tr>
<tr>
<td>27. kitara</td>
<td>guitar</td>
<td>kitara</td>
</tr>
<tr>
<td>28. ‘ato</td>
<td>basket</td>
<td>?ato</td>
</tr>
<tr>
<td>29. sāmala</td>
<td>hammer</td>
<td>saːmala</td>
</tr>
<tr>
<td>30. meata’alo</td>
<td>toy</td>
<td>meataʔalo</td>
</tr>
<tr>
<td>31. vao</td>
<td>bush/plant</td>
<td>vao</td>
</tr>
<tr>
<td>32. niu</td>
<td>coconut</td>
<td>niu</td>
</tr>
<tr>
<td>33. karoti</td>
<td>carrot</td>
<td>karoti</td>
</tr>
<tr>
<td>34. lanumūmū</td>
<td>red</td>
<td>lanumū:muː</td>
</tr>
<tr>
<td>35. lanumoana</td>
<td>blue</td>
<td>lanumoana</td>
</tr>
<tr>
<td>36. tama</td>
<td>child</td>
<td>tama</td>
</tr>
<tr>
<td>37. lanumeamata</td>
<td>green</td>
<td>lanumeamata</td>
</tr>
<tr>
<td>38. ‘ofu</td>
<td>clothes</td>
<td>?ofu</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Samoan Word</th>
<th>Gloss</th>
<th>IPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>39. se‘eva</td>
<td>shoe</td>
<td>seʔeva</td>
</tr>
<tr>
<td>40. laumei</td>
<td>turtle</td>
<td>laumei</td>
</tr>
<tr>
<td>41. povi</td>
<td>cow</td>
<td>povi</td>
</tr>
<tr>
<td>42. gata</td>
<td>snake</td>
<td>ŋata</td>
</tr>
<tr>
<td>43. moa</td>
<td>bird</td>
<td>moa</td>
</tr>
<tr>
<td>44. fe’e</td>
<td>octopus</td>
<td>feʔe</td>
</tr>
<tr>
<td>45. tuisi</td>
<td>chips</td>
<td>tuisi</td>
</tr>
<tr>
<td>46. suka</td>
<td>sugar</td>
<td>suka</td>
</tr>
<tr>
<td>47. talo</td>
<td>taro</td>
<td>talo</td>
</tr>
<tr>
<td>48. siamu</td>
<td>jam</td>
<td>siamu</td>
</tr>
<tr>
<td>49. i’a</td>
<td>fish</td>
<td>iʔa</td>
</tr>
<tr>
<td>50. faiototo’a</td>
<td>door</td>
<td>faiototoʔa</td>
</tr>
<tr>
<td>51. fu’aomoa</td>
<td>egg</td>
<td>fua:moa</td>
</tr>
<tr>
<td>52. fa’i</td>
<td>banana</td>
<td>faʔi</td>
</tr>
<tr>
<td>53. ipu</td>
<td>cup</td>
<td>ipu</td>
</tr>
<tr>
<td>54. lo’i</td>
<td>ant</td>
<td>lo’i</td>
</tr>
<tr>
<td>55. maile</td>
<td>dog</td>
<td>maile</td>
</tr>
<tr>
<td>56. rapi’i</td>
<td>rabbit</td>
<td>rapi’i</td>
</tr>
<tr>
<td>57. pu’a</td>
<td>pig</td>
<td>pu’a</td>
</tr>
<tr>
<td>58. namu</td>
<td>mosquito</td>
<td>namu</td>
</tr>
<tr>
<td>59. apoŋaleveleve</td>
<td>spider</td>
<td>apoŋaleveleve</td>
</tr>
<tr>
<td>60. teine</td>
<td>girl</td>
<td>teine</td>
</tr>
<tr>
<td>61. violi</td>
<td>purple</td>
<td>violi</td>
</tr>
<tr>
<td>62. lanumoli</td>
<td>orange</td>
<td>lanumoli</td>
</tr>
<tr>
<td>63. lanusamasama</td>
<td>yellow</td>
<td>lanusamasama</td>
</tr>
<tr>
<td>64. aisikulimi</td>
<td>ice cream</td>
<td>aisikulimi</td>
</tr>
<tr>
<td>65. rosa</td>
<td>rose</td>
<td>rosa</td>
</tr>
<tr>
<td>66. la’au</td>
<td>tree</td>
<td>la’au</td>
</tr>
<tr>
<td>67. kiona</td>
<td>snow</td>
<td>kiona</td>
</tr>
<tr>
<td>68. suō</td>
<td>shovel</td>
<td>suō</td>
</tr>
<tr>
<td>69. va’a</td>
<td>boat</td>
<td>vaʔa</td>
</tr>
<tr>
<td>70. fagu</td>
<td>bottle</td>
<td>faŋu</td>
</tr>
<tr>
<td>71. falesa</td>
<td>church</td>
<td>falesa:</td>
</tr>
<tr>
<td>72. mea:lofa</td>
<td>present</td>
<td>mea:lofa</td>
</tr>
<tr>
<td>73. leoleo</td>
<td>police</td>
<td>leoleo</td>
</tr>
<tr>
<td>74. ‘ofu moe</td>
<td>pyjamas</td>
<td>?ofu moe</td>
</tr>
<tr>
<td>75. ‘ofuvae pu’upu’u</td>
<td>shorts</td>
<td>?ofuvae puʔupuʔu</td>
</tr>
</tbody>
</table>
Speech and Language Status of Children in a Language Unit and a Comparison Group of Children in Mainstream Schooling

Clare McCann, PhD
Lucy Sparshott, BSLT
Suzanne C Purdy, PhD
Heather McQueen

1 Speech Science, Department of Psychology, The University of Auckland, New Zealand
2 Taranaki Base Hospital, New Plymouth New Zealand

The Ministry of Education, which provides funding support for the sole language unit in New Zealand, sought a review of services provided to the children to guide a decision about its future. This required an in-depth analysis of the characteristics of the children and the provision of speech-language therapy input. This study characterises the speech and language profiles of the children attending the language unit to identify their diagnoses. The profile of results indicated whether they were similar to children being educated in language unit settings in the United Kingdom (UK) and whether UK longitudinal data are relevant to this group of children. Seven children in the language unit (mean age 7;3 years) and seven age and language-age matched children in the mainstream (mean age 7;1 years) completed a battery of speech, language and nonverbal intelligence assessments. Additionally a parental report of personal and social skills needed for everyday living was completed. The profiles of speech and language strengths and weaknesses of both groups of children support the findings of Conti-Ramsden and Botting (1999) that there are distinct subgroups of children with language impairments, that these children have complex difficulties and that there is some level of change over time.

Children with language difficulties have problems with the acquisition and development of oral language. These children have been described in a variety of ways including ‘developmental aphasia’, ‘specific language impairment’, and ‘developmental disorders of language’, with new emerging terms including ‘specific grammatical language impairment’ or ‘word-finding difficulties’. Originially coined by Benton (1964), the term “specifically language impaired” (or “developmentally aphasic”) referred to children for whom the process of learning language was difficult, in the absence of peripheral impairments (such as deafness, malformation of the vocal apparatus, or paralysis of the speech musculature), general mental retardation (sic), severe emotional disorder, autism or acquired childhood aphasia (where there is known postnatal brain injury to areas that sub-serve language). More recently, diagnostic criteria for specific language impairment (SLI) exclude children with nonverbal performance IQ below a standard score of 85 (one standard deviation below the mean); hearing impairment; and/or recent episodes of otitis media with effusion; evidence of neurological dysfunction; oral structural abnormalities; abnormalities of oral motor function and difficulties with physical and social interactions (Leonard, 1998). Other authors have used a similar definition but with a less strict nonverbal IQ score. For example, Gillon (2000) excluded children in her study of children with “spoken language impairment” with standard scores below 80 on the Test of Nonverbal Intelligence-2 (TONI-2, Brown, Sherbenou, & Johnsen, 1990).

An exclusion model for SLI is commonly used in research studies where a ‘pure’ population of language-impaired children is required. However, this approach is not very useful for clinical situations as it implies that all that is required for understanding and diagnosing language disorder is the systematic elimination of other interfering...
factors. Language disorder is then what is left over that cannot otherwise be explained. This approach is unsatisfactory. While some children may appear to have problems with a single origin, in most cases there are multiple factors at play. Tager-Flusberg and Cooper (1999) questioned exclusionary approaches to the diagnosis of language impairment, because the profile of difficulties for children with SLI appears rather similar to children with a nonverbal IQ both above and below a standard score of 85. If we take a multifactorial view, there needs to be a definition by inclusion which recognises the contribution made by both extrinsic and intrinsic factors to the child’s development.

With a conventional definition of language disorder by inclusion, one could outline a language profile which, although associated with a history of hearing, learning, environmental and emotional difficulties, cannot be attributed to any one of these alone, or the sum of these. Additionally, one or more of the following may also be seen: a positive close family history of specific difficulty in language development; evidence of cerebral dysfunction either during development or based on the presence of neurological signs; a mismatch between the various subsystems of language in relation to other aspects of cognitive development; and failure to ‘catch up’ with generalised language help.

Prevalence

Language impairment is the most common developmental problem in pre-school children though the numbers reported in the literature vary tremendously. Law, Boyle, Harris, Harkness, and Nye (2000) reviewed the research in the area and reported estimates varying from 0.06-33.2% of the population (with a median of 4.68% for speech difficulties alone and 4.95% for language difficulties alone). According to Tomblin, Smith and Zhang (1997), approximately 7% of children have specific speech and language difficulties, with males (8%) affected more than females (6%). Genetic studies have attempted to establish a relationship between particular genotypes and SLI (Haines & Caramata, 2004), but these have been inconclusive, with the exception of the FOXP2 gene which is associated with severe expressive and receptive language difficulties (MacDermot et al., 2005). Children with relatives who themselves have learning or language problems, are more likely to have SLI (Bishop, 2002; Leonard, 1998; Pratt, Botting, & Conti-Ramsden, 2006).

Language delay versus language disorder?

The term language delay suggests the child will ‘catch up’. Bishop and Edmundson (1987) showed that this was true for the majority of children they studied. Deviant or disordered language, however, has a qualitatively different pattern of development. One of the most difficult tasks for the speech-language therapist working with young children is to predict which children will have confirmed language impairment and which will have transient language delay. There is no proven accurate means to determine this, but there are some factors which indicate that problems are likely to persist. In a 14-year follow-up study, Johnson and colleagues (2010) measured longitudinal speech and language outcomes of children with (n=112) and without (n=132) speech or language difficulties and found that difficulties tended to persist in participants with a history of impairment. Language performance was generally quite stable over time (the children were followed from age 5 to 25 years). Those with a history of language impairment showed poorer outcomes in communication, cognitive measures, academic status, educational attainment and occupational status than peers with speech-only impairments. A smaller (n=31) cross-sectional study by Poll, Betz and Miller (2010) identified the persistence of SLI into adulthood.

Although family history is a significant predictor of SLI (Lahey & Edwards, 1995), the link between family history and persistence of language problems has been questioned (Whitehurst et al., 1991). The current state of research suggests that the worst prognosis for language is for a child with borderline/low IQ (Clegg, Hollis, Mawhood, & Rutter, 2005), poor narrative retelling and expressive syntax skills (Botting, Faragher, Simkin, Knox, & Conti-Ramsden, 2001) and poor comprehension/receptive language skills (Law et al., 2000).

Subtypes of language impairment

Rapin and Allen (1987) carried out a three-year longitudinal study of 160 children and identified
six subtypes of language impairment. Based on this work, Conti-Ramsden, Crutchley and Botting (1997) and Conti-Ramsden and Botting (1999) followed 242 children (aged 7 and 8 years) longitudinally. They identified almost the same subgroups as Rapin and Allen (1987), which they termed clusters. Walsh (2005) has highlighted the negative impact of inconsistent terminology while others (Law, Tomblin, & Zhang, 2008; Tomblin & Zhang, 2006) have queried the subtyping, but in the absence of any alternative, the clusters have been used here as a point of comparison. Table 1 describes Conti-Ramsden and Botting’s (1999) clusters outlining the difficulties in speech and language.

Table 1. Specific Language Impairment according to six clusters, as defined by Conti-Ramsden and Botting (1999).

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Children with lexical-syntactic deficit syndrome</td>
<td>Difficulties with comprehension of grammar, word reading, story telling (but good phonology and adequate expressive vocabulary)</td>
</tr>
<tr>
<td>2  “Normal” children</td>
<td></td>
</tr>
<tr>
<td>3  Children with verbal dyspraxia</td>
<td>Problems with grammar comprehension, word reading, phonology and story telling (but good expressive vocabulary)</td>
</tr>
<tr>
<td>4  Children with phonological programming deficit syndrome</td>
<td>Similar to cluster 3 but better scores across the tests and poorer expressive vocabulary</td>
</tr>
<tr>
<td>5  Children with phonological-syntactic deficit syndrome</td>
<td>Poor at all tests</td>
</tr>
<tr>
<td>6  Children with semantic-pragmatic deficit syndrome</td>
<td>Problems telling a story (but good phonology, good expressive vocabulary, good word reading, and adequate grammar comprehension)</td>
</tr>
</tbody>
</table>

Setting aside the heterogeneity of SLI, researchers have identified specific markers that could facilitate the early identification of persistent difficulties. The markers of SLI have been identified as nonword repetition (Bishop, North, & Donlan, 1996; Conti-Ramsden, Botting, & Faragher, 2001; Gathercole & Baddeley, 1990), tense marking and other grammatical markers (Gopnik & Crago, 1991; Rice & Wexler, 1996) and sentence repetition (Conti-Ramsden et al., 2001). More recently, Taylor (2002) added that children with SLI omit finiteness markers (e.g., “she like milk”) beyond the age of 4-5 years when children would typically have adult-like use of these morphemes (e.g., “she likes milk”).

SLI in a language unit

Archibald and Gathercole (2006) provide a history to the creation of speech-language therapy service provision in a Language Unit (LU). It is acknowledged that there is considerable variation in the criteria for selection into a LU especially for different ages (Lindsay, Dockrell, Mackie & Letchford, 2005a, b). Although there is variation, the criteria largely specify that children entering a LU will have a diagnosis of speech, language and communication difficulties, and no additional educational, developmental or behavioural needs not commonly associated with these difficulties. At the time of this study, no such criteria existed in New Zealand. Children were recruited into the sole LU after parental and/or clinical referral. All of these children spent 100% of their school time in the LU.

The aim of the current study was to characterise the speech and language profiles of the children attending the LU (through a battery of assessments) in order to identify those meeting the criteria for SLI described above. The providers of special education support in New Zealand and local
clinicians advised that the children should be a homogenous group (i.e., all having dyspraxia), but given the rarity of this childhood disorder we anticipated more heterogeneity. The primary research question was; what are the speech and language characteristics of the children in New Zealand’s sole LU? A companion study sought to determine the effectiveness of the LU, but in order to do so we needed to understand the nature of the children’s deficits. We anticipated that by determining the complexity of communication difficulties experienced by the children, we would be in a position to guide the provision of more targeted speech and language therapy and to establish appropriate outcome measures when evaluating the effectiveness of the LU.

Method

Participants

Fourteen children participated in this study, three female and four male children who attended the LU and three female and four male children in a mainstream school (MS). The seven children in the LU were aged 5;6 years to 8;9 years (mean age 7;3) at the commencement of the assessment process. The ethnicity was Pakeha/New Zealand European for six of the children, and New Zealand Māori for one child. The seven children in MS were aged 5;05 years to 11;10 years (mean age 7;01) at the commencement of the assessment process. The ethnicity was Pakeha/New Zealand European for six children and Asian for one child. Ethical approval was sought and granted prior to the commencement of this study.

The two groups of children (LU & MS) were matched as closely as possible on the basis of their profile. A profile was developed for each child in the LU incorporating their age, test scores, teacher report, parental report and observation. The profile (see Figure 1 below) indicated levels of difficulty in nine areas (motor speech, articulation/phonology, expressive language, receptive language, social/pragmatic skills, cognition, fine motor, gross motor, attention/listening). Speech-language therapists working in special education were approached and asked to identify children on their caseload (in the MS) who matched the profiles of the children in the LU. This process of identifying a comparison group of children took some time.

Figure 1. An example of one child’s profile that was used for matching a child in the MS group. The child was female, aged 5;6 years and demonstrated behavioural difficulties and perceptual problems.

The assessment battery was administered to each child individually in their usual school setting (LU or MS). The testing took place over a seven-month period during term time. Children were usually seen weekly or in some cases daily as time commitments allowed. Every effort was made to complete entire assessments in one session. All assessments were administered by one of the authors with reliability checks carried out by one or more of the other three authors as required.

Assessments

The assessments were administered to both groups of children (LU and MS) in an attempt to analyse and compare their performance. It is important to note that while these assessments have not been ‘normed’ on the New Zealand population, they were utilised here in order to make reliable comparisons with the Conti-Ramsden and Botting studies. Until such time as the assessments have been normed locally we cannot assume that the standard scores and percentile ratings for the assessments accurately reflect the New Zealand population; however, they can still be useful in the interpretation of the children’s performance. A wide range of speech and language assessments was used to capture all aspects of the children’s speech, language and communication.

The assessments administered were the Test of Non-Verbal Intelligence - Version 3 (TONI-3) (Brown, Sherbenou & Johnsen, 1997); the British Picture Vocabulary Scale 2 (BPVS-II) (Dunn, Dunn, Whetton & Burley, 1997) which measures
receptive vocabulary; the Clinical Evaluation of Language Fundamentals - Preschool version (CELF-P) (Wiig, Secord & Semel, 1992), for the children who were under seven-years of age; and the Clinical Evaluation of Language Fundamentals - 3 (CELF-3) (Semel et al, 1995) for the children over seven-years of age; the Test for Reception of Grammar 2, (TROG-2) (Bishop, 2003), which measures receptive language at sentence level; the Renfrew Bus Story (Renfrew, 1997), which requires children to retell a novel story with the assistance of pictures. Although the reliability of this assessment is limited (Pankratz et al., 2007), it was included as a widely used measure of connected speech and expressive language. The Renfrew Bus Story distinguishes sentence complexity in terms of the number of subordinating clauses, the sentence length, the expressive vocabulary, the grammatical structure and the information expressed; the Nuffield Centre Dyspraxia Programme (Williams & Stephens, 2004), which was used to measure articulation and oromotor function; the Phonology Scale of the Diagnostic Evaluation of Articulation and Phonology (DEAP) (Dodd, Hue, Crosbie, Holm, & Ozanne, 2002), which provides an indication of the children’s phonological repertoire rather than their articulatory abilities; and the Test of Auditory Perceptual Skills (TAPS) (Gardner, 1996), which measures a person’s auditory-perceptual skills based on performance in seven subtests. While it is essential to consider the specific speech, language and cognitive abilities of the children (particularly with regard to their ability to access educational support and as a predictor of outcome), recent research has highlighted the importance of measuring everyday behaviours necessary for independent functioning (Webber, Jenkinson & McGillivray, 2002). Therefore, the Vineland-II Adaptive Behavior Scales were used to measure personal and social skills needed for everyday living based on parental report. Table 2 details each of the assessments used and their purpose.

Table 2. Assessments administered to the children in the language unit (LU) and mainstream school (MS) outlining their purpose and dependent variables

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test of Non-Verbal Intelligence – 3 (TONI-3)</td>
<td>Provides a measure of nonverbal intelligence from 6 to 89 years</td>
</tr>
<tr>
<td>British Picture Vocabulary Scale – 2 (BPVS-II)</td>
<td>Measures receptive vocabulary</td>
</tr>
<tr>
<td>Clinical Evaluation of Language Fundamentals - Preschool (CELF-P)</td>
<td>Measures receptive and expressive language in children less than seven years of age</td>
</tr>
<tr>
<td>Clinical Evaluation of Language Fundamentals - 3 (CELF-3)</td>
<td>Measures receptive and expressive language in children over seven years of age</td>
</tr>
<tr>
<td>Test for Reception of Grammar – 2 (TROG-2)</td>
<td>Measures receptive language at sentence level</td>
</tr>
<tr>
<td>Renfrew Bus Story</td>
<td>Measures expressive language by distinguishing sentence complexity</td>
</tr>
<tr>
<td>Nuffield Centre Dyspraxia Programme</td>
<td>Measures articulation and oromotor function</td>
</tr>
<tr>
<td>Phonology Scale of the Diagnostic Evaluation of Articulation and Phonology (DEAP)</td>
<td>Provides an indication of phonological repertoire rather than articulatory abilities</td>
</tr>
<tr>
<td>Test of Auditory Perceptual Skills (TAPS)</td>
<td>Measures auditory-perceptual skills</td>
</tr>
<tr>
<td>Vineland-II Adaptive Behavior Scales for Parents</td>
<td>Assesses personal and social skills from birth to 18 years</td>
</tr>
</tbody>
</table>
Results

Table 3 compares the two groups of children on each of the different measures. The mean raw scores, standard scores or percentile scores are given (depending on the type of measurement obtained from the assessment). The TONI-3 resulted in a wide variation in performance across the children. There was however, a relatively similar profile between the group of children in the LU and the MS. Much of the literature regarding diagnosis of SLI (see Leonard, 1998) minimally requires a non-verbal performance IQ standard score of 85 or above. As illustrated in Table 3, this would exclude some children in the LU and MS. Only two children fell below Gillon’s (2000) nonverbal IQ criterion of 80, however. Neither of these children would meet current criteria for entry into the LU. The BPVS-II saw a very wide variation across the standard scores in the group of children in the LU, suggesting a range of ability (and a narrower variation in the standard scores of the children in the MS).

The mean ‘total language’ standard scores for the CELF-P for the children less than seven years old, and the CELF-3 for children over seven years have been provided. This score is derived from each child’s performance on receptive and expressive language tasks. There were very severe expressive and receptive language difficulties in most of the children. The table provides the scores for the two groups of children. Two of the children in the MS and one child in the LU with better scores are delayed in their total language scores by one to two years compared to their age-peers and have severe deficits in specific areas. Two of these (both in the MS) have scores at the 1st-2nd percentile for one of the subtests of receptive or expressive language. One child in the MS was unintelligible for all expressive language test items and hence his expressive language score may underestimate his ability.

The TROG-2 demonstrated very poor performance (as evidenced by the standard scores).

Two of the children in the MS found the Renfrew Bus Story very difficult and were not able to complete it. Table 3 illustrates the relatively low scores for information, indicating the difficulty the children had in expressing themselves in connected speech.

The Nuffield Centre Dyspraxia Programme illustrated wide ranging performance so results have been considered according to the specific task requirements (that is, single sounds, CV or VC words, multisyllabic words, clusters, phrases and sentences). Several children did well for single sounds and simple words, but had great difficulty with more complex items. The intelligibility of the children (measured as percentage correct) was least accurate for multisyllabic words. With the exception of one child (in the MS group) intelligibility reduced for the more complex tasks.

The Phonology Scale of the DEAP indicated that a number of the children performed quite highly in the percentage of correct consonants produced (in a picture labelling task) with one child (in the MS group) scoring 100% indicating the relative ease she had with this assessment, and three others (one in the MS group and two in the LU group) all scoring over 90%.

Two children (one in the LU group and one in the MS group) found the TAPS-R extremely difficult and could not complete any tasks. Consequently, only the percentile scores have been provided in Table 3 as the standard scores could not be obtained for everyone.

The Vineland-II scores shown in Table 3 vary across sub-domains. As expected there are deficits in the Communication domain, but also considerable delays in Socialisation and Daily Living skills. The additional domain of Motor performance should only be administered to children below 6 years of age, so this domain has not been included here.

Both groups had low scores on all Vineland-II measures, but the children in the LU had lower average scores. Standard scores have a mean of 100 in the typically developing population and a standard deviation of 15. The magnitude of the difference in Vineland-II scores between the children in the LU and MS amounted to a full standard deviation. The Vineland results for the children in the LU in particular are consistent with the literature describing reduced scores in children with Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS) (Paul et al., 2004). The scores for children in the current study were compared statistically to the PDD-NOS results reported by Paul et al. (2004) using z-scores. Mean Vineland scores were
Table 3. Comparison of data from children in the language unit (LU) and mainstream school (MS).

<table>
<thead>
<tr>
<th>Subtest/measure</th>
<th>Type of measure</th>
<th>Group</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>TONI-3</td>
<td>Standard score</td>
<td>LU</td>
<td>91.14</td>
<td>16.26</td>
<td>89</td>
<td>66</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>93.14</td>
<td>10.35</td>
<td>95</td>
<td>76</td>
<td>104</td>
</tr>
<tr>
<td>BPVS</td>
<td>Standard score</td>
<td>LU</td>
<td>81.43</td>
<td>32.20</td>
<td>85</td>
<td>18</td>
<td>119</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>85.43</td>
<td>16.46</td>
<td>87</td>
<td>53</td>
<td>107</td>
</tr>
<tr>
<td>CELF-P/3</td>
<td>Standard score</td>
<td>LU</td>
<td>66.29</td>
<td>15.37</td>
<td>61</td>
<td>51</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>69.71</td>
<td>16.53</td>
<td>68</td>
<td>50</td>
<td>93</td>
</tr>
<tr>
<td>TROG-2</td>
<td>Standard score</td>
<td>LU</td>
<td>67.00</td>
<td>19.26</td>
<td>55</td>
<td>55</td>
<td>104</td>
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<tr>
<td></td>
<td></td>
<td>MS</td>
<td>68.86</td>
<td>13.73</td>
<td>62</td>
<td>55</td>
<td>90</td>
</tr>
<tr>
<td>Renfrew</td>
<td>Sentence length</td>
<td>Raw score</td>
<td>LU</td>
<td>11.71</td>
<td>5.09</td>
<td>10</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>10.14</td>
<td>8.65</td>
<td>7</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Information</td>
<td>Raw score</td>
<td>LU</td>
<td>6.81</td>
<td>3.72</td>
<td>7.2</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>13.11</td>
<td>12.86</td>
<td>7.80</td>
<td>0.00</td>
<td>33.60</td>
</tr>
<tr>
<td>Nuffield</td>
<td>Single sounds</td>
<td>% correct</td>
<td>LU</td>
<td>87%</td>
<td>11%</td>
<td>50%</td>
<td>64%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>92%</td>
<td>11%</td>
<td>95%</td>
<td>69%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>CV &amp; VC</td>
<td>% correct</td>
<td>LU</td>
<td>77%</td>
<td>35%</td>
<td>90%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>86%</td>
<td>26%</td>
<td>100%</td>
<td>30%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>CVCV</td>
<td>% correct</td>
<td>LU</td>
<td>79%</td>
<td>27%</td>
<td>90%</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>71%</td>
<td>32%</td>
<td>80%</td>
<td>10%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>CVC</td>
<td>% correct</td>
<td>LU</td>
<td>78%</td>
<td>33%</td>
<td>85%</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>76%</td>
<td>26%</td>
<td>80%</td>
<td>35%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Multi-syllabic</td>
<td>% correct</td>
<td>LU</td>
<td>37%</td>
<td>25%</td>
<td>90%</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>51%</td>
<td>34%</td>
<td>55%</td>
<td>5%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Clusters</td>
<td>% correct</td>
<td>LU</td>
<td>51%</td>
<td>31%</td>
<td>35%</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>60%</td>
<td>38%</td>
<td>75%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Phrases/sentences</td>
<td>% correct</td>
<td>LU</td>
<td>46%</td>
<td>28%</td>
<td>55%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>61%</td>
<td>36%</td>
<td>58%</td>
<td>0%</td>
<td>98%</td>
</tr>
<tr>
<td></td>
<td>DEAP</td>
<td>Phonology</td>
<td>% correct</td>
<td>LU</td>
<td>82%</td>
<td>19%</td>
<td>87%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>85%</td>
<td>14%</td>
<td>89%</td>
<td>62%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>TAPS-R</td>
<td>Percentile*</td>
<td>LU</td>
<td>7.00</td>
<td>16.32</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>4.07</td>
<td>4.29</td>
<td>2.0</td>
<td>&lt;1</td>
<td>12</td>
</tr>
<tr>
<td>Vineland-II</td>
<td>Communication</td>
<td>Standard score</td>
<td>LU</td>
<td>77.00</td>
<td>14.15</td>
<td>81</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>93.71</td>
<td>18.53</td>
<td>100</td>
<td>67</td>
<td>119</td>
</tr>
<tr>
<td>Daily Living</td>
<td>Standard score</td>
<td>LU</td>
<td>72.71</td>
<td>10.55</td>
<td>71</td>
<td>61</td>
<td>87</td>
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<td></td>
<td></td>
<td>MS</td>
<td>96.14</td>
<td>16.65</td>
<td>89</td>
<td>77</td>
<td>123</td>
</tr>
<tr>
<td>Socialisation</td>
<td>Standard score</td>
<td>LU</td>
<td>73.71</td>
<td>8.65</td>
<td>77</td>
<td>59</td>
<td>83</td>
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<td></td>
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<td>MS</td>
<td>91.14</td>
<td>11.91</td>
<td>94</td>
<td>78</td>
<td>109</td>
</tr>
</tbody>
</table>

*Percentiles were used for statistical analysis of the TAPS-R because standard scores could not be obtained for several children.
compared using two-sample z-tests. As shown in Table 4, although the scores of the children in the LU and children with PDD-NOS overlap, children in the current study have significantly better Vineland scores for all sub-domains. Scores for the children in the LU and MS were compared with results for the children with PDD-NOS using the two-sample z-statistic. If a correction is made to the \( p \) value for multiple comparisons (statistical significance of \( p < 0.008 \)), then the children in the LU differ significantly from the children with PDD-NOS only for the Socialisation sub domain, and the children in the MS differ significantly from the children with PDD-NOS for all sub domains.

<table>
<thead>
<tr>
<th>Age</th>
<th>IQ</th>
<th>Communication</th>
<th>Daily Living</th>
<th>Socialisation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PDD-NOS (n = 20)</strong></td>
<td>6.6 (1.2)</td>
<td>76.3 (13.0)</td>
<td>65.3 (13.6)</td>
<td>53.4 (16.8)</td>
</tr>
<tr>
<td><strong>LU (n = 7)</strong></td>
<td>7.1 (1.2)</td>
<td>91.1 (16.3)</td>
<td>77.0 (14.2) ( p = .064 )</td>
<td>72.7 (10.6) ( p = .009 )</td>
</tr>
<tr>
<td><strong>MS (n = 7)</strong></td>
<td>7.1 (2.3)</td>
<td>93.1 (10.4)</td>
<td>93.7 (18.5) ( p &lt; .001 )</td>
<td>96.1 (16.7) ( p &lt; .001 )</td>
</tr>
</tbody>
</table>

**Comparison of groups**

Mean and median scores for the various tests for the LU and MS groups are listed in Table 3. Means and medians generally agree, indicating approximately normal distributions of scores, with the exception of TAPS-R percentiles and several Nuffield percentage scores. For these two assessments there was a preponderance of very low scores, with just a few children performing relatively well. For the majority of assessments the two groups of children were very similar. The exception was the Vineland-II, for which parental ratings were generally lower for the children in the LU than the MS.

To determine whether group differences were statistically different one-way analyses of variance were performed, with age and TONI-3 scores included as covariates. Non-significant results should be interpreted with caution due to the lack of statistical power (with a small sample size). For the Renfrew Bus Story (Sentence Length, Information), CELF (Receptive, Expressive) and Nuffield tests, repeated measures analyses were performed with group as a between-subject variable and subtests as within-subject variables. Table 5 shows that the only significant group differences occurred for the Vineland-II parental ratings for Daily Living and Socialisation sub domains. Consistent with the speech and language assessment results, the Vineland-II scores did not differ for the Communication sub domain. TONI-3 nonverbal IQ scores had a significant effect on CELF language scores, TROG scores and Nuffield speech scores. As outlined above, the Nuffield scores differed significantly across sub-tests, with lower scores being recorded for more complex speech tasks.

**Discussion**

Prior to the commencement of the study it was widely thought by local clinicians and funders of the LU that the children had a primary diagnosis of dyspraxia (known variously as verbal dyspraxia, childhood or developmental apraxia of speech (CAS or DAS)). The definition of verbal dyspraxia is controversial, however, and has been widely debated in the speech and language therapy literature (Forrest, 2003). Conti-Ramsden and Botting (1999) referred to their Cluster 3 children as having verbal dyspraxia, but commented that they did not agree with Rapin and Allen’s (1987) conceptualisation of verbal dyspraxia as a subgroup of SLI. Their Cluster 3 children had good naming vocabulary but were poor for all other tests used in the study (problems with grammar comprehension, word reading, phonology and story-telling).
Although it was thought that children in the NZ LU had severe speech and language disorders characteristic of CAS, this proved not to be the case. The analysis presented here showed that only one child had marked signs of this diagnosis; and another child had mild-moderate signs. The performance of all the children in the LU indicated significant levels of language delay and/or disorder, however. The children’s profiles were therefore compared to those of participants in other studies that have investigated the communication difficulties of children with severe speech and language disorders (Conti-Ramsden & Botting, 1999; Conti-Ramsden, Crutchley, & Botting, 1997).

**Comparison of NZ children with the literature**

The children’s results on the battery of assessments were compared to the clusters identified by Conti-Ramsden and Botting (1999). Children in the New Zealand LU did not completely match the seven-year-olds recruited from LUs in the United Kingdom (UK) by Conti-Ramsden and colleagues (1997, 1999). Firstly, their age range was wider (5;06 to 8;09 years at the commencement of the current study). Secondly, they were assessed on different editions of the assessments and thirdly, they had experienced different amounts of intervention. Some of the New Zealand children had diagnoses that would have excluded them from Conti-Ramsden’s studies, and three of the seven children in the LU demonstrated low non-verbal IQ standard scores (< 85), which would have excluded them from the UK LU populations (note that only one child in each setting had a score < 80). Nevertheless, based on their relative strengths in phonology, articulation, receptive and expressive language, children were assigned to the matching cluster as described by Conti-Ramsden et al. (1997, p770-771). This was a straightforward process initiated by the fourth author and verified by the other three authors of the current study.

Just under half of the children in the LU (43%) were consistent with Conti-Ramsden and Botting’s (1999) diagnosis of lexical-syntactic deficit syndrome, experiencing difficulties with comprehension of grammar and story-telling, but with relatively better phonology and adequate expressive vocabulary. One child (14%) had results consistent with a diagnosis of verbal dyspraxia, demonstrating problems with grammar comprehension, phonology and story-telling, but expressive vocabulary (picture naming ability) was a relative strength. A further 29% had profiles consistent with the diagnosis of phonological-syntactic deficit syndrome; these children were

<table>
<thead>
<tr>
<th></th>
<th>Group</th>
<th>TONI-3</th>
<th>Age</th>
<th>Subtest</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPVS</td>
<td>0.865</td>
<td>0.070</td>
<td>0.659</td>
<td>-</td>
</tr>
<tr>
<td>CELF-Language</td>
<td>0.853</td>
<td>0.016</td>
<td>0.303</td>
<td>0.230</td>
</tr>
<tr>
<td>TROG-2</td>
<td>0.956</td>
<td>0.049</td>
<td>0.670</td>
<td>-</td>
</tr>
<tr>
<td>Renfrew</td>
<td>0.619</td>
<td>0.051</td>
<td>0.859</td>
<td>0.930</td>
</tr>
<tr>
<td>Nuffield</td>
<td>0.848</td>
<td>0.037</td>
<td>0.052</td>
<td>0.001</td>
</tr>
<tr>
<td>DEAP</td>
<td>0.914</td>
<td>0.093</td>
<td>0.116</td>
<td>-</td>
</tr>
<tr>
<td>TAPS-R</td>
<td>0.544</td>
<td>0.178</td>
<td>0.703</td>
<td>-</td>
</tr>
<tr>
<td>Vineland-II Communication</td>
<td>0.103</td>
<td>0.086</td>
<td>0.379</td>
<td>-</td>
</tr>
<tr>
<td>Vineland-II Daily Living</td>
<td>0.018</td>
<td>0.619</td>
<td>0.589</td>
<td>-</td>
</tr>
<tr>
<td>Vineland-II Socialisation</td>
<td>0.017</td>
<td>0.327</td>
<td>0.440</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 5. Results of statistical analyses (illustrated with p values) to determine whether children in the LU and MS differed significantly for any of the measures. Statistically significant effects (p < 0.05) are indicated in bold.
poor at all tests. One child’s (14%) profile did not match any of the clusters outlined above.

The children in the MS also did not match the Conti-Ramsden et al. (1997) clusters perfectly. This was not unexpected as they were approximately matched pair-wise with the children in the LU. The age range of the children in the MS was wider than the Conti-Ramsden et al (1997) children (5;03 to 11;10 years at the commencement of the study), and they were assessed on slightly different assessments. Two of the children in the MS were too young to have the non-verbal IQ assessment TONI-3 administered. One of the children achieved a low non-verbal IQ standard score (< 80), which would have excluded her from the diagnosis of SLI. Attempts were made to compare the children in the MS with the Conti-Ramsden studies and this resulted in 43% achieving best fit with Cluster One (lexical-syntactic deficit syndrome), 43% with Cluster 5 (phonological-syntactic deficit syndrome) and 14% with Cluster 6 (semantic-pragmatic deficit syndrome). This child had problems telling a story but had relatively good phonology, good expressive vocabulary and adequate grammar comprehension.

The profiles of speech and language strengths and weaknesses of the two groups support the findings of Conti-Ramsden and Botting (1999) that there are distinct subgroups of children with language impairments and these children have complex difficulties. The literature suggests there is some level of change over time with the individual children’s language profiles and this may be influenced by factors such as intervention (Conti-Ramsden & Botting, 1999) or the passage of time (Law, Tomblin & Zhang, 2008). Although some change might be expected, it is anticipated that children with receptive as well as expressive language difficulties will have ongoing communication (and learning) difficulties that are likely to persist beyond the school years (Clegg et al., 2005; Pratt et al., 2006).

Comparisons between children in the LU and MS settings

There was a wide range of nonverbal IQ scores and speech and language abilities in both groups of children. The matching of the two groups based on their profiles of difficulties was successful, as there were no significant differences between the groups for any of the speech and language measures, including the Vineland-II’s Communication sub domain. The significant group differences in parental ratings of Socialisation and Daily Living skills were a surprising finding however, with parents of the children in the LU reporting greater delay in these areas for their children. One question that arises from this finding is whether the parents of the children in the LU always had greater concern regarding these areas of their child’s development and this encouraged them to consider their child for the LU, or whether the MS environment has better fostered the development of these skills, or at least parents’ perceptions of the development of these skills. This question cannot be answered here, but is an important one for future research. It would be worthwhile including the Vineland-II Adaptive Behavior Scales as part of the pre-placement assessment when considering children’s eligibility for a LU, and as an outcome measure to assess progress.

It is clearly established that children with language impairments are at risk for social-behavioural difficulties (Beitchman et al., 1996; Clegg et al., 2005; Pratt et al., 2006; Tomblin, 2000). Hence it was not surprising that the Vineland-II Socialisation standard scores for children in the LU were similar to those reported by Paul et al. (2004) for children with pervasive developmental delay. This highlights the difficulty of accurately diagnosing these children as having a specific speech and language disorder at an early age, and supports the view that formalised assessments are important when determining appropriate educational provision for these children.
Conclusions

Approximately 6-7% of children have speech and language difficulties of which the majority will not have any other significant developmental difficulties (Law, Garrett & Nye, 2003; Tomblin et al., 1997). While most children’s difficulties resolve, those whose difficulties persist into primary school are likely to have long-term problems concerning literacy, socialisation, behaviour and school attainment. The provision of speech and language therapy for these children is necessary in order to reduce the long term effects on both learning and socialisation. The issue of educational provision raises questions about the appropriateness of such provision (whether in a LU or full inclusion in MS). Dockrell, Lindsay, Letchford and Mackie (2006) concluded that we need to be clear about the terminology used to describe the population, in order to optimise the contribution of speech-language therapists in the educational provision of these children. This is true whether the children are located within a LU or the MS. It is apparent from the data presented here that the children (in both the LU and MS) have very complex diagnoses. As a consequence, the children require very different speech and language interventions, and cannot be treated the same. Zigmond (2003 p.198) suggests that the “setting itself is less important than what is going on in the setting”. She rightly points out that good programmes can be developed in any setting, as can bad programmes. Language is a key foundation for learning and hence the severe receptive and expressive language difficulties in both groups of children are likely to have ongoing educational consequences. Additionally, Johnson et al. (2010) found that, consistent with several follow-up studies (Clegg et al. 2005; Hall & Tomblin 1978; Johnson et al., 1999; King et al., 1982; Poll, Betz & Miller, 2010; Records et al, 1992) a history of language disorders was predictive of multiple adverse outcomes in adulthood.

Contact Details

Please address correspondence to:
Dr Clare McCann
Department of Psychology (Speech Science)
Tamaki Campus
The University of Auckland
Private Bag 92019
Auckland, New Zealand.
c.mccann@auckland.ac.nz
REFERENCES


Phoneme Frequency in New Zealand English: What do Young Children Hear in Stories?

Ruth Hope, MAud
Margaret Maclagan, PhD

Department of Communication Disorders
University of Canterbury, Christchurch, New Zealand

This paper presents phoneme frequencies for New Zealand English (NZE) from materials gathered from children’s stories. The frequencies are calculated from material that is designed to be read to children rather than from conversation. They thus provide a good indication of the frequencies of phonemes in reading material that is presented to young children. The most frequent consonants were /t/, /ð/ and /n/ and the most frequent vowels were /ə/, /i/ and /ei/. A comparison is also provided between these frequencies and material available for British Received Pronunciation (RP) and American English (AmE). The main difference in the phoneme orders for the three varieties occur for the unstressed vowels and for /r/ which is more common in rhotic AmE than in non-rhotic NZE and RP.

For both effective and efficient treatment, speech-language therapists may need to know the relative frequency of phonemes in the language they are working with. Such information is also important for teachers of English as a second or other language (Brown, 1988) in that errors in more frequent phonemes may have a greater impact on intelligibility than errors in less frequent ones. Phoneme frequency analyses have existed for some time for British English (e.g., Crystal, 1997; Gimson, 1970, both of which are based on Fry, 1947) and American English (Mines, Hanson & Shoup, 1978). Versions are also available on-line (e.g., Higgins, 2002).

No phoneme frequencies are available for New Zealand English (NZE). Phoneme frequency in NZE may differ from frequency in other varieties of English because of mergers that occur in NZE but not in other varieties of English. NZE specific mergers include the vowel phonemes found in the words “NEAR” and “SQUARE” (usually on NEAR), and the neutralisation of vowel phonemes in words such as “DRESS” and “TRAP” (onto TRAP) before syllable final /l/ (see Maclagan, 2009). In this paper we are focusing on phonemes, rather than their precise phonetic pronunciation. We use Wells’ (1982) KEY WORDS to indicate both the phoneme contained in the word and the total set of words that contain that phoneme. For example, the key word, “TRAP” indicates the phoneme /æ/ and all words that contain /æ/. Because the consonants surrounding the vowels differ in each key word, the key words indicate phonemes clearly in all varieties of English. Although IPA (International Phonetic Association) symbols are widely used and recognised, different varieties of English use slightly different symbols for the same phoneme. British English, for example, uses /ɔʊ/ for GOAT where NZE uses /ou/. In a similar way, the same symbol may represent different phonemes in different varieties of English: /e/ represents DRESS in NZE but FACE in American English.

Phoneme frequencies can be calculated from either spoken or written text. Since speech-language therapists usually deal with speech, phoneme frequencies calculated from spoken material would be most useful. Although there are on-line corpora containing large bodies of spoken material, including spoken NZE material, many of them are not phonemically transcribed or marked in a way that would allow phoneme frequencies to be calculated. An on-line dictionary, where the entries are annotated phonemically, can be used to provide written phoneme frequencies because it gives a good indication of the total
number of words in the language. However, dictionaries usually do not give an indication of the frequency of use of the various words. When frequency of use of words, as well as frequency of use of individual phonemes is taken into account, a more meaningful list of phoneme frequencies is obtained. The readily available phoneme frequency lists for British English (Crystal, 1997; Gimson, 1970; Higgins, 2002) and for American English (Mines, Hanson & Shoup, 1978) are based on spoken data and so will not be completely comparable with the NZE data presented here. In spite of this, we consider that it is nevertheless useful to compare the NZE data with material that therapists can easily obtain on-line (Higgins, 2002). The main difference between frequency lists obtained from dictionaries and lists obtained from either spoken or written texts is the frequency of /ð/, which is higher in texts than in dictionaries because of the use of function words like the, this and that (Higgins, 2002) and /n/ which is higher because of words like in, on or and (Moates, Bond & Stockmal, 2002). A different problem can occur with older spoken frequency lists where a very formal pronunciation was often used (Higgins, 2002).

This paper presents a list of phoneme frequencies for NZE. The frequencies were calculated as part of a project to develop a NZE version of the Hearing in Noise Test (HINT) (Hope, 2009; Nilsson, Soli & Sullivan, 1994). The frequencies were calculated following the protocols developed by the House Ear Institute for the HINT. The protocols for the development of test materials recommend using short sentences from local children’s books. In order to calculate the phoneme frequencies, the written sentences were transcribed into phonemic script as they would normally be said in NZE. The basic material is thus written, but written for children. It represents the sort of language that young New Zealand children regularly hear in stories that are read to them.

METHODS

In order to develop a NZE version of the HINT, 507 sentences were gathered from a wide selection of New Zealand children’s books. Approximately 30 books by 24 different authors were consulted. The sentences were modified to be as natural as possible but only 5–7 syllables in length. The reduced length was to minimise any undue strain on memory for the HINT; for the purposes of phoneme frequency, it ensured that the material was suitably simple for children. Sentences were chosen to reflect common NZE vocabulary and sentence structure, but proper names, NZE slang, and unusual words were avoided. Once the 507 sentences were prepared they were assessed for naturalness. The sentences were distributed to five native speakers of NZE. They were asked to rate the sentences on a scale of 1–5, with 1 being “very unnatural; I would never say this” to 5 being “very natural; I would quite happily say this”. They were also asked to provide alternatives or suggestions as to how the naturalness of the lower rated sentences could be improved. The suggestions provided by the raters were then used to increase the naturalness of any sentences with an average rating of less than 4.5. The resulting sentences were reviewed by a linguist and an audiologist. During this process, 41 sentences were altered and 5 eliminated, to give a total of 502 sentences which were judged to be simple, natural and appropriate for NZE (see Appendix). The first author, who is a native speaker of NZE, transcribed the sentences into phonemic script as they would be spoken (for details on features of spoken English see Shockey, 2003). Both authors discussed the transcription of the first 50 sentences and agreed on the conventions which are discussed in the next section. The second author, who is a trained phonetician and has lived in NZ for many years, then checked the transcription of every 10th sentence. There was agreement on over 90% of the phonemes in the checked sentences. The total number of sounds analysed was 8,108 with 5016 consonants and 3092 vowels.

Conventions

Transcription conventions concerned the choice of which phoneme to use in situations where phonemes are merging and conventions with respect to connected speech. The following conventions were agreed on:

Issues with NZE phonemes:
- The vowels near /iə/ and square /eə/ are merging towards a closer /iə/-like realisation in NZE (Maclagan, 2009). It was agreed to use conventionally different
transcriptions for these vowels, even though young children would probably not distinguish between them.

- The vowels dress and trap are merging on trap before syllable final /l/, as are foot, goose and thought (on a vowel that is usually close to thought) and lot and goat (on a sound for which the key word gold is used, and that is usually transcribed as /d/u/). Again it was decided to use the traditional phoneme in the initial transcription.

- Unstressed syllables. Many speakers of NZE use the kit vowel, /ɪ/ in unstressed syllables, where it is indistinguishable from schwa /ə/ (Hay, Maclagan & Gordon, 2008). Schwa was used to transcribe unstressed vowels and the kit vowel, /ɪ/, was only used in stressed syllables.

Issues with connected speech:

The sentences were transcribed as they would normally be said in clear speech with all usual assimilations and elisions. In particular, we included the following:

- NZE is non-rhotic except for the nurse vowel for some speakers in the southern region of the South Island. /r/ was therefore only transcribed pre-vocally.

- Linking /r/ was included in all contexts, because it is usually used in NZE. An example of linking /r/ occurred in ‘her granddaughter’ is tiny’ where the /r/ at the end of granddaughter, which would usually not be pronounced in NZE, would be pronounced because of the following vowel. There were very few possible examples of intrusive /r/ in the sentences (‘they saw -r- a rainbow’). It was not transcribed.

- We did not include a linking /w/ in sentences like ‘she had to (w) empty her plate’.

- We used /ði/ for the before vowels and /ðə/ elsewhere, even though many NZE speakers now use /ðə/ for all unstressed to (Davies, Hornibrook, Lang, Nicolson & Maclagan, 2006).

- We included all normal assimilations so the first ‘d’ in handstands was omitted /hænstændz/. (It is, of course, possible to omit both occurrences of /d/ in this word.) And in bed was transcribed as /im bed/.

- We did not transcribe all initial /h/ in pronouns, but since pronunciation here is varied, we erred on the side of transcribing the /h/ rather than omitting it. Values for /h/ may therefore be slightly high.

- Syllable-final /l/ is usually vocalized in NZE. Vocalised /l/ was still counted as an example of the phoneme /l/

RESULTS AND DISCUSSION

The percentage usage of phonemes in the 502 sentences analysed with consonants and vowels ranked separately is presented in Table 1. As expected, the unstressed vowel, schwa, at 13.23%, is the most frequent phoneme in this database (ranked first among the vowels) followed by /t/ at the much lower rate of 7.46% and then /ð/, /n/, /d/ and /s/ (ranked 2-5 in the consonants). The relatively high percentage of 5.90% for /ð/ together with the relatively low percentage of 1.30% for price (/ai/), probably reflects the fact that the material is designed to be read, rather than being spoken conversations. The, this and that are more common in stories than conversations, and I is more common in conversations than stories.

The overall phoneme percentage frequencies of NZE consonants are compared with their frequencies in Received Pronunciation (RP) and American English (AmE) in Table 2. The vowels are similarly compared in Table 3. The English and American data are both relatively old, with the English data based on Fry (1947) and the American data on Mines et al. (1978). Both are based on conversational data. The American data are based on 26 ten-minute conversational interviews, but the only detail available for the English data is that it is based on ‘colloquial RP’ (Gimson, 1970). The AmE database was larger than the NZE database, and it is likely that the RP database also contained more tokens that the NZE database described here. A difficulty in
interpreting the AmE data arose because Mines et al. (1978) included categories like /ɪ~ɛ/ or /ʊ~u/ where it was difficult to identify the precise phoneme used by the speaker. For this analysis, /ɪ~ə/ was coded as /ə/, /t~ɾ/ as /t/, and syllabic /m/ and /n/ were added to non-syllabic /m/ and /n/ but it was difficult to decide where to place some of the other categories. Altogether, we were unable to allocate 3.58% of the AmE data to one of the categories in Tables 2 and 3.

Table 1: Percentage use and order of consonants and vowels in New Zealand English (NZE). The phonemic symbols are those usually applied for transcription of NZE (Maclagan, 2009).

<table>
<thead>
<tr>
<th>Rank</th>
<th>Consonant</th>
<th>Percent frequency</th>
<th>Rank</th>
<th>Vowel</th>
<th>Percent frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>/t/</td>
<td>7.46%</td>
<td>1</td>
<td>Schwa /ə/</td>
<td>13.23%</td>
</tr>
<tr>
<td>2</td>
<td>/ð/</td>
<td>5.90%</td>
<td>2</td>
<td>Fleece /i/</td>
<td>4.11%</td>
</tr>
<tr>
<td>3</td>
<td>/n/</td>
<td>5.41%</td>
<td>3</td>
<td>Face /ei/</td>
<td>2.48%</td>
</tr>
<tr>
<td>4</td>
<td>/d/</td>
<td>4.77%</td>
<td>4</td>
<td>Kit /ɪ/</td>
<td>2.32%</td>
</tr>
<tr>
<td>5</td>
<td>/s/</td>
<td>4.28%</td>
<td>5</td>
<td>Lot /ɒ/</td>
<td>1.96%</td>
</tr>
<tr>
<td>6</td>
<td>/l/</td>
<td>3.81%</td>
<td>6</td>
<td>Dress /e/</td>
<td>1.69%</td>
</tr>
<tr>
<td>7</td>
<td>/k/</td>
<td>3.76%</td>
<td>7</td>
<td>Strut /ʌ/</td>
<td>1.68%</td>
</tr>
<tr>
<td>8</td>
<td>/w/</td>
<td>3.37%</td>
<td>8</td>
<td>Trap /æ/</td>
<td>1.49%</td>
</tr>
<tr>
<td>9</td>
<td>/z/</td>
<td>2.92%</td>
<td>9</td>
<td>Thought /ə/</td>
<td>1.34%</td>
</tr>
<tr>
<td>10</td>
<td>/r/</td>
<td>2.82%</td>
<td>10</td>
<td>Price /ai/</td>
<td>1.30%</td>
</tr>
<tr>
<td>11</td>
<td>/m/</td>
<td>2.69%</td>
<td>11</td>
<td>Goose /u/</td>
<td>1.13%</td>
</tr>
<tr>
<td>12</td>
<td>/p/</td>
<td>2.31%</td>
<td>12</td>
<td>Goat /ou/</td>
<td>1.13%</td>
</tr>
<tr>
<td>13</td>
<td>/h/</td>
<td>2.20%</td>
<td>13</td>
<td>Mouth /au/</td>
<td>0.94%</td>
</tr>
<tr>
<td>14</td>
<td>/b/</td>
<td>1.75%</td>
<td>14</td>
<td>Start /a/</td>
<td>0.91%</td>
</tr>
<tr>
<td>15</td>
<td>/f/</td>
<td>1.67%</td>
<td>15</td>
<td>Nurse /æ/</td>
<td>0.91%</td>
</tr>
<tr>
<td>16</td>
<td>/ʃ/</td>
<td>1.67%</td>
<td>16</td>
<td>Foot /u/</td>
<td>0.67%</td>
</tr>
<tr>
<td>17</td>
<td>/v/</td>
<td>1.12%</td>
<td>17</td>
<td>Square /eə/</td>
<td>0.30%</td>
</tr>
<tr>
<td>18</td>
<td>/g/</td>
<td>1.11%</td>
<td>18</td>
<td>Gold /du/</td>
<td>0.25%</td>
</tr>
<tr>
<td>19</td>
<td>/ŋ/</td>
<td>0.97%</td>
<td>19</td>
<td>Choice /ɔi/</td>
<td>0.19%</td>
</tr>
<tr>
<td>20</td>
<td>/tʃ/</td>
<td>0.67%</td>
<td>20</td>
<td>Near /iə/</td>
<td>0.11%</td>
</tr>
<tr>
<td>21</td>
<td>/θ/</td>
<td>0.48%</td>
<td>21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>/j/</td>
<td>0.47%</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>/dʒ/</td>
<td>0.25%</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>/ʒ/</td>
<td>0.01%</td>
<td>24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Although the most frequent sound in all three varieties of English is schwa (Table 3), the order of the other phonemes is different. From Table 2 it can be seen that, apart from /l/ for AmE, the top 11 consonants are common across all three varieties. /l/ at 23 is much lower for AmE compared to 5 for RP and 6 for NZE. The AmE ranking is not accurate because Table 3 of Mines et al. (1978: 227) on which this analysis is based, contained only syllabic /l/ with syllable initial /l/ not appearing at all. This appears to be an accidental omission. The lower ranking of /r/ in NZE (10) and RP (6) compared to AmE (3) is due to the rhotic nature of the variety of AmE used by Mines et al. (1978). It is possible that /n/ is slightly lower for NZE (at 3) than for RP and AmE (where it is 1) because the short NZE sentences did not contain many examples of and. The phoneme /ʃ/ which is 19 for RP and 20 for AmE is probably higher (at 16) for NZE because of the frequent use of she in stories. We can see no reason why /v/ in RP (12) and AmE (13) is higher than in NZE (17). The bottom 5 consonants are the same for NZE and RP, though only three of them appear in the bottom places of the AmE list.

### Table 2: Comparison of percentage frequencies of the consonants of New Zealand English, Received Pronunciation and American English.

<table>
<thead>
<tr>
<th>Phoneme</th>
<th>New Zealand English Rank</th>
<th>Percent</th>
<th>Received Pronunciation Rank</th>
<th>Percent</th>
<th>American English Rank</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>/t/</td>
<td>1</td>
<td>7.46%</td>
<td>2</td>
<td>6.42%</td>
<td>2</td>
<td>5.98%</td>
</tr>
<tr>
<td>/ð/</td>
<td>2</td>
<td>5.90%</td>
<td>8</td>
<td>3.56%</td>
<td>6</td>
<td>3.14%</td>
</tr>
<tr>
<td>/s/</td>
<td>3</td>
<td>5.41%</td>
<td>1</td>
<td>7.58%</td>
<td>1</td>
<td>7.18%</td>
</tr>
<tr>
<td>/ʃ/</td>
<td>4</td>
<td>4.77%</td>
<td>3</td>
<td>5.14%</td>
<td>5</td>
<td>3.33%</td>
</tr>
<tr>
<td>/l/</td>
<td>5</td>
<td>4.28%</td>
<td>4</td>
<td>4.81%</td>
<td>4</td>
<td>4.61%</td>
</tr>
<tr>
<td>/l/</td>
<td>6</td>
<td>3.81%</td>
<td>5</td>
<td>3.66%</td>
<td>23</td>
<td>0.37%</td>
</tr>
<tr>
<td>/k/</td>
<td>7</td>
<td>3.76%</td>
<td>9</td>
<td>3.09%</td>
<td>7</td>
<td>3.10%</td>
</tr>
<tr>
<td>/w/</td>
<td>8</td>
<td>3.37%</td>
<td>10</td>
<td>2.81%</td>
<td>9</td>
<td>2.82%</td>
</tr>
<tr>
<td>/z/</td>
<td>9</td>
<td>2.92%</td>
<td>11</td>
<td>2.46%</td>
<td>10</td>
<td>2.75%</td>
</tr>
<tr>
<td>/t/</td>
<td>10</td>
<td>2.82%</td>
<td>6</td>
<td>3.51%</td>
<td>3</td>
<td>4.90%</td>
</tr>
<tr>
<td>/m/</td>
<td>11</td>
<td>2.69%</td>
<td>7</td>
<td>3.22%</td>
<td>8</td>
<td>3.06%</td>
</tr>
<tr>
<td>/p/</td>
<td>12</td>
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<td>15</td>
<td>1.78%</td>
<td>12</td>
<td>1.79%</td>
</tr>
<tr>
<td>/h/</td>
<td>13</td>
<td>2.20%</td>
<td>16</td>
<td>1.46%</td>
<td>15</td>
<td>1.31%</td>
</tr>
<tr>
<td>/b/</td>
<td>14</td>
<td>1.75%</td>
<td>13</td>
<td>1.97%</td>
<td>11</td>
<td>1.90%</td>
</tr>
<tr>
<td>/t/</td>
<td>15</td>
<td>1.67%</td>
<td>14</td>
<td>1.79%</td>
<td>14</td>
<td>1.55%</td>
</tr>
<tr>
<td>/ʃ/</td>
<td>16</td>
<td>1.67%</td>
<td>19</td>
<td>0.96%</td>
<td>20</td>
<td>0.56%</td>
</tr>
<tr>
<td>/v/</td>
<td>17</td>
<td>1.12%</td>
<td>12</td>
<td>2.00%</td>
<td>13</td>
<td>1.74%</td>
</tr>
<tr>
<td>/g/</td>
<td>18</td>
<td>1.11%</td>
<td>18</td>
<td>1.05%</td>
<td>16</td>
<td>1.18%</td>
</tr>
<tr>
<td>/ŋ/</td>
<td>19</td>
<td>0.97%</td>
<td>17</td>
<td>1.15%</td>
<td>18</td>
<td>1.08%</td>
</tr>
<tr>
<td>/ʃ/</td>
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<td>0.67%</td>
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<td>0.41%</td>
<td>22</td>
<td>0.50%</td>
</tr>
<tr>
<td>/θ/</td>
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<td>0.48%</td>
<td>23</td>
<td>0.37%</td>
<td>19</td>
<td>0.70%</td>
</tr>
<tr>
<td>/j/</td>
<td>22</td>
<td>0.47%</td>
<td>20</td>
<td>0.88%</td>
<td>17</td>
<td>1.09%</td>
</tr>
<tr>
<td>/dʒ/</td>
<td>23</td>
<td>0.25%</td>
<td>21</td>
<td>0.60%</td>
<td>21</td>
<td>0.56%</td>
</tr>
<tr>
<td>/ʒ/</td>
<td>24</td>
<td>0.01%</td>
<td>24</td>
<td>0.10%</td>
<td>24</td>
<td>0.09%</td>
</tr>
</tbody>
</table>

Ranks for Received Pronunciation based on Fry (1947).

Although the most frequent sound in all three varieties of English is schwa (Table 3), the order of the other phonemes is different. From Table 2 it can be seen that, apart from /l/ for AmE, the top 11 consonants are common across all three varieties. /l/ at 23 is much lower for AmE compared to 5 for RP and 6 for NZE. The AmE ranking is not accurate because Table 3 of Mines et al. (1978: 227) on which this analysis is based, contained only syllabic /l/ with syllable initial /l/ not appearing at all. This appears to be an accidental omission. The lower ranking of /r/ in NZE (10) and RP (6) compared to AmE (3) is due to the rhotic nature of the variety of AmE used by Mines et al. (1978). It is possible that /n/ is slightly lower for NZE (at 3) than for RP and AmE (where it is 1) because the short NZE sentences did not contain many examples of and. The phoneme /ʃ/ which is 19 for RP and 20 for AmE is probably higher (at 16) for NZE because of the frequent use of she in stories. We can see no reason why /v/ in RP (12) and AmE (13) is higher than in NZE (17). The bottom 5 consonants are the same for NZE and RP, though only three of them appear in the bottom places of the AmE list.
Table 3: Comparison of percentage frequencies of the vowels of New Zealand English, Received Pronunciation, and General American English.

<table>
<thead>
<tr>
<th>Phoneme</th>
<th>New Zealand English</th>
<th>Received Pronunciation</th>
<th>American English</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent</td>
<td>Rank</td>
<td>Percent</td>
</tr>
<tr>
<td>Schwa /ə/</td>
<td>1</td>
<td>13.23%</td>
<td>1</td>
</tr>
<tr>
<td>Fleece /i/</td>
<td>2</td>
<td>4.11%</td>
<td>7</td>
</tr>
<tr>
<td>Face /ei/</td>
<td>3</td>
<td>2.48%</td>
<td>6</td>
</tr>
<tr>
<td>Kit /ɪ/</td>
<td>4</td>
<td>2.32%</td>
<td>2</td>
</tr>
<tr>
<td>Lot /ɒ/</td>
<td>5</td>
<td>1.96%</td>
<td>10</td>
</tr>
<tr>
<td>Dress /e/</td>
<td>6</td>
<td>1.69%</td>
<td>3</td>
</tr>
<tr>
<td>Strut /ʌ/</td>
<td>7</td>
<td>1.68%</td>
<td>5</td>
</tr>
<tr>
<td>Trap /æ/</td>
<td>8</td>
<td>1.49%</td>
<td>9</td>
</tr>
<tr>
<td>Thought /ɑ/</td>
<td>9</td>
<td>1.34%</td>
<td>11</td>
</tr>
<tr>
<td>Price /ai/</td>
<td>10</td>
<td>1.30%</td>
<td>4</td>
</tr>
<tr>
<td>Goose /u/</td>
<td>11</td>
<td>1.13%</td>
<td>12</td>
</tr>
<tr>
<td>Goat /ʊ/</td>
<td>12</td>
<td>1.13%</td>
<td>8</td>
</tr>
<tr>
<td>Mouth /au/</td>
<td>13</td>
<td>0.94%</td>
<td>15</td>
</tr>
<tr>
<td>Start /a/</td>
<td>14</td>
<td>0.91%</td>
<td>14</td>
</tr>
<tr>
<td>Nurse /a/</td>
<td>15</td>
<td>0.91%</td>
<td>16</td>
</tr>
<tr>
<td>Foot /u/</td>
<td>16</td>
<td>0.67%</td>
<td>13</td>
</tr>
<tr>
<td>Square /ɑ/</td>
<td>17</td>
<td>0.30%</td>
<td>17</td>
</tr>
<tr>
<td>Gold /dʊ/</td>
<td>18</td>
<td>0.25%</td>
<td>-</td>
</tr>
<tr>
<td>Choice /ə/</td>
<td>19</td>
<td>0.19%</td>
<td>19</td>
</tr>
<tr>
<td>Near /iə/</td>
<td>20</td>
<td>0.11%</td>
<td>18</td>
</tr>
</tbody>
</table>

Ranks for Received Pronunciation based on Fry (1947).

The major difference in the top vowels in Table 3 is due to the vowels used in unstressed syllables. In NZE, it is difficult to tell whether kit or schwa is being used in unstressed syllables. As noted above, we decided to use kit only for vowels in stressed syllables and to identify vowels in unstressed syllables as schwa. This explains the somewhat lower ranking for kit at 4 in NZE compared with 2 in RP and 3 in AmE. The NZE rank is probably a more accurate indication of the frequency of stressed kit vowels. In addition, NZE and AmE use fleece in the final syllable of words like city where RP uses kit. This adds to the high ranking of kit in RP and explains why fleece has a higher ranking in NZE and AmE (2 in both) than in RP (7). Another difficulty with the unstressed vowels was the way they were coded by Mines et al. (1978). For this analysis, /i~ə/ was coded as /a/, but it was too difficult to interpret an appropriate coding for some categories which probably also represented unstressed vowels.

Overall, it is more difficult to compare vowels across varieties than consonants. Because AmE is generally rhotic, it does not have a direct comparison for start which appears mainly before /r/ in NZE and RP. Nor does AmE include near and square in its phoneme list. The phoneme /ɑ/ was interpreted as start for RP but as lot for
AmE. The AmE list included /ɔ/, which would indicate that the recorded speakers did not have the cot/caught merger which merges lot and thought. In spite of our care, the percentages for lot and thought may not be accurate for AmE. The evidence for this suggestion is provided by the relatively high rank for lot in NZE (5 rather than 10 for RP and AmE). face, at rank 3, is higher for NZE than the other two varieties, where it is 6 (RP) and 8 (AmE). This is most likely because of the use of they and time words, like today and yesterday and also away which were frequent in the story format sentences used for NZE. We can see no reason why dress is lower for NZE (6) than for RP (3) and AmE (4). We have included the NZE vowel gold, which merges lot and goat before /l/, in the NZE list, although it does not appear in the other lists. Tour occurs only in the RP list. It is so marginal in NZE that we did not include it and it is not part of the inventory for AmE. The NZE merger of the vowels near and square has not changed the order of vowels for NZE. Had we combined them, their percentage occurrence would have been 0.41%, and this would not have raised them above the current position of square on the list.

The sample used by Mines et al. (1978) contained 103,887 phonemes, which is 12 times larger than the NZE sample of 8,108 sounds. We do not know how many sounds were analysed for the RP sample. It is possible that increasing the number of sounds analysed for NZE would have brought the order of phonemes closer to that for the other two varieties, but we have no way of knowing.

**CONCLUSIONS**

Until now, information on phoneme frequency in NZE has been extrapolated from phoneme frequency analyses of AmE and RP, some of which are more than 60 years old. This newer, NZE-specific phoneme frequency analysis was conducted using a corpus of 502 sentences collected during the process of developing the NZ HINT. The most significant differences, reflecting true differences in phoneme frequency, were found with kit, /r/ and fleece. The lower ranking of NZE kit compared to RP and AmE suggests a more accurate approximation of the number of stressed kit occurrences in everyday speech. The lower ranking of /r/ in NZE compared to AmE is a result of the generally non-rhotic NZE dialect. The higher ranking of fleece in NZE compared to RP is due to the tensing of kit in word-final position as in city, resulting in a higher number of fleece tokens. It is suggested that some of the other differences are due to the story-based structure of the NZE sentences used. The NZE data is based on stories written for children while the RP and AmE data is based on conversations. The different sources of the data have not prevented genuine similarities and differences appearing between the three varieties.

This study provides an up-to-date analysis of phoneme frequency in NZE. It is based on a collection of sentences modified from children’s books and as such is a good representation of the language that young NZ children are exposed to in books. This information is relevant in speech language therapy, teaching of English as a second language, linguistics and other language-related fields.

**Acknowledgments**

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**Contact Details**

Please address correspondence to Assoc Professor Margaret Maclagan
Department of Communication Disorders
College of Science
University of Canterbury
Private Bag 4800
Christchurch, NEW ZEALAND
margaret.maclagan@canterbury.ac.nz
REFERENCES


APPENDIX

1 She waited at the back door  2 The blanket covered them  252 The woman dropped her keys  253 They took it down the hill
2 They all had to leave  254 The list of names was read out  255 There are none to spare
3 We made a fire out of sticks  256 His parents argued often  256 His parents argued often
4 The waves crashed on the beach  257 They ran back and forth  258 The policeman shouted
5 Everyone sat on the bed  259 He couldn’t find a seat  260 The fire warmed their hands
6 They swam in the river  261 They made a hole in the wall  262 The shovel was brand new
7 The ducklings walked in a line  263 The butter was expensive  264 They collected the eggs
8 He looked at the rainbow  265 Knives are dangerous  266 Most people like chocolate
9 They swam in the river  267 We need some hot water  268 They bought some new clothes
10 The waves crashed on the beach  269 Books were piled on the shelves  270 They looked like sisters
11 They swam in the river  271 They put up the tent  272 We brushed sand off our jeans
12 They swam in the river  273 She felt a lot better  274 The baby has woken up
13 They swam in the river  275 The play was a great success  276 We don’t need any carrots
14 They swam in the river  277 The blanket covered them  252 The woman dropped her keys
15 They swam in the river  253 They took it down the hill  254 The list of names was read out
The family stopped to rest
Mum taught me to swim
The boy burst out laughing
The game finished early
Most of the logs were rotten
He called out to his daughter
His father hoped they would win
They waded out to the raft
The farmer yelled at the dogs
The paddock was muddy
The slips had holes in them
The spider made a web
A few cars went down the road
The man was very strong
The teacher sat in her chair
The kitten played with the string
The builder climbed the ladder
The player lost his shoe
She forgot about the cake
The children laughed at the show
She’s out walking the dog
They’re not going anywhere
The boy played in the snow
She sat down on a rock
He’s coming back for tea
Dad forgot to get the milk
My brother talks too much
She’s thinking about Christmas
He found an old skipping rope
They heard the tui in the bush
We picked some daisies
She planted some seeds
The sun came out today
Class ran later than usual
It was time to get up
The old woman nodded
His shoes were all muddy
She dug up some potatoes
Someone’s knocking at the door
The young girl ran down the road
She waved from the doorway
They’re going to the movies
The cheese is in the fridge
The baker gets up early
She threw the stick to the dog
The weka stole the bread
My sister broke her arm
She hid the money
We followed the track
The biscuits are in the oven
They pushed off from the pier
The front door creaks in the wind
She threw the fruit in the bin
The girl put the toys away
The carpenter arrived
She has two older brothers
The computer is broken
Dogs like company
He seems really nice
The newspaper blew away
The puppy sleeps on the bed
A plane just flew over
It’s busy at the airport
The hot soup burned her tongue
You’re not supposed to be here
She’s too little for swimming
We don’t have much time
She cut up the broccoli
The new teacher looks nervous
They listened to the news
Her handbag was heavy
The cupboard was dusty
They cooked pikelets for tea
She tripped on the carpet
The shop was empty
The train woke her up
She looked down the hill
They recorded her height
They packed up the tent
Something hit me in the eye
Sheets hang on the washing line
They drove inside the gate
It didn’t surprise me at all
We’ve both got the same shoes
We had been awake for hours
Mum was yawning and nodding
The girl was out of breath
She wore a green necklace
The belt was too tight
The washing machine was empty
They looked for the car keys
She bought three coffees
The student picked up her pens
The garden was ruined
The man got very annoyed
Her nose was sunburnt and peeling
The police want to talk to him
The mirror faced the window
They went down to the pub
He looked back at the house
She jumped onto the horse
There’s a hole in the pocket
The shop sells fruit and vegies
The bus is on time for once
Mum dropped us off in town
Her grand-daughter is tiny
| 79 | They ate the apple crumble                      | 330 | She saw a famous actor                   |
| 80 | The kitchen clock was fast                     | 331 | The ring shone on her finger             |
| 81 | She crossed the car park                       | 332 | No one saw him creep past                |
| 82 | We like milk in our tea                        | 333 | The bike was lying in a bush             |
| 83 | We talked all night                            | 334 | She dragged the carpet outside          |
| 84 | They had lots of homework                      | 335 | The pot sat on the stove                 |
| 85 | The shopping bags were heavy                   | 336 | The sun shone through the leaves         |
| 86 | Our friend stayed for tea                      | 337 | The questions were easy                 |
| 87 | Our cat is very old                            | 338 | The restaurant was busy                 |
| 88 | Mum bought a new summer dress                  | 339 | The song had lots of verses             |
| 89 | The children called out to us                  | 340 | The afternoon was wet                   |
| 90 | The cat curled up on the bed                   | 341 | They picked lemons from the tree        |
| 91 | The wind blew the mist away                    | 342 | Names are hard to remember             |
| 92 | The bottle fell on the floor                   | 343 | The tomato sauce was red                |
| 93 | They slept in the old hut                      | 344 | He stopped on the doorstep              |
| 94 | The tall man frowned slightly                  | 345 | She painted the landscape               |
| 95 | We’re going on holiday                         | 346 | The driver wore a white shirt           |
| 96 | The dog caught the possum                      | 347 | The little kids were in one corner      |
| 97 | The cat waved its tail                         | 348 | Dinner was ready at six                 |
| 98 | The woman rode her bike                        | 349 | They had a great time last night        |
| 99 | She cooked some apples                         | 350 | We passed round cups of tea             |
| 100| The kitchen was full of smoke                  | 351 | She heard the truck passing             |
| 101| He soon got tired of watching                  | 352 | She talked about her journey            |
| 102| The cold air stung his face                    | 353 | Guests sleep in the front room          |
| 103| He ate a ham sandwich                          | 354 | There’s only one bathroom               |
| 104| The mattress lay on the floor                  | 355 | They didn’t argue any more              |
| 105| You’ll be tired after the trip                  | 356 | His wife sent him a letter              |
| 106| She was wide awake                             | 357 | The washing dried fast in the wind      |
| 107| Mum called us for breakfast                    | 358 | The photo was faded                     |
| 108| It was still very dark                         | 359 | We played cards on the deck             |
| 109| There were two old men there                   | 360 | He stood in the corridor                |
| 110| My sister picked some plums                    | 361 | Those two go to high school             |
| 111| He handed me the present                       | 362 | They shifted the chairs next door       |
| 112| They walked towards the ocean                  | 363 | We cleared away the dishes              |
| 113| She took a deep breath                         | 364 | The girls were doing handstands         |
| 114| She dropped the last peach                     | 365 | They cleared a patch of ground          |
| 115| We stayed and watched them work                | 366 | They waited in the kitchen              |
| 116| They left without warning                      | 367 | The team wore a uniform                |
| 117| No one knows the way                           | 368 | We left the beach behind               |
| 118| The red car passed the bus                     | 369 | The woman stopped talking              |
| 119| He’s missing his friends                       | 370 | We could stay at the hut               |
| 120| He carried a silver tray                       | 371 | We took Mum shopping                   |
| 121| A book case crashed down                       | 372 | We ate marmite on toast                |
| 122| We took the long way home                      | 373 | You’ve been away too long              |
| 123| Our old wooden house was small                 | 374 | The school’s closed today              |
| 124| The sun was getting hotter                     | 375 | You can’t use this road                |
| 125| The cleaner swept the floor                    | 376 | We took three bottles with us           |
| 126| The girls stood to one side                    | 377 | Mum might change her mind              |
| 127| We had to empty our plates                    | 378 | It’s better to wait a while            |
| 128| She’s finishing her drink                      | 379 | We talked on the phone all night       |
| 129| He doesn’t smile much                          | 380 | We’re learning to swim                 |
| 130| The children walked to school                  | 381 | She searched for her glasses            |
| 131| She started her homework                      | 382 | They knew we were there                |
They searched for the bag
The farmer cleaned his shoes
He's walking down to the shop
They ran back and forth
The smoke made him cough
Something landed in his lap
She'll get wet if she slips
She's going to catch him
You'll miss the show
The news came yesterday
The children stamped their feet
She climbed out of the hay
They had a lovely day
The knife cut the string
The bush rang with birdsong
She brushed the insects away
A seagull flew overhead
She stared across the garden
Granddad made him work hard
The grass is still damp
It's eating all the food
We can't pay our bill this month
The woman fell heavily
The doctor has a big bag
We don't know what to do
The clothes hang in the wardrobe
The breeze moved the curtains
The soldiers got off the train
The old man counted his coins
He found work on a boat
The boy drew a picture
She walked to the bus stop
She slipped on the path
The runner turned the corner
The guitar is out of tune
The fence was newly painted
He was too clever for them
He took off his hat
They chased the other children
She hurt her shoulder
She has to do the milking
The apples had black spots
The water is in the teapot
He wore his new pyjamas
The truck made a loud noise
There was no room for him
We hid behind the couch
She missed two days of school
The drive didn’t take long
The dogs were in the paddock
They climbed the steep mountain
He kept the old lady talking
Sunshine came through the window
The plumber fixed the tap
She walked straight outside
His idea didn’t work
We wouldn’t change a thing
There was rubbish everywhere
He didn’t mind at all
Icecream can hurt your teeth
They went to see the movie
The little boy sat quietly
The toy box was empty
An artist lives upstairs
The dentist called them in
She drank a glass of milk
They saw a rainbow
He sat next to the heater
We’re going on a trip
She nearly missed the plane
The man goes to work early
They stopped halfway up
The new girl had soft brown eyes
This horse can do tricks
The earth was stony
Cats don’t eat lettuce
The salad was on the table
He was lying on his side
They put him in the paddock
There’s no shelter anywhere
It’s cold on the hills
We’ll build him a stable
They caught up with their friend
The fish went into the fridge
We talked about the storm
It was a sack of mussels
She made a sling for his arm
He made two phone calls
He’ll be away by lunchtime
The driver gave us a ride
They worked out the answer
Lambs are born in the spring
They took sandwiches for lunch
He’s out milking the cows
The fruit trees are in flower
Let’s get some fish and chips
The woman smiled at him
They threw stones in the pond
No one answered the door
The man turned off the tap
He’s not supposed to be here
They won’t be hard to find
We should have cleaned it up
My sister did the dishes
We have to find a boat
These people are very nice
The waves lifted the boat
She pointed to the house
She could see the whales
People hurried down to the sea
The ferns were bright green
The rocks cut her feet
She had a handful of stones
They knew the place very well
After lunch they went walking
They washed their hands in the stream
She was allowed into the room
She had a handful of stones
They knew the place very well
There's a bridge further up
No one had come after them
They hadn't got coats
The hot concrete burned his feet
His parents were in town
The chair was painted pink
The rope stayed out of reach
He turned up his collar
The duck stole a piece of bread
We'll do it while she's out
Put your hands over your eyes
The soap bubbles burst
They wheeled in their bikes
She likes the blue pencil case
All the windows are closed
She made lots of jam
The boy carried a big pack
She bought a ticket
They fed the ducks at the park
The beetle hid in the ground
The bruise was purple
They ran through the night
They needed a holiday
They were pleased with the catch
The bird made a nest
The hen sat on the eggs
They waited a day or two
The cat was under the house
They drank milo at bedtime
We can't get the books today
The lid fit very tightly
She put on the white socks
The nurse was a kind woman
The shelter was open on Sundays
He told a funny joke
The shop's open on Sundays
She liked the blue pencil case
All the windows are closed
The duck stole a piece of bread
We'll do it while she's out
Put your hands over your eyes
The soap bubbles burst
They wheeled in their bikes
She likes the blue pencil case
All the windows are closed
She made lots of jam
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The nurse was a kind woman

<table>
<thead>
<tr>
<th>Line</th>
<th>Sentence</th>
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<tbody>
<tr>
<td>239</td>
<td>The volcano roared</td>
</tr>
<tr>
<td>240</td>
<td>The woman raised her voice</td>
</tr>
<tr>
<td>241</td>
<td>The washing dried in the sun</td>
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<td>242</td>
<td>The glass smashed on the floor</td>
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<tr>
<td>243</td>
<td>We could get a drink</td>
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<td>244</td>
<td>They shared out the food</td>
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<tr>
<td>245</td>
<td>The hens scratched in the dirt</td>
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<tr>
<td>246</td>
<td>They found the girl inside</td>
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<td>247</td>
<td>He crawled into a corner</td>
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<td>248</td>
<td>We’re staying with a friend</td>
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<td>249</td>
<td>She was asleep on the couch</td>
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<td>250</td>
<td>He was asked to speak</td>
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<td>251</td>
<td>They wanted to help out</td>
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<td>490</td>
<td>She stepped onto the porch</td>
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<tr>
<td>491</td>
<td>He lived in a white cottage</td>
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<tr>
<td>492</td>
<td>The seagulls flew over the waves</td>
</tr>
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<td>493</td>
<td>The dog came out of the kennel</td>
</tr>
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<td>494</td>
<td>She got out of her school clothes</td>
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<td>495</td>
<td>She never went outside</td>
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<tr>
<td>496</td>
<td>The sheep ate the grass</td>
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<td>497</td>
<td>They brought in the firewood</td>
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<tr>
<td>498</td>
<td>Her brother was the shortest</td>
</tr>
<tr>
<td>499</td>
<td>He headed further downstream</td>
</tr>
<tr>
<td>500</td>
<td>They held onto the rope</td>
</tr>
<tr>
<td>501</td>
<td>They watched the news on tv</td>
</tr>
<tr>
<td>502</td>
<td>There was just one problem</td>
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</tbody>
</table>
The Effectiveness of Conversation Training for General Practitioners when Consulting with a Person with Aphasia: A Single Case Pilot Study

Kristy O’Connor¹
Clare McCann, PhD²

¹ Middlemore Hospital, Counties Manukau District Health Board, Auckland
² Speech Science, Department of Psychology, The University of Auckland, New Zealand.

Recent studies have shown that conversation training can aid communication for adults with aphasia. This study aimed to investigate the effectiveness of a conversation training course delivered to a General Practitioner (GP) in New Zealand in order to determine whether a trained GP could facilitate participation and increase communication access within a simulated GP consultation. A single case pilot study was used with the GP taking part in a pre-training simulated GP consultation (with a person with aphasia) followed by a modified Supported Conversation for Adults with Aphasia (SCA) conversation course. This was followed by a post-training simulated GP consultation (with a person with aphasia). The qualitative data obtained from the pre- and post-training consultations were analysed and compared using conversational performance measures, and a post-training questionnaire was completed by the GP. The results of the study provide support for the effectiveness of conversation training for a GP when consulting with a person with aphasia. Following training the GP increased the use of facilitative communication strategies to provide information to the person with aphasia and ascertain her medical concern. This, in turn, resulted in an increase in the person with aphasia’s participation in the consultation. The results provide motivation for increasing communication access and participation during GP consultations to a larger aphasia community. Incorporation of conversation training into NZ’s GP continuing medical education (CME) or medical curriculum could facilitate communication access and participation nationwide.

Recent trends in aphasia intervention have been influenced by the social model of rehabilitation which focuses on facilitating participation for a person with aphasia (PWA) in genuine adult interaction (Pound, Parr, Lindsay, & Woolf, 2000). In particular, interaction at conversation level has been of interest over the past decade (Kagan, 1995, 1998; Legg, Young, & Bryer, 2005; Parr & Byng, 1998; Pound et al., 2000; Rayner & Marshall, 2003; Simmons-Mackie & Kagan, 2007; Turner & Whitworth, 2006). With reference to the International Classification of Functioning, Disability and Health (ICF) conceptual framework (WHO, 2001), a PWA may find conversation difficult because the activity of expressing thoughts and ideas is limited (Simmons-Mackie & Kagan, 2007).

Qualitative research has identified barriers and facilitators that impact on the lives of PWA (Brown et al., 2006; Howe, Worrall, & Hickson, 2007), thereby affecting their quality of life (Hilari, Wiggins, Roy, Byng, & Smith, 2003). A major barrier identified was limited awareness and knowledge about aphasia in the general public and industry service workers, for example health care workers. Factors associated with limited awareness and knowledge that hinder communication included time availability, complexity of language employed and availability of extra communication support (Howe et al., 2007; Pound & Hewitt, 2004). These factors impact on a PWA contributing to and participating in social conversational tasks (Howe et al., 2007). In a health care setting,
lack of awareness and knowledge of aphasia can result in a patient having reduced ability to make decisions, and restricted participation in decision making processes (Simmons-Mackie et al., 2007).

Education and training programmes aimed at increasing public awareness of aphasia have been developed, in both the general public and/or specific service and occupational groups (Kagan, 1995, 1998; Simmons-Mackie & Kagan, 1999). This has proven effective in creating opportunities and assisting participation in conversations. Education can change public perceptions and attitudes about aphasia and improve quality of life as PWA are shown respect during social interactions, thus reducing social exclusion on a larger societal scale (Parr, 2007).

**Supported Conversation for Adults with Aphasia (SCA)**

Supported Conversation for Adults with Aphasia (SCA) is an example of a conversation-based intervention approach (Kagan, 1998). SCA can reduce conversational activity limitation and participation restrictions by explicitly teaching conversation partners how to reveal the inherent competence of a PWA using specific facilitative strategies (Kagan, 1995). SCA training also reduces environmental barriers in order to increase communication access (Kagan, 1998; Kagan & LeBlanc, 2002; Simmons-Mackie, 1998). Communication access within differing conversational environments can facilitate the PWA becoming an effective communicator by using alternate means of expression, such as total communication strategies. Training conversation partners with the understanding and use of these alternate means of communication can therefore increase participation in conversation (Kagan, 1998). SCA is conceptualised by conversation occurring in partnership (Kagan, 1998). The SCA training course involves a one day workshop that covers the following areas; aphasia education and awareness, technical application through role play of conversational techniques including ‘acknowledge competence’ and ‘reveal competence’ of a PWA, role play and evaluation exercises. ‘Acknowledging competence’ creates a feeling of autonomy for the PWA during conversation. This is achieved by outwardly expressing and acknowledging the PWA’s difficulty in expressing themselves verbally as well as accepting their alternate and nonstandard methods of communication in order to maintain a genuine adult interaction (Kagan, 1998). ‘Revealing competence’ refers to the skills of the conversation partner in aiding conversation. This is achieved by employing nonstandard methods of communication, for example, writing or resource materials, in order to increase comprehension and provide a means of response for the PWA (Kagan, 1998).

The efficacy of SCA training was evaluated in a randomised controlled trial by Kagan, Black, Duchan, Simmons-Mackie, and Square, (2001) using volunteer communication partners. Two new performance measures were developed to evaluate efficacy. These were the “Measure of Skill in Providing Supported Conversation for Adults with Aphasia” [(M)SCA] and the “Measure of Participation in Conversation for Adults with Aphasia” [(M)PCA]. The (M)SCA measured the conversation partner’s ability to Acknowledge and Reveal Competence in the PWA. The (M)PCA reflected the PWA's ability to partake in an interaction. This included participation through a social connection to the conversational partner as well as the information exchange during the conversational transaction (Kagan et al., 2001; Kagan et al., 2004). Statistically significant differences were found in the performance scores between trained and untrained volunteers, thus providing efficacy for SCA training in the improvement of communication skills for volunteers when communicating with a PWA (Kagan et al., 2001).

**Increasing Communication Access in a Health Care Setting**

Similar to Kagan et al. (2001), Legg et al. (2005) conducted a randomised controlled trial of SCA training to sixth year medical students in South Africa. They evaluated the effectiveness of training while the medical students were obtaining a case history from an adult with aphasia. Results showed students who received SCA training significantly improved their ability to obtain a case history with the patient, while the control group displayed no improvement after receiving only information about aphasia that was consistent with their medical curriculum (Legg et al., 2005). These results provide support for the introduction of a conversation training
course in a medical curriculum to explicitly teach facilitative communication strategies.

Communication has long been identified by health professionals as an important aspect of a successful service (Dacre, Richardson, Noble, Stephens, & Parker, 2004; Roter & Hall, 1993). Dacre et al., (2004) demonstrated the effectiveness of providing a generic communication skill training course to postgraduate medical professionals for communicating with general patients (excluding those with communication disabilities). In combination with Legg et al., (2005) these results indicate the need for health care professionals to receive conversation training to ensure effective communication when working with PWA.

Simmons-Mackie et al., (2007) investigated improvements in PWA’s access to information and decision making processes within healthcare services following a training intervention entitled ‘Communicate Access Improvement Project’ (CAIP). Results collected by observation and interviews showed healthcare professionals increased their knowledge about facilitating communication access. There was a noticeable increase in the social inclusion of patients with aphasia within acute care, rehabilitation and long term care health care systems. The CAIP programme individualised training to the healthcare setting by using specific examples to aid generalisation of training. A major clinical implication from the study is that sustainable changes can be achieved within a healthcare service (Simmons-Mackie et al., 2007).

Given the effectiveness of these conversation-based training programmes, we were keen to evaluate the impact of a similar programme in the New Zealand healthcare setting. We targeted a General Practitioner (GP) who has reason to use effective conversation skills in her practice. Using a modified SCA training course we hypothesised that the GP’s communication skills would improve in a simulated consultation with a person with aphasia (PWA). We further predicted that the conversational participation of the PWA would increase during the simulated consultation after the GP had received training.

**METHOD**

**Participant**

The sole participant of this study was a female GP. In addition, a PWA assisted in the planning and execution of the simulated GP consultations. The GP was recruited through a professional network for GP practices in a large geographical area in NZ. This network is a registered provider of continuing medical education (CME). The GP volunteered to participate after receiving an outline of the study that described the communication skills training course as an opportunity to upskill in communicating with patients with acquired neurogenic communication disorders. To reduce the possibility of bias the terms ‘aphasia’ and ‘SCA’ were not mentioned in the outline of the study. At the time the study was conducted the GP was working in the community and her caseload included a single patient with severe nonfluent aphasia as well as some patients with a traumatic brain injury (TBI). The GP qualified in medicine in 1994 and began working as a GP in 1997. She combined her part-time practice with having a young family and was actively engaged in CME. She was very enthusiastic about the use of supported communication and its benefits to her practice. The PWA was a 59-year old woman who was diagnosed with moderate-severe nonfluent aphasia (AQ = 51) following a left hemisphere MCA infarct in 1998 (11 years prior to the study). Prior to commencement of the study, ethical approval was obtained from the local research ethics committee.

**Procedure**

The training course was based on Kagan’s model (Kagan, 1998; Kagan et al., 2001) with a focus on supported conversation and increasing communication access. This study was a single case A1BA2 design. A1 was a pre-training simulated consultation, B was a 1½-hour training course and A2 was a post-training simulated consultation. To evaluate the effectiveness of the training course the GP was video and audio recorded performing two simulated GP consultations with the person with aphasia. The simulated consultations occurred immediately before and six days after the training course.
A.: Pre-training Simulated GP Consultation

The GP and PWA were formally introduced and given 10 minutes for initial rapport building prior to the commencement of the pre-training simulated GP consultation. This was to ensure the GP had the same level of familiarity with the patient in both pre and post-simulated GP consultations so any improvements could not be attributed merely to increased familiarity.

GP Instructions

The following information was given to the GP before the pre and post-training consultations. She was to conduct a 10-minute consultation with the PWA who had a medical scenario to portray. The GP was reminded that the focus of evaluation was effective communication and how medical content was conveyed, rather than the medical content itself. During the pre and post-training consultations the GP was provided with pen and paper.

PWA Instructions

The PWA was instructed to convey and seek treatment information for a pre-rehearsed medical scenario. She was instructed to communicate naturally by employing her own facilitative strategies when needed, to communicate her medical concern e.g. gesture and facial expression. However, she was advised not to use writing as an expressive language output unless this was facilitated by the GP with the provision of a pen and paper.

Scenario

In collaboration with the PWA the following scenario was decided on for the simulated GP consultation: “You have a headache with concerns of having another stroke”. The following information was also discussed with the PWA before the pre-training GP consultation for her to practise the facts of the medical condition she was portraying.

1. You are going to the GP because you think you are having another stroke
2. You have a bad headache and think it is more than just a migraine
3. You are really scared and worried
4. You have had the pain for a few days
5. Your head hurts all over.

B: Communication Skills Training

The training course had a focus of increasing knowledge and skill of the GP in revealing and acknowledging the competence of a PWA with moderate to severe aphasia. The course comprised an intensive one-to-one informal tutorial between the researcher and the GP. The researcher invited discussion and questions from the GP and a handout was provided with important facts, strategies and key references for further reading. The training course contents were delivered in 1.5 hours and were modelled on Kagan, (1998) and Kagan et al.’s (2001) SCA instructional protocol but condensed into the three sections outlined below:

1. A 10-minute brief introduction to aphasia involving an open discussion with the GP where she described her past experience with patients with aphasia and her understanding of the varying presentations of aphasia across patients. Unlike other training courses (Kagan, 1998; Legg et al., 2005; Rayner & Marshall, 2003) emphasis was not placed on the neurogenic causes of aphasia and the presenting characteristics of a patient with aphasia as this was assumed medical knowledge.

2. The 26-minute Aphasia Centre instructional video (Kagan, Winckel, & Schumway, 1996) was used to introduce the concept of communication access and masked competence. The video also illustrated techniques for acknowledging and revealing competence with a real life demonstration of supported conversation as well as acted scenarios.

3. Discussion about the three founding concepts of SCA; 1) skill and experience of the PWA, 2) skill and experience of the conversation partner, and 3) availability of resources, in particular the Aphasia Institute ‘Talking to your Doctor’ interactive resource for PWA when communicating with a medical professional (Kagan & Schumway, 2003). Techniques and strategies for acknowledging and revealing competence introduced in the video were honed through further discussion and supported with evidence of their effectiveness from the literature.
**A2: Post-Training Simulated GP Consultation**

The GP and PWA were given the same verbal instructions stated in A1.

**Scenario**

In collaboration with the PWA the following scenario was decided on for the post-training simulated GP consultation: “You have heartburn with concerns of having a heart attack”. The following information was discussed with the PWA before the post-training GP consultation for her to practise the facts of the medical condition she was portraying.

- a You are going to the GP because you have heartburn
- b You think it might be a heart attack and are really concerned
- c You have had the pain for a few days
- d The pain comes and goes but it gets worse at night
- e You have only taken pain killers for the pain

The Aphasia Institute ‘Talking to your Doctor’ interactive resource for people with aphasia was made available to the PWA (Kagan & Schumway, 2003) during this consultation.

**Performance Measures**

Three measures were used in this study:

1. **The Measure of Skill in providing Supported Conversation for Adults with Aphasia (M)SCA** (Kagan et al., 2001) qualitatively measured a change in GP behaviour by attributing a performance score for demonstrated supported communication skills between the pre and post-training GP consultations. Behaviours include acknowledging and revealing the competence of the PWA. Acknowledging competence is related to how the PWA is treated. It is demonstrated by maintaining natural adult conversation that is appropriate to the context, and taking on the communicative burden wherever necessary to ensure the comfort of the PWA. Revealing competence is related to behaviours that help the PWA to reveal what he or she knows, thinks or feels. It is demonstrated by presenting information in multiple modalities including verbal, aided by gesture and/or writing. This is calculated by averaging the scores of the following three behaviours; ensuring the PWA comprehends, ensuring the PWA has a means of responding and verification of the PWA’s response.

2. **The Measure of Participation in Conversation for Adult with Aphasia (M) PCA** (Kagan et al., 2001) qualitatively measured a change in the behaviour in the PWA by attributing a performance score for demonstrated level of participation between the pre and post-training GP consultations. Behaviours include interaction and transaction. Interaction has been described (by Kagan et al., 2001) as “social connection” and involves sharing the responsibility of initiating and maintaining interaction and maintaining the feel and flow of a genuine adult interaction. The measure of interaction focuses on the social variables of the consultation that facilitate participation rather than the transfer of information (transaction) that occurred during the following interactional samples. Transaction, on the other hand, is the exchange of content (information, opinions or feelings). This is achieved by introducing a new topic or referring back to a previous topic, spontaneously using facilitative strategies or using the support offered by the GP.

3. **A post-training questionnaire** consisting of three questions was completed electronically by the GP two days after the second simulated GP consultation. This was to retrospectively ascertain her self-reported ability to effectively communicate with the PWA pre and post-training. This also provided an opportunity for her to express her opinion of the value of an SCA training course as part of her ongoing career. See Appendix 1 for the questionnaire.
The (M)SCA and (M)PCA are intended to rate adults with moderate to severe aphasia when talking to any conversation partner (Kagan et al., 2001). Rating was done by the researcher and checked for inter-rater reliability by two naive raters (who received one hour of education about (M)SCA and (M)PCA using Kagan et al.’s, 2001 descriptive breakdown of observable behaviour changes). Ratings were done using a 9-point scale, ranging from 0–4 with 0.5 intervals.

RESULTS

The pre-training simulated GP consultation scores were compared to post-training scores for both the (M)SCA and (M)PCA. These are presented in Tables 1 and 2. The differences reveal an increase in (M)SCA and (M)PCA scores post-training. The increase in scores demonstrates a quantitative change in behaviour made by the GP and/or the PWA during the consultation. A score of ‘4’ is the highest obtainable score for the (M)SCA and (M)PCA. A high score for (M)SCA and (M)PCA behaviours reflected performance outcome as a whole, rather than an observed increase in the quantity of the behaviours.

Interactional Samples

The (M)SCA and (M)PCA behaviours are illustrated in turn below using actual samples from the pre- and post-training simulated GP consultations. These samples illustrate changes in the behaviour of the GP and the PWA across the two consultations. The samples do not reflect ‘poor’ vs. ‘good’ behaviour. Instead a qualitative description is provided to explain increases in the post-training performance scores, and how this reflected the execution of each behaviour.

A. Measure of Skill in providing Supported Conversation for Adults with Aphasia (M)SCA

1. Acknowledge Competence

The GP acknowledged the inherent competence of the PWA in both the pre- and post-training simulated GP consultations, but her performance score increased from 2.5 pre-training to 4 post-training.

Table 1. Pre and post-training (M)SCA performance scores using a 9-point scale, ranging from 0–4 with 0.5 intervals.

<table>
<thead>
<tr>
<th>(M)SCA Behaviour</th>
<th>Pre-training Performance Score</th>
<th>Post-training Performance Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Acknowledge Competence</td>
<td>2.5</td>
<td>4</td>
</tr>
<tr>
<td>2. Reveals Competence*</td>
<td>1.8</td>
<td>3.5</td>
</tr>
<tr>
<td>a) Ensuring comprehension</td>
<td>2.5</td>
<td>3.5</td>
</tr>
<tr>
<td>b) Ensuring a means of response</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>c) Verification</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

* Reveals Competence is calculated by averaging a), b) and c)

Table 2. Pre and post-training (M)PCA performance score using a 9-point scale, ranging from 0–4 with 0.5 intervals.

<table>
<thead>
<tr>
<th>(M)PCA Behaviour</th>
<th>Pre-training Performance Score</th>
<th>Post-training Performance Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Interaction</td>
<td>2.5</td>
<td>4</td>
</tr>
<tr>
<td>2. Transaction</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

*Numbers refer to reference line on the original transcript. ** Brackets denote actions
Sample from pre-training simulated GP consultation:

#4* PWA Please help um Tim holiday yeah
#5 GP Tim holiday?
#6 PWA Ah T Tim um /ho/ holiday /holanIn/, now here
#7 GP Okay, now I’m sorry I’m not understanding very well we will take it slowly so I know exactly what is going on
#8 PWA [Patient nods head]**

This sample demonstrates the GP being sensitive to the PWA’s unclear conversational turn on line #4. The GP takes on the communicative burden by claiming responsibility for the breakdown and lack of understanding. This demonstrated to the PWA that the GP understood the aphasia was masking her inherent competence. This in turn allowed the PWA to feel comfortable within the consultation.

Sample from post-training simulated GP consultation:

#117 GP Okay okay what we need to do (patient’s name) is run some tests. We need to...
#118 PWA Ahh yes
#119 GP We need to do an ECG where we put little electrodes [GP gestures electrode placement on her body] on your chest and on your arms and legs and we do a trace of your heart, to see if you are getting any heart damage
#120 PWA [Patient points to key word ‘angina’]
#121 GP The ECG won’t tell us if its angina but will tell us if you’ve had quite significant heart damage, if you’ve had a heart attack alright.
#122 PWA [Patient nods]

This sample shows the GP and PWA engaged in a medical discussion, in which the GP provided detailed verbal and gestural information. For the PWA’s conversational turn on line #120 she pointed to a previously introduced written key word. The GP interpreted her response as a question and responded accordingly without verifying the meaning of her pointing. This maintained a natural conversational flow so the consultation appeared as a genuine adult interaction appropriate to the context of the consultation. The PWA’s competence was further acknowledged by the GP as she accepted the nonstandard form of communication (pointing) as a suitable contribution to the interaction. Overall, the natural conversational flow facilitated the PWA to receive information she needed about the benefits of ECG before making an informed decision about the procedure.

2. Reveal Competence

a) Ensuring comprehension. There was an increase in ensuring the PWA’s comprehension from 2.5 pre-training to 3.5 post-training. The following demonstrated the GP’s skill at ensuring the PWA could comprehend her conversational turn. The key difference between the pre-training and post-training was the use of successful gesture.

Sample from pre-training simulated GP consultation:

#44 GP Okay, okay, I understand, very frightening for you. Do you, does this headache come and go or is it there all the time?
#45 PWA Um ah (9 sec) no no
#46 GP It’s its constant? [GP makes hand gesture showing time passing]
#47 PWA Now now
#48 GP Now okay

The above sample begins with the GP asking the PWA a two part question. It takes her 9 seconds to produce an answer which was incorrect and unclear to the GP. Line #46 shows the GP rephrase her original question to require a simpler yes/no response. She attempted to gesture her question to further ensure the PWA’s comprehension, but this was unsuccessful.
Sample from post-training simulated GP consultation:

#133 GP  
(... what we might do is arrange to find out why you are getting this [GP gestures heart pain] whether it’s coming from your stomach [GP gestures stomach area] because a lot of people who get chest pain, it’s not anything to do with their heart [GP gestures heart pain]

#134 PWA  
[Patient shrugs shoulders and gestures ‘why?’]

#135 GP  
More often than not it’s actually to do with your stomach and acid coming up into your oesophagus [GP gestures the movement of acid reflux] So that could be the reason. Fingers crossed that is because we could treat that one very easily. [GP crosses fingers]

#136 PWA  
Yip yip

Here the GP employed facilitative strategies to ensure the PWA had a means of comprehending. This involved formulating short phrases and combining this with gesture. By breaking down the gestures into a logical flow (lines #133 and #135 below), the GP is demonstrating her ability to maximise the PWA’s comprehension of a complex medical discussion.

b) Ensuring a means of response. The GP displayed facilitative strategies to ensure the PWA had a means of responding in both the pre and post-training simulated GP consultations. Sample from pre-training simulated GP consultation:

#82 GP  
... do you have a list of medications you are on at the moment?

#83 PWA  
Yes. Ah umm um ah Tim [Patient gestures writing] umm /ep/ [Patient shows GP medical alert bracelet]

#84 GP  
The epilepsy medication

#86 PWA  
Yip, an /a/, /a/  

#87 GP  
Asprin?

#88 PWA  
No yes yeah one an /m/ /mU// mUn/ no (laughs)

#89 GP  
These drugs names are very difficult aren’t they perhaps you could write, perhaps you could spell it for me that would be easy. [GP provides patient with pen and paper]

#90 PWA  
Yes [writes down response]

This pre-training sample shows the GP attempting to reveal the competence of the PWA. It begins with the GP asking the PWA a yes/no question. She responds but also signals through gesture and vocalisations that she has extra information to provide. Initially, she gestured that she wanted to write her response but this seems to go unnoticed by the GP until line #89. She tries again by showing the GP her medical alert bracelet that contained information she wanted to convey. On line #89 the GP facilitated her response by providing a pen and paper for her to write the word having struggled to produce the name verbally.

Sample from post-training simulated GP consultation:

#85 GP  
Have you any brothers and sisters?

#86 PWA  
Umm [Patient begins to gesture number on hand]

#87 GP  
Do you have a brother? [GP writes down key word question ‘brother?’]

#88 PWA  
Ah two

#89 GP  
two [GP writes down number 2 next to key word ‘brother’]

#90 PWA  
And sister

#91 GP  
Okay [GP writes down key word ‘sister’]

Here we see the GP employing two facilitative strategies to ensure the PWA had an easy means of responding. It begins with the GP asking a two part question which the PWA struggles to answer succinctly. Line #87 shows the GP reposing her question to enable a simpler yes/no response as well as representing the question with a written key word. Line #88 shows the PWA providing a verbal answer to the simplified question as well as providing additional information in keeping with the topic of the original question. By verbally
simplifying and writing key words the PWA was able to answer verbally with one or two word responses. This sample appeared as a natural two-way flow of information between the GP and PWA despite her limited verbal output.

c) Verification. Verification strategies were employed by the GP to establish accuracy of the PWA’s response. There was an increase in the amount and skill of the GP’s verification techniques during the post-training consultation from 1 pre-training to 3 post-training.

Sample from pre-training simulated GP consultation:

#29 PWA  Nope I hurt head /æk/  
[Patient gestures pain in her head at the front left]

#30 GP  Headache?

#31 PWA  Yeah hum

#32 GP  Okay, how long have you had the head ache?

#33 PWA  I think um one um week

#34 GP  One week

#35 PWA  Yeah

#37 GP  And it’s at the front of your head on the left side /GP gestures pain in head at the front left side/

The pre-training sample shows the GP using a facilitative verification strategy. On line #34 she reflects on the information received and restates it back to the PWA and additionally mirrors the gesture produced by her on line #29. This sample was the only example of a facilitative verification strategy employed during the pre-training consultation. Throughout this consultation the GP clarified unclear responses using only verbal verification as seen in line #34.

Sample from post-training simulated GP consultation:

#103 GP  Have you ever had a problem with cholesterol?

#104 PWA  Oh I don’t hmmm one umm ahhh

#105 GP  I know you know

#106 PWA  I think one one

#107 GP  Once, so you’ve had a blood test?

#108 PWA  Good, good yeah /ɔd/ /ɔd/ /ɔd/ /ɔd/  
[Patient gestures with her arms]

#109 GP  A long time ago?

#110 PWA  Yeah

#111 GP  A long time ago you had a blood test and it was a good blood test [GP gestures thumbs up]

#112 PWA  Yes

The post-training sample shows the GP and PWA discussing a topic with several lines of dialogue. On line #111 the GP combines the information received and restates it back to the PWA with the additional use of gesture, which further demonstrated to the PWA that her message had been understood.

B. The Measure of Participation in Conversation for Adults with Aphasia (M)PCA

1. Interaction

There was an increase in the interactional performance score from 2.5 pre-training to 4 post-training. This was a reflection of the overall increase in the PWA’s participation as a result of the interactional behaviours employed.

Sample from pre-training simulated GP consultation:

#72 GP  Do you normally live alone?

#73 PWA  Yes, yeah yeah yeah
[Patient shows the St John alarm around her neck]

#74 GP  You’ve got a St John alarm

#75 PWA  Yes

#76 GP  Good

#77 PWA  Good

#78 GP  Fantastic, and are you supported at home? Do you have family or friends?

#79 PWA  Friend two friend  
[Patient displays two fingers and then gestures talking on phone]  
/æk/ any

The PWA participates in the above sample by spontaneously employing facilitative strategies to answer the GP’s questions, for example, displaying an item in line #73 and using gesture in line #79. These strategies help maintain a natural flow to the consultation and display the PWA’s social engagement.
**Sample from post-training simulated GP consultation:**

#53  GP  So any time of day it *(pain)* can come on. Is it related to eating?

#54  PWA  I don’t know? ah *[Patient flicks through ‘Talking to Doctor’ resource book and stops when on page with pictures related to eating related medical issues]*

#55  GP  Does it seem to be worse when you eat? *[GP points to pictures of eating related medical issue]*

#56  PWA  No *[Patient points to picture]* no *[Patient points to another picture]* no *[Patient points to another picture]* no *[Patient points to another picture]* ah or who /ha/ all an *[Patient points to picture of heart burn]* /hak/ an *[Patient begins to writes down word ‘heart attack’]*

#57  GP  Heart attack? *[GP reads response]*

The above sample shows the PWA using a range of facilitative strategies to be socially involved in the consultation while expressing her medical concern. Line #54 shows her spontaneously and appropriately consulting the resource picture book. The GP acknowledges this alternative form of communication and encourages her to continue by referring to the book herself. The PWA refers to a range of pictures while producing a verbal response. This process took time but allowed her to be socially involved in the consultation. The end result of the interaction flowed like a genuine adult conversation which was appropriate to the context of the consultation.

2. **Transaction**

The PWA demonstrated transaction by employing facilitative techniques to aid and maintain the exchange of information, opinions and feeling with the GP during both consultations. The PWA’s increase in performance score from 2 pre-training to 4 post-training was linked to the increase in (M)SCA behaviours employed by the trained GP.

**Sample from pre-training simulated GP consultation:**

#99  PWA  An no an no no no ah no

#100  GP  125/185 oh your blood pressure oh okay *[GP reads response]*

#101  PWA  Yip

#102  GP  Thank you very much

#103  PWA  Yes yes

#104  GP  So that’s what you normally are

#105  PWA  Yeah

This sample demonstrates the PWA initiating a transaction whereby she spontaneously used the facilitative strategy of writing to provide the GP with medical information which may be useful during the consultation.

**Sample from post-training simulated GP consultation:**

#91  GP  Has your sister ever had a heart attack or angina?

#92  PWA  No

#93  GP  None okay, or your brothers

#94  PWA  What I what what *[Patient starts to right down the word ‘angina’]*

#95  GP  What is angina?

#96  PWA  Yeah

#97  GP  Angina is the name we give to heart pain *[GP gestures heart pain]*

So if you have pain in your heart we called it angina. So the pain of a heart attack is called angina. It’s when heart muscle isn’t getting enough oxygen.

#98  PWA  Oh yeah

Line #94 demonstrates the PWA again employing the facilitative strategy of writing to seek clarification from the GP. This shows her active participation within the conversation as she is able to seek a transactional exchange of information.
Post-training Questionnaire

A questionnaire was administered to determine the GP’s perception of her communication during the pre and post-training simulated consultations. The term ‘effectiveness’ referred to; the amount of correct information received, comfort level felt during the consultation, use of facilitative strategies to aid communication, and the extent of competence revealed. Answers were rated on a 0–4 scale (0 indicating not effective and 4 very effective). Table 3 below shows the GP’s own scores of her perceived ability to effectively communicate with the PWA. As can be seen in Table 3, she perceived this to increase from a score of 3 pre-training to a score of 4 post-training.

DISCUSSION

This pilot study evaluated the effectiveness of a supported conversation training course for a GP when communicating with a PWA. At the outset of this study, it was hypothesized that a modified SCA training course would improve the GP’s communication skills as well as increase the PWA’s participation in the consultation. The results of this study provide support for these hypotheses and are in keeping with other similar studies (Kagan, 1998; Kagan et al., 2001; Legg et al., 2005; Rayner & Marshall, 2003). Improvements in the GP’s communication skills are related to the increased use of facilitative communication strategies that revealed and acknowledged the inherent competence of the PWA. This is comparable to Legg et al., (2005) who found an increased use of these strategies in SCA-trained medical students when conducting a case history with patients with aphasia. The traditional medical school education in aphasia is usually a description of the pathophysiology of aphasia and possible tips for a bedside examination, but nothing about how to communicate and interact with a PWA. Recent studies have attempted to address this in the training and evaluation of communication skills in medical students (Legg et al., 2005) and a postgraduate training course in communicating with patients for physicians (Dacre et al., 2004), though this did not specifically focus on the PWA. Legg et al., (2005) reported an overall interactional gain between sixth year medical students and PWA when establishing rapport and obtaining information. The current study took this concept further to achieve the reciprocal giving and receiving of information which is likely to occur in a GP consultation. Like Legg et al., (2005) our results showed an increase in overall interaction. Furthermore, we showed a successful relationship between supported conversation and an increase in transactional exchange of information in a medical setting. Following the training the PWA had increased communication access to the consultation, as demonstrated by her increased participation in the consultation. The GP’s use of learned facilitative communication strategies allowed the PWA to participate in medical discussion and decisions where an informed choice was necessary. Thus, the PWA had a means of understanding the GP’s medical information as well as a better means of responding. This was highlighted in the interactional samples where the PWA was seen asking questions about health care procedures.

Secondly, the GP’s use of facilitated communication strategies resulted in an increase in the transaction of information by the PWA. Simmons-Mackie, (1998) states that the use of facilitative communication strategies by a conversation partner can empower a PWA to use alternate forms of communication. The current study supported this claim as the PWA utilised the facilitative communication strategies introduced by the GP, for example, using gesture to describe her medical concern after this was modelled by the GP.

Simmons-Mackie & Kagan, (1999) found that ‘good’ conversation partners would sacrifice transactional goals (content exchange) in favour of interactional goals (social exchange). However, in a medical setting, such as a GP consultation, the focus of a patient’s participation

<table>
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<tr>
<th>Self rating of effectiveness</th>
<th>Pre-training</th>
<th>Post-training</th>
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<td></td>
<td>3</td>
<td>4</td>
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Table 3. The General Practitioner’s (GP) perceived effectiveness in communicating with the PWA during pre and post-training simulated GP consultations. (Range = 0-4)
is the transaction of their medical concern. The current study found that the transactional goals of the PWA were achieved by the GP revealing her competence. This was because she could depend on the support provided by the GP (e.g., writing material and ‘Talking to your Doctor’ resource book) for information exchange. Thankfully, this was not at the expense of her interactional goals. Instead, a genuine adult interaction was achieved through the GP acknowledging her competence allowing her to focus on transactional exchanges in an atmosphere that was socially appropriate to the context. Of particular note is the use of the ‘Talking to your Doctor’ resource book by the GP in the post-training consultation. It was queried why this was not made available in the pre-training consultation. The simple explanation is that this resource book formed the basis of the training. As one of the three founding concepts of SCA (availability of resources) the book was part of the GP’s newly-trained supported conversation techniques.

There were however, two limitations to the study. The initial intention was to recruit a group of GPs, but this proved difficult. Consequently, the communication skills training had to be modified. It did not include role play or the opportunity to practise the newly acquired facilitative strategies. This substantially reduced the length of the training, but as can be seen above, this still yielded positive results of the effectiveness of conversation training. Perhaps the reduced length of training may be more appealing to busy GPs practising in the community. An advantage of the single case study design is that the validity of the pre and post-training GP consultations was controlled. If this study were to be replicated with larger participant numbers the use of pre- and post-training scenarios should be randomised.

A second limitation was that we did not examine the generalisation of the facilitative communication strategies into the GP’s current practice. Instead, we were limited to the two specified points in time (the pre and post-training simulated GP consultations). It is assumed that there was some generalisation because, in the post-training questionnaire, the GP described ongoing benefits with other patients with communication disorders including aphasia. She also reported that the training course provided her with confidence and tools for communicating with patients with aphasia.

A possible consideration for future studies would be the inclusion of two baseline pre-training consultations in order to better address the issue of familiarity between the GP and PWA. Additionally, requiring the GP to complete the Participant Questionnaire both before and after the training may have added to the rigour of the findings.

The results of this pilot study provide support for the effectiveness of conversation training for a GP in NZ. These results add to the international body of evidence that conversation training can facilitate participation and increase communication access to health services for patients with aphasia. They also provide motivation for a nationwide systematic change in practice to increase communication access and participation for PWA during GP consultations. The GP reported in the post-training questionnaire that she believed the conversation training course would have been beneficial at the start of her medical career and “should be compulsory for all GP registrars and hospital doctors”. This suggestion could be achieved by incorporating conversation training into NZ’s GP continuing medical education (CME) or medical curriculum.

Contact Details
Please address correspondence to:
Dr Clare McCann
Department of Psychology (Speech Science)
Tamaki Campus
The University of Auckland
Private Bag 92019
Auckland, New Zealand
c.mccann@auckland.ac.nz
REFERENCES


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APPENDIX

PARTICIPANT QUESTIONNAIRE

Project title: An investigation of the effectiveness of training GP registrars in communicating with patients with an acquired communication disorder.

Where “effectiveness” refers to the amount of correct information you received from the patient; the level of comfort you felt during the consultation; the patient’s apparent comfort during the consultation; the, use of multiple communication strategies to facilitate information transfer; and the extent of patient’s competence revealed, please answer the following:

1. Rate the effectiveness of your communication with the person with aphasia during the initial consultation (i.e. before training). A rating of 0 indicates “not effective” and rating of 4 indicates “very effective”.

   0 1 2 3 4

   Not effective  Very effective

2. Rate the effectiveness of your communication with the person with aphasia during the second consultation (i.e. after training). A rating of 0 indicates “not effective” and rating of 4 indicates “very effective”.

   0 1 2 3 4

   Not effective  Very effective

3. Do you feel the SCA training is going to be beneficial in your career as a GP?

   Please circle:

   No  Yes