

Sounds, spelling and learning to read an Aboriginal language

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Abstract

Children who are in Australian Aboriginal language programs in revitalisation settings in New South Wales are learning an Aboriginal language at the same time as learning to read in English. Aboriginal languages and English have alphabetic writing systems and Aboriginal language spelling systems are usually more consistent than English. This means it is possible that learning an Aboriginal language spelling system might influence a child learning to read in English. We report on a pilot study where we explored whether learning an Aboriginal language in a revitalisation program at school is related to skill in decoding in English. We worked with 114 English-speaking children from Aboriginal and non-Aboriginal backgrounds in four public primary schools in two areas of regional New South Wales. Two of these schools were running a whole-of-school program in a local Aboriginal language in accordance with the *Aboriginal Languages K–10 Syllabus* (Board of Studies New South Wales 2003). We found some evidence to support a positive relationship between learning an Aboriginal language in a revitalisation setting and learning to decode in English. We also discuss limitations to our study and the need for further research.

Writing systems and learning to read

The writing systems used in Aboriginal language revitalisation programs in Australia use an alphabet to write words. Spelling systems (also called orthographies) in revitalisation programs have usually been established fairly recently. In addition

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spelling systems for revitalisation are often supported by a linguistic analysis of what are (likely to be) the distinctive speech sounds in the language. These sounds are called phonemes.

What are phonemes?

Phonemes play an important job in making sure that words with different meanings sound different. All languages have phonemes, including Aboriginal languages. As just one example, in the Gamilaraay language of north-west New South Wales (NSW), the word for eye is *mil* and the word for one is *maal* (Yuwaalaraay Language Program 2003). So the words mean different things. The only pronunciation difference is a short 'i' in *mil* and a long 'aa' in *maal*. There are other word pairs like this, too. We say these two vowel sounds we spell with the vowel letters *i* and *aa* are different phonemes in Gamilaraay.

Types of spelling systems

Compared with some other languages of the world the spelling systems used in Australian Aboriginal language revitalisation programs are regular systems. This means they are consistent, in that each letter or group of letters always stands for the same sound. In the Gamilaraay spelling system each letter or group of letters always stands for the same phoneme. This is called a phonemic system. There are also allophonic systems which indicate if there is more than one pronunciation of a phoneme, for example when the letter 'k' is between two vowels it sounds like an English 'g', but it sounds more like English 'k' when it occurs at the start or end of a word.

As an example of phonemic spelling here is the first line of the song '*Burrulaa Birralii*' (Lots of Children) in Yuwaalaraay language. We could have chosen any other group of words from any other Aboriginal language that uses phonemic spelling to illustrate this point:

Milan, bulaarr, gulibaa birralii

One, two, three children (Yuwaalaraay Language Program 2003, p. 4)

In this line of song the letter *b* always indicates a /b/ sound. The letter *l* always indicates the same /l/ sound, and so on. The same is true for vowels: there are three short vowel sounds spelled *i*, *a*, and *u*, and two long vowel sounds spelled *aa* and *ii*.

English spelling, language revitalisation, and learning to read

English works differently from the regular system described above. English does not have a regular spelling system to the same extent as Aboriginal languages. In English some words are spelled so that each letter stands for its usual phoneme, for example *dog* or *dig*. But it is well known there are also words which contain irregular or unusual spellings that are exceptions to the usual patterns. For example in *yacht* the 'y' stands for its usual phoneme, but the rest of the spelling (except the 't') does not.

This situation in English is part of the reason why it is recommended that children learning to read are taught to recognise some words instantly as wholes or *sight words*, as well as how to decode (*sound out*) words letter by letter, sound by sound, so that children can independently use alphabetic reading to read words that they know from spoken language but have not read before. Modern theories of reading and a large body of research evidence support the inclusion of phonics instruction in this way in Australian schools (see Coltheart & Prior 2007).

In current Aboriginal language revitalisation programs for young school-aged children or for adults, the spelling system is typically taught early in the program and literacy is a major focus of teaching activities and resources. In this situation the teacher is often learning the language too and, as written language has status for many people, it is common practice to base lessons around printed words and the spelling system together with some songs, conversational words, and other culture.

For children in language revitalisation programs in the community or at school, learning language is something they are doing alongside learning to read in English. This situation raises a question: What is the relationship between learning an Aboriginal language, especially its spelling system in a revitalisation context, and learning to read in English?

In recent pilot research we collected some data to try to start to answer that question. We considered that some of the relationships might be positive, based on theories of reading in English and existing research that others have done. But we wanted to see if that was true for Aboriginal languages in revitalisation contexts as well.

Learning to read in English is an intrinsically hard and seemingly unnatural thing. Many of the reasons relate to the cognitive demands of the spelling system: the choice of an alphabet (rather than a syllable or word based writing system) and the mix of regular and irregular spelling patterns. Much research evidence (see Rayner et al. 2001) indicates that an early challenge for all children is realising that English spelling is a writing system where letters represent phonemes. This is called the Alphabetic Principle. The Alphabetic Principle is difficult for many children to grasp probably because, until taught to read, children's memories for words are more likely to be based on larger units such as syllables and words. The task is probably made harder by the irregular patterns in English spelling. A related skill that children need and develop in learning to read with an alphabet is phonological awareness: being able to reflect on the sounds in words, rather than their meanings. Teaching activities designed to foster phonological awareness in pre-readers and early readers include syllable games (tapping, counting); rhyming, alliteration and phoneme-based activities; and explicit exploration of how speech sounds are made (using the mouth, tongue, nose, voicebox and lungs). It is recognised that learning to sound out and spell probably promotes phonological awareness too (see Castles & Coltheart 2004).

It seems possible that teaching a child a language in a revitalisation or heritage language situation, using written and spoken forms of the language, could potentially

help children learn the Alphabetic Principle and phonological awareness, and consequently improve their decoding skills. Alternatively, or in addition, children who learn consistent letter-sound relationships in a second language might simply be able to transfer them across directly into reading English. This seems most likely to happen if the letter-sound relationships are the same or very similar in the two languages, as in the letter *i* in English *pin* compared with *i* in Gamilaraay/Yuwaalaraay *gulibaa* (three), for example. Either way we might expect positive impacts on English reading from learning an Aboriginal language in a well taught revitalisation program with a typical emphasis on reading and spelling.

Previous research on learning to read in two languages

There is an increasing amount of research on children learning to read in two languages, which is the normal situation around the world. This research compares children's phonological (sound-related) and orthographic (spelling-knowledge related) skills in one language with their word reading skills in a second language (Bialystok et al. 2005; Chiappe & Siegel 1999; Cisero & Royer 1995; Comeau et al. 1999; D'Angiulli et al. 2001; DaFountoura & Siegel 1995; Durgunoglu et al. 1993; Geva et al. 1993; Gomez & Reason 2002; Gottardo et al. 2001; Luk & Bialystok 2008; Wang et al. 2005). For example Gomez and Reason (2002) looked at English reading skills in 69 seven–eight-year-old Malaysian children who spoke Bahasa Malaysia, which has a regular spelling system like most Aboriginal languages in Australia. Compared with children of the same age and reading experience who only spoke English the Malaysian children were better at reading aloud nonwords (for example *blif*, *nug*), which indicates stronger decoding skills.

Research which is especially relevant as a basis for our research in language revitalisation settings looks at children learning a second language but with quite limited hours of instruction, for example after-school or in-school heritage programs in Italian for English-speaking children (D'Angiulli et al. 2001; Yelland et al. 1993). This kind of program differs in important ways from a school-based revitalisation program but in its relatively limited hours of instruction it is similar. Both these studies found positive relationships; students who were learning Italian in this context had stronger decoding and word reading skills in English compared to students of the same age and school year who were not learning Italian.

Details about the study

We compared decoding skills in English in children who were learning a NSW Aboriginal language at school and children of the same age and school year who were not learning an Aboriginal language (or any other second language). Because of the observational nature of the study the data we collect are correlational. The data do not let us make conclusions about any specific or direct effect or impact of learning an Aboriginal language on English decoding skills. In this study we research the relationships or associations between learning an Aboriginal language and English

decoding skills, and acknowledge that many factors may be acting causally in this relationship.

Spelling systems of the Aboriginal languages in the study

This study involved two Aboriginal language programs for two different languages. The spelling system for these languages is shown in Table 1. These systems are phonemic. The only spelling difference between the languages is that the same sounds are spelled dj, nj in one language, and dy, ny in the other. Many of the consonant letters indicate consonant sounds which are similar in English for the same letter, for example n, d, l. Consonant sounds which aren't in English are written with letter groups, for example rr, dh. Some vowel letters indicate sounds similar to English vowel sounds, for example i, but some consistently have unusual values from an English perspective, for example a and u. The linguistic terms in the table are provided for accuracy and full information but it is not necessary to understand these terms to follow the rest of the chapter.

Spelling of consonant phonemes					
	Bilabial	Dental	Alveolar	Palatal	Velar
Stops	b	dh	d	dy / dj	g
Nasals	m	nh	n	ny / nj	ng
Laterals			l		
Rhotics			rr		
Approximants	w		r	y	
Spelling of vowel phonemes					
		Front	Central		
Short / Long	High	i / ii			
	Low		a / aa		

Table 1. Spelling system for the two Aboriginal languages in the study.

Children in the study

The child participants in our study were 114 Aboriginal and non-Aboriginal children who were in Year 1 (51 children) or Year 2 (63). We worked with those children who brought in signed parent/guardian consent forms and wanted to participate on the day (just one student did not want to participate). The children who participated were a mix of girls (56) and boys (58). They were typically seven- and eight-year-olds. A total of 18 children were described by parents as Aboriginal, 90 as non-Indigenous, and for 6 no information was provided. Four different Aboriginal language group backgrounds were represented among children according to parents and guardians. Full details about the participants are in Table 2.

Region	Condition	Year	No.	Mean age in years (range)	% Male participants (no.)	% Aboriginal participants (no.)
A	Language program	1	9	7.1 (6.5-7.6)	67 (6)	33 (3)
		2	20	8.4 (7.8-8.9)	45 (9)	40 (8)
	No language program	1	7	6.8 (6.3-7.4)	43 (3)	28 (2)
		2	17	8.1 (7.8-8.8)	65 (11)	6 (1)
B	Language program	1	20	7.2 (6.5-7.6)	55 (11)	0
		2	14	8.5 (7.8-9.2)	43 (6)	21 (3)
	No language program	1	15	7.4 (6.7-7.8)	40 (6)	7 (1)
		2	12	8.4 (7.9-8.7)	50 (6)	0

Table 2. Participant details.

Location of the study

We ran our study in four public primary schools. The schools are anonymous here to preserve confidentiality as required by the NSW Department of Education and Training. The schools were in two geographically separate, non-metropolitan areas

(Region A and Region B). Two schools were in one region (Region A – 53 children) and two in another (Region B – 61 children). In both regions the language program school was teaching a local Aboriginal language for all children in the primary school from Kindergarten to Year 6 in accordance with the *Aboriginal Languages K–10 Syllabus* (Board of Studies NSW 2003).

The comparison school was chosen for not having a language program, but having children from a similar mix of socioeconomic backgrounds to the language program school. Tables 2 and 3 below show that, socioeconomically, the backgrounds of students in the language program schools were similar to, and in some cases slightly lower, than in the comparison schools.

The numbers in Table 3 are the percentage of parents in each occupation or job category (Australian Bureau of Statistics ANZSCO [Australian and New Zealand Standard Classification of Occupations] categories). Each category is marked by a number beneath the table, and in brackets are the raw numbers.

		ANZSCO Category								
		1	2	3	4	5	6	7	8	Not employed
Region A	Language program	5 (2)	5 (2)	8 (3)	53 (4)	5 (2)	3 (1)	20 (8)	3 (1)	(9)
	No language program	16 (5)	23 (7)	19 (6)	16 (5)	13 (4)	3 (1)	6 (2)	3 (1)	(10)
Region B	Language program	2 (1)	17 (9)	35 (18)	21 (11)	12 (6)	4 (2)	6 (3)	4 (2)	(11)
	No language program	3 (1)	29 (10)	9 (3)	15 (5)	12 (4)	12 (4)	12 (4)	9 (3)	(6)

Key: 1 Managers, 2 Professionals, 3 Technicians and Trades Workers, 4 Community and Personal Service Workers, 5 Clerical and Administrative Workers, 6 Sales Workers, 7 Machinery Operators and Drivers, 8 Labourers.

Table 3. Background information: occupation of parent(s).

In Table 4 are percentages (and raw numbers in brackets) of parents reporting their highest level of education as primary, secondary, technical college or university.

	Primary	Secondary	TAFE	University
Region A, language program	0	58 (28)	40 (19)	2 (1)
Region A, no language program	0	30 (13)	51 (22)	19 (8)
Region B, language program	3 (2)	36 (23)	39 (25)	22 (14)
Region B, no language program	0	33 (14)	35 (15)	33 (14)

Table 4. Background information: education of parent(s).

What we researched?

We had a 10–15 minute individual session with each child. The child completed two activities with verbal encouragement and general praise throughout. At the end each child received a sticker or hand stamp for participating. They were told they could stop if they wanted but all the children finished the full session.

In the first activity the child was shown pictures of familiar things (big and little) and asked if its name was big or little (for example the word caterpillar is a ‘big’, that is to say long name for a little thing). If a child can do this it tells us they can reflect on the sound of a word separate from its meaning, an early reading-related skill called word awareness. In using this task, we followed Yelland, Pollard & Mercuri (1993) who found stronger word awareness among English speaking Kindergarten children learning Italian after school. Most children, who were in Year 1 or 2, did very well in this task whether they were in a language program or not, so we do not discuss this activity further in this paper.

The second activity was to find out each child’s level of decoding skills in English to see if that was related to learning an Aboriginal language. Each child completed the Martin and Pratt Nonword Reading Test (Martin & Pratt 2001); a standardised, five–ten minute individual test of decoding in English. The test uses nonsense words (for example yil, juf) so that it does not discriminate against children on the basis of vocabulary size (how many words they know in English). As nonwords all items are similarly unfamiliar to all children.

We administered the nonword reading test according to the test manual instructions. After the session we counted up an accuracy score for each child. We converted the accuracy score to a standardised score to take into account the child’s age. Then we compared the groups to see if decoding scores were higher for children in a language program.

Results

We found some evidence that there is a relationship between children’s decoding skill and whether or not they are learning an Aboriginal language in a revitalisation

setting. In particular we found that while children's decoding skills in Year 1 did not differ depending on whether they were in a language program or not, in Year 2 there was a difference. In Year 2, children who were in a language program had stronger decoding skills in English than children who were not in a language program. Figure 1 shows the mean (average) scores for students in the different groups.

This was a statistically significant effect, meaning that it was unlikely (less than five chances out of 100) to have occurred by chance. We used a 2 x 2 x 2 ANOVA (analysis of variance) to see if standard scores for decoding were related to Program (whether or not the child was in a language program), Region (A versus B) and Year of School (Year 1 versus Year 2). There was a Program by Year interaction, $F(1,106) = 11.09$, $p = 0.001$ ($\eta_p^2 = 0.095$, that is a medium-sized effect). This means that the effect of being in a language program depended on the year of school the child was in.

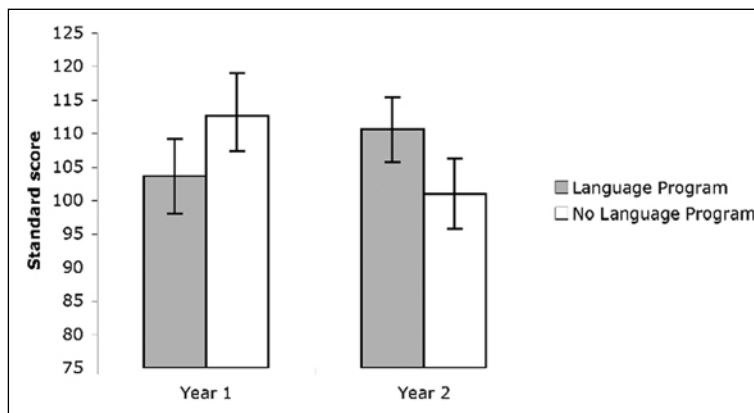


Figure 1. Relationships among school year, being in a language program, and decoding skill in English.

To explain the pattern in Figure 1 we did follow-up comparisons (that is post-hoc tests using Tukey-Kramer test for unequal n, critical value of $q_{3, 106, 0.05} / \sqrt{2} = 2.38$). These comparisons indicated that, statistically, decoding scores were the same in Year 1 for children in a language program versus children who were not, ($t = 1.90$). But, in Year 2, there is a difference: decoding scores are higher for children in a language program than for children who were not, ($t = 2.54$).

Decoding skills in our sample of children who were not in a language program were lower in Year 2 than in Year 1 ($t = 2.58$). All other differences among the average group scores in Figure 1 were not statistically different from each other.

Discussion

There are a number of limitations in our study that mean that we cannot draw strong conclusions from the data about any effect of Aboriginal language programs in revitalisation settings. We were restricted in the scope of our study by limitations including funding. We simply sampled groups of students from different years of schooling; we were not following the same students as they go from Year 1 to Year 2 (ours is a cross-sectional study, not a longitudinal one). Not all students in the schools participated; we simply worked with volunteers. We also knew which schools had a language program, and which did not, when we worked with the children. Our data collection methods were relatively protected from bias and expectations, but not completely. We also do not have detailed data about the nature of the English literacy programs in the different schools, and many other school factors that might also explain the results.

Given these limitations the pattern of results is suggestive of a positive relationship between English decoding skills from learning an Aboriginal language at school in a revitalisation setting. Without a language program, the performance of students in Year 2 was lower than in Year 1 relative to the reference norms (age-based performance expectations) of the nonword reading test. With a language program, students maintained their age-based level of nonword reading skill from Year 1 into Year 2, that is no decline in performance occurred. This is true in both geographical regions we studied. It is at least possible that additional practice with the regular phonemic writing system of the Aboriginal language as part of the language program acted to support children learning decoding skills in English reading.

This research is preliminary research; we have made a first step only. We need to do more research to be sure about our findings so far and to know exactly what is causing the differences in decoding skill. We also need to do more research to answer the broader question: What is the relationship between learning an Aboriginal language and students' reading (and writing) in English? This is a big question, but one which we think is well worth researching further.

Acknowledgements

We acknowledge the considerable contributions of Dr Jennifer Munro to the research project described here, and thank her for all her work. We thank the students who participated, the research assistant Caroline Haid who helped the students walk to and from class, the students' families and schools, principals, teachers and support staff at the participating schools, local and regional Aboriginal Education Consultative Groups, and the NSW Department of Education and Training. This project was supported by funds from the NSW Office of the Board of Studies and the Faculty of Education, University of Wollongong. The project received human ethics approval from the University of Wollongong (HREC 07/351).

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