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Introduction

This issue of the Learning Communities Journal emerged from a workshop on Indigenous sign languages research, the first of its kind held at the Charles Darwin University in July 2013. The workshop focused on a variety of issues related to sign languages, within and outside of Australia. The contributions outside of Australia deal with the Indigenous sign languages of Thailand, Ban Khor, and Indonesia, Desa Kolok. These two Indigenous sign languages give us some insight into communities in the region and are especially interesting when keeping in mind the longstanding contact between these countries and Australia.

This workshop was designed to raise awareness of the general public on the existence of Indigenous sign languages and as such, aimed at establishing a first dialogue between sign languages scholars, community members, educators, sign language interpreters, policy makers, and the public. Too often people have overlooked the signs used by Aboriginal people in the street, misinterpreted these signs as some arbitrary gestures, or even simply ignored the existence of these Indigenous sign languages. Further, there has recently been a spate of publications concerned with the documentation of sign languages in different parts of the world, as well as a growing interest in various types of sign languages within the field of Sign Linguistics. This workshop can be regarded as a contribution to this development in the field.

The first paper is from Adam Kendon, a pioneer of Indigenous sign languages of Australia. Kendon gives a brief survey of the characteristics of sign languages in use among Indigenous Australians, mainly as these are described in his book *Sign Languages of Aboriginal Australia* (1988), with indications for what appear to be some of the important questions that still need to be explored.

In the second paper, Elaine Maypilama and Dany Adone take a close look at the sign languages in use in certain communities of Arnhem Land. Following Kendon, they argue these sign languages are alternate languages used by the hearing population. Although these languages have been used for a long time as alternatives to speech under special circumstances, they are used nowadays in multiple contexts on a daily basis. At the same time, these sign languages function as the primary languages of the few Deaf people in these communities. Here the authors discuss some shared similarities among these alternate sign languages of Arnhem Land, giving the reader some insights into the sociolinguistics of these alternate signing systems. With the brief discussion on some characteristics of these sign language, the authors hope to have provided some understanding on the nature of alternate signing systems.

In paper three, Margaret Carew and Jenny Green discuss a sign language documentation and online resource development project for Indigenous sign languages from Central Australia. In particular, they track their workflow through from sign recording sessions to the publication of selected clips in the online sign language dictionary, www.iltyemiltyem.com/sign/. They analyse the various requirements of media publishing in environments typical of remote Central Australia, focussing on two distinct paths – one is primarily a film editing workflow and the other more suited to presenting media and metadata online. The paper discusses the challenges of working in a multilingual and multimodal environment for the design of sign language corpora and resources. Furthermore, Carew and Green draw attention to multiple outcomes from language documentation – materials presented through a range of media, resources relevant to academic and community audiences, curated archival data sets and refined corpora that enable further research.

Paper four is from Suzannah Jackson. Although the author could not join us at the workshop she was able to contribute to this special edition. Jackson takes a look at what she calls Indigenous Sign Language (ISL) which is a signed language used among communities of Deaf and hearing people in Far North Queensland (FNQ). To date, there has been little investigation into both the origins and morphological features of ISL. In this paper, some preliminary evidence suggests a link between modern day ISL and traditional Australian Aboriginal Sign Languages (AASLs). The paper discusses the idea that ISL may be comprised of several AASL contact languages and the users of the language, who originate from a range of remote Indigenous communities throughout FNQ, have progressed its morphology.

In paper five, Andy Butcher looks at some possible explanations for the origin of sign languages in Aboriginal Australia. It is well known there are a number of communities scattered around the world where hearing individuals routinely use sign language. Such communities are, without exception, culturally or geographically isolated and have a high proportion of profoundly deaf members. The sign languages of Australia's Aboriginal population appear to be unique in that almost every Indigenous community may have had its own alternate sign language, understood by all the population and used by the majority. The possible role of hearing impairment in the emergence and the maintenance of these languages has been largely ignored, as there is no evidence the proportion of profoundly deaf individuals is any higher in the Aboriginal population than in the population as a whole. Instead, the factors most commonly cited are ceremonial speech taboo, silent communication during hunting and the need for a lingua franca in a multilingual society. However, chronic *otitis media* with effusion (OME) develops in almost all Aboriginal infants within a few weeks of birth, leaving up to 80% of Aboriginal children with a mild to moderate conductive hearing loss. It is suggested that such a widely distributed population characteristic may have had an influence on the development of these unique alternate communication systems.

In paper six, Gede Marsaja presents his work on a small and isolated village in North Bali (Indonesia) in which Deaf and hearing people have lived together in a single community for many generations. In the local area, the village is popularly known as *Desa Kolok* (Deaf Village) due to its hereditary Deaf population. The article describes the life and the roles of the Deaf people in the village's community. The article discusses how the Deaf people in the village have been fully assimilated into the mainstream hearing community through a number of well-established social and cultural networks and activities that accommodate all aspects of the Deaf people's life and culture. The assimilation also involves widespread use of sign language, not only among the members of the Deaf families but also among the majority of the people from the non-Deaf families. Not less than two thirds of the hearing population was found to have used sign language regularly due to frequent contact with Deaf in the village.

In paper seven, Angela Nonaka deals with Ban Khor Sign Language (BKSL) which is a rare language variety known as a 'village' or 'Indigenous' sign language. This type of sign language develops in small face-to-face communities where historically there are/were: 1) demographically significant numbers of deaf people in the population; 2) high degrees of real or fictive kin relatedness among community members; 3) low levels of educational differentiation between deaf and hearing residents; 4) non-industrial, labour-intensive local economies; and 5) low degrees of occupational differentiation between deaf and hearing villagers. The most striking characteristics of the language ecologies of signing village communities, however, involve their local language ideologies and practices. In such communities, there are no sign language interpreters. Instead, it is common not only for deaf people but also for hearing residents to acquire and use the village sign language. Because it is widely used by both deaf and hearing people in the course of everyday life, the village sign language facilitates the inclusion (vs. exclusion) of deaf members of the community.

We would like to thank all those who have contributed to organise the workshop and to produce this special issue: the anonymous peer reviewers; Professors Ruth Wallace and Michael Christie for their support, the staff of the Northern Institute; all the community members involved directly and indirectly in this project; Melanie Brück and Astrid Gabel in Cologne, Germany; Annie Lowell; Katrina Britnell, the Northern Institute Research Support Services, and Belinda Snell; Melanie Wilkinson, Patricia Joy, Bruce Birch, Liz Temple, Naomi Kishtoo; Charles Darwin University, the University of Cologne and the Deutsche Forschungsgesellschaft (DFG). Thank you to Bruce Birch whose paper has not been included here but was contributed to the workshop. Finally, we would like to thank the audience of the workshop for a very vibrant discussion.

Professor Dany Adone
Guest Editor

Some characteristics of Australian Aboriginal sign languages with hints for further questions for exploration

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Keywords: Australian aborigines; alternate sign language; social interaction; spoken language

Introduction

When Europeans first began to venture from the coastal areas of what is today New South Wales and travel inland to areas of Australia beyond the Murray River Basin, it was noted, from time to time, the Aborigines encountered appeared to be using hand movements or "signs" as a means of communication. Probably the earliest report, published in 1874, is by Samuel Gason from South Australia. He noted the Dieri (as the local people were then known) made use of what appeared to be a complex sign language, which, he suggested, may have been connected to speech taboo practices associated with mourning. He claimed to have a thorough knowledge of this sign language, declaring it could be used for conversing about anything. He did not try to describe it, however, maintaining that to do so was beyond the capacity of words (Gason 1874, p. 35). After Gason's publication, several other reports appeared. For example, Spencer and Gillen, in 1899, described how women among the Warumungu used very complex signing, when, in mourning the death of a husband (and also certain other categories of male relatives), the practice was to avoid speaking altogether, sometimes for very extended periods (Spencer & Gillen 1899). In 1897, W.E. Roth published a detailed description of the use of signs in his monograph on the aborigines of Northwest Central Queensland (Roth, 1897). The many signs Roth described were (almost certainly) explained to him by men, and it was the use of signs as a means of communicating over distances that first brought this signing to his attention.

These sign languages are not related to deafness, but were developed by speaker-hearers evidently to serve as a means of communication for use in circumstances when to use speech would either be impractical or inconvenient, or when, for ritual reasons it was forbidden. I have referred to them as *alternate* sign languages, to distinguish them from *primary* sign languages, which develop in communities of deaf persons, or in communities which contain a high proportion of deaf persons. Here the signing is developed by people who have no access or very limited access to spoken language. Alternate sign languages have been described for some societies other than those of Australia. Those used by the North American Indians are quite well known (see Mallery 1972 [1881] and Davis 2010). There are several reports of sign use among hunter-gatherers in southern Africa (Mohr & Fehn 2012) and also from the forest-dwelling Pygmies of the Congo (Lewis 2009), as well as hunting societies from several other parts of the world (Divale and Zipin 1977). Certain European religious orders forbade speech in everyday life, and sign languages were developed in these communities. Umiker-Sebeok & Sebeok (1987) provide a collection of accounts of such sign languages, which may be centuries old (see also Bruce 2007). Comparative discussions of these and other alternate sign languages may be found in Kendon (1988, Chapter 13) and Pfau (2012).

A survey of the Australian reports from 1874 onwards into the middle years of the twentieth century, allowed me to propose (see Kendon 1988, Chapter 3) what appears to have been the pattern of sign language use throughout the continent before the presence of Europeans had had much impact on Aboriginal life. Sign languages were not reported from either the Eastern or the South Western coastal areas, they were not reported to be in use in southern New South Wales, Victoria, nor Tasmania. However, for the desert areas of South Australia, and northwards and westwards from there, there were enough reports of signing to suggest that it was in common use throughout these regions. This was also the case in the Cape York Peninsula and in northern and western Queensland. Reports of its use in the Kimberleys are scarce; it is only in Eastern Arnhem Land that we again encounter reports of its use (as we know from recent observation it is still in use there today). Signing was also reported to be in use in the Torres Straits islands (Haddon 1907).

Factors governing the use of alternate sign languages in Aboriginal Australia.

From my analysis of these records, it seemed the groups among whom signing was common and widespread were those in which speech taboos were often practised, either in association with male initiation rituals, or in association with mourning practices in which bereaved female relatives often refrained from using speech, sometimes for prolonged periods. However, although the distribution of both male and female speech taboos does correlate with the distribution of complex sign languages, it is also the case that signing has been reported from parts of Australia where speech taboos appear not to have been practised (as may well be the case in Arnhem Land) and it is also the case that signing can be widely used in many other circumstances, not just when speech taboos are being observed.

Accordingly, this raises the interesting question as to when signing might be used in everyday circumstances, as well as those governed by ritual observance. This is interesting in relation to much wider questions regarding the "communication economy" (Kendon 2004, p. 350) of a community: how are different communicative modalities, with their different properties and potentials, used in relation to one another? As my historical survey suggested, these sign languages have probably been in use among many groups in Australia for a very long time indeed. In the Aboriginal societies where this practice has been reported, members of these communities, both men and women, may often be able to *choose* to use sign or not. So an important question is: when and why are these sign languages used, and what are the factors that contribute to their elaboration? Speech taboos, as already noted, are one very important factor, but other features of Aboriginal sociality and ecology are also very important.

In the last Chapter of my 1988 book (Kendon 1988, Chapter 14), I discussed this issue at some length. Here I explored the idea the properties of signing as a communicative modality allow for modes of communication that are well suited to certain forms of interaction that are valued in Aboriginal society. For example, it can be used more discreetly than speech, making private exchanges possible in the otherwise quite public circumstances of every day Aboriginal life. It can serve as a useful mode of communication between people who are too far from one another for normal talk. If you can sign rather than shout, your interaction does not impose itself on everyone within earshot. Since signs can be varied in the explicitness of their performance, it is a useful medium for tentative communication, something highly valued in Aboriginal society in which interpersonal relations are under continual negotiation. Signing may have a less personal, more objective or neutral character, suitable for saying things in a more anonymous manner, something which is also valued in Aboriginal everyday life. And this feature of signing, also, may account for why it serves the wives of deceased husbands. Using sign may be a way of being less "present" in a social situation. Although allowing participation, at the same time, it allows the maintenance of a certain degree of distance or withdrawal.

If it is still possible, these ideas would well repay further exploration, although to do this will require a kind of ethnographic study that concerns itself with the organisation of everyday communication conduct (rather in the spirit of the kind inquiry Erving Goffman initiated - see, for example, Goffman 1963) and which is alert to all of the several different communicative modalities used and how these are differentially employed in different circumstances.

Relationships with spoken language

Another very interesting issue regarding the sign languages of Aboriginal Australia has to do with their relationship to spoken language. As already mentioned, every indication suggests that these sign languages have been developed by speakers as *alternatives* to speaking - this is why I have termed these *alternate sign languages*, distinguishing them from *primary* sign languages, as these develop within communities of deaf, or in communities, or even just within families, where there is a relatively high proportion of deaf persons. In such circumstances, signing may be employed as a means of communication between hearing and deaf, as well as within communities of deaf persons. Primary sign languages differ from alternate sign languages insofar as they are developed by people who have no direct access to spoken language.

An important issue, then, in regard to alternate sign languages, such as those found in Aboriginal Australia, is the question of what relation, if any, they may have with the spoken languages in use in the community where such an alternate sign language has developed. This emerged as a major theme of my own investigations. These are reported in detail in four chapters of my 1988 book.

As I reported there, in their most elaborate form, as observed among older women among the Warlpiri (one of the language groups I worked with most extensively), these sign languages converge upon, or have a strong tendency to develop toward being a kind of kinesic (mainly manual) rendition of the units of meaning that are expressed by the semantic morphemes of the spoken language. Thus, many nouns are signed as renditions of the morphemic structure of the spoken word, rather than having a sign derived from a representation of some feature of the item in question. To illustrate, the word for “sun” in Warlpiri is *wanta*. The word for a species of red ant is *wantawanta*. In signing *wanta*, the hand, with just index and middle fingers extended and spread, and oriented with palm facing upwards, is lowered from an almost vertical position to a horizontal position in an action that might be derived from tracing the sun’s trajectory in the sky. In signing *wantawanta*, the same hand shape and orientation as that used for *wanta* is employed, with a movement similar to that used in *wanta*. This, however, is now much abbreviated in amplitude and it is repeated. Thus, just as, in the spoken language, the word for “red ant” is a reduplication of the word for “sun”, so in the sign language, the sign for “red ant” is a reduplication of the sign for “sun.” There are many cases in which we find words that are compounded of two or more free morphemes are signed as compounds of the signs that are used for the component morphemes when these are used separately. Besides this, there are signs for suffixed forms (such as possessives), but tense and subject-object marking morphemes are not signed. This kind of relationship between the sign language and the spoken language is one of the reasons why the sign languages of different Aboriginal groups differ from one another. They also differ among themselves in many other ways, although the sign languages of adjacent groups tend to show some signs in common. In some domains, such as that of kinship, many signs seem to be similar in widely separated parts of Australia.

I also examined, with the help of expert older Warlpiri women signers, how narrative discourse was constructed. We compared the same narrative when signed or when spoken. Here, it appeared, the free re-combining of morpheme sequences in spoken Warlpiri that is

so characteristic of that language, was observed in the signed versions. So, at least in the narrations of Winnie Nangala[1] whether she spoke or signed in telling a story, she constructed her sentences in much the same way. This was confirmed when comparing shorter signed utterances with spoken utterances as observed in other older women signers (see Kendon 1988, Chapter 9).

All of this led me to conclude, at least among the Warlpiri (and also the Warumungu, a related group), these sign languages *develop toward* becoming a kinesic rendition of the semantic units that are provided by the semantic morphemes of the spoken language. I say *develop* toward, because in a survey I undertook to look at levels of knowledge of sign language among women of different ages at the Warlpiri settlement where I did most of my work (Yuendumu), I found the younger women, in their signing, showed much less spoken-morpheme to sign mapping (Kendon 1984).

Somewhat speculatively, I have suggested Warlpiri signing (as well as that of other North Central Desert groups, such as the Warlmanpa and the Warumungu) undergoes a kind of evolution toward being a kinesic rendition of the semantic categories supplied by the spoken language. In this way it recalls the development of writing. If one examines the history of writing, one finds it always starts out as a method of graphically representing concepts independently of how these might be represented in spoken language but then, over the course of its history, it converges more and more upon becoming something that can be interpreted as a rendition of what can be spoken. A similar process appears to be at work in an alternate sign language such as Warlpiri (Kendon 1988, p.432ff), although it is notable very few signs develop the reflective phonological features of speech.

A comparative survey of such alternate sign languages suggests this process of convergence toward a representation of concepts as these are rendered in spoken language does not always occur. Indeed, both the manner and extent of the relationship between an alternate sign language and spoken language varies. An alternate sign language such as that described by Barakat (1975) in use in a Cistercian monastery in the United States suggests an important influence on this sign language of English in its written form. In contrast, at least if we follow the analysis of Plains Indian Sign Language as undertaken by La Mont West (1960), this sign language has little to do with spoken language in its organisation.

Reviewing these various examples (see Kendon 1988, Chapter 13), at least three factors suggest themselves as governing whether and how an alternate sign language will converge in some respects upon the spoken language of its users. First of all, alternate systems that are restricted or specialised in their use, such as the kinesic codes used mainly in hunting (as among the hunter-gatherers - see, for example, Lewis 2009, Mohr and Fehn 2012) or, in industrial societies, in settings such as broadcast studios, stock exchanges, race tracks, factories, or in underwater settings (see Crystal and Craig 1978 for discussion of such systems), show very limited tendencies to relate to spoken language. Second, if the alternate sign language develops in communities where more than one spoken language is in use, as appears to have been the case with Plains Indian Sign Language which may have been used as a kind of *lingua franca*, it is not likely to show much convergence with any spoken language (West 1960, Davis 2010). I understand preliminary analyses of the sign language referred to as Yolŋu Sign Language, as used in Arnhem Land, suggests it does not show much "mapping"

1. Winnie Nangala, Ruby Nangala Robertson and Judy Nampijimpa were my main Warlpiri consultants at Yuendumu, where I was also given indispensable help by Mary Laughren, a linguist at that time engaged on compiling a dictionary of Warlpiri.

onto the spoken language, and in this it differs from the sign languages of the North Central Desert, such as Warlpiri (Bauer 2012). This may be because the communities where Yolŋu sign language is used are multilingual, in a way that the North Central Desert communities are not. If this is so, this might explain, at least in part, why Yolŋu Sign Language shows much less tendency to "map on" to a specific spoken language. Third, the morphological character of the spoken language in the community where an alternate sign language develops must also be considered when looking at how the alternate sign language may relate to it. Thus, a language such as Warlpiri, which is highly agglutinative with sentences being constructed from sequences of morphemes with very little inflexion, might seem to lend itself rather easily to a form of morpheme-by-morpheme representation in another modality. The languages of North America, on the other hand, in many cases represent the extreme of a so-called "fusional" morphology. Here, we would predict, even where an alternate sign language is developed in relation to just one of these languages, it would not show anything like the same sort of convergence toward spoken language representation observed in the Australian North Central Desert. According to such limited information we have on the relationship between these sign languages and the spoken languages used in the communities where they have been developed, this prediction appears to have been borne out (see West 1960).

An outstanding issue in the study of Australian Aboriginal sign languages that remains, thus, is of how these do relate to spoken languages: Is there variation in the nature of this relationship, and what factors govern this variation? If it were possible, we need more studies so we could compare, across Australia, how different alternate sign languages vary in how they are patterned in relation to the spoken languages and try to identify the different conditions that might be related to this. I think the issue of how different language codes, differing in modality, may relate or diverge from one another raises interesting theoretical issues about the relationship between "meaning units" and how these meaning units get represented in different modalities. There is, I suppose, a sort of reciprocal relationship between the modality employed in expression and the "meaning units" that get expressed. "Meaning units" indeed govern what gets expressed, but they are themselves governed by what a given modality makes possible for expression.

Comparisons with primary sign languages

Another question that needs much further exploration has to do with how these alternate sign languages compare structurally with primary sign languages. In my 1988 book, I reported very detailed analyses of sign formation, comparing this with what was then available on primary sign languages, mainly American Sign Language. Some general points that emerged from this were the North Central Desert (NCD) sign languages are overwhelmingly *manual*. Almost no use of facial actions was observed while signing. This seems to be consistent with its use as an alternate when observing a speech taboo. Movements of the mouth tend to be suppressed, when signing when speech is tabooed. It is interesting to observe, however, that women observing speech taboo often accompany their signing with a kind of "grunting" that seems to mark points of emphasis and to reflect variations in tone and pitch of the voice - as if prosody may be expressed audibly but not anything that involves oral articulation. In this, these sign languages are in marked contrast to primary sign languages.

With regard to the components of sign expression - sign location, sign actor (hand configuration and orientation), sign action - although one handed signs are very much in the majority, and although sign locations are employed that had not been reported for primary sign languages at that time, the principles of sign formation were otherwise found to be very similar to those reported for primary sign languages. I concluded my discussion of comparisons between alternate and primary sign languages with these words:

> *"there are enough important similarities [between sign formation in NCD sign languages and American Sign Language] to allow us to maintain the (perhaps rather unsurprising) view that the principles governing sign formation in the NCD sign languages are the same as those found operating in any other sign language."* (Kendon 1988, p. 158).

I then continued:

> *"Because of the mode of production of signs, and given the characteristics of both the anatomical structure and the visual perceptual systems of the producers, we may expect all sign languages to display certain features in common. The results of the analyses of the formational characteristics of the NCD sign languages seem to be consistent with this position."* (Kendon 1988, p. 158).

I followed this analysis of sign formation with a study of the relationship between sign form and sign meaning (Kendon 1988, Chapter 6). Principles of "iconicity", as worked out by Mark Mandel (1977) for American Sign Language, and which I had further explored in relation to a primary sign language I had worked on in Papua New Guinea (Kendon 1980, Part II), were further explored in relation to mainly Warlpiri signing. In general, it was concluded the same principles by which iconic expression manifests itself in signing, as explored by Mandel and myself in respect to other sign languages, were also in operation with Warlpiri sign language. It is notable, however, that a very large number of Warlpiri signs defy any sort of "iconic" derivation. I suggested this is evidence for the antiquity of this sign language. Nevertheless, we can detect processes that transform imagistic representations into formations governed by system-wide sign formation processes (so-called "phonological" processes) in Warlpiri sign language, just as we may find them in all other sign languages that have been examined so far, whether primary or alternate.

Warlpiri and other NCD sign languages do make limited use of face and gaze orientation, deictic (pointing) processes and the establishment of virtual spaces as referential devices in ways very similar to what has been observed in primary sign languages. However, according to my observation, nothing in these sign languages that seemed to resemble the so-called "classifiers" that are found in primary sign languages (Emmorey 2003), were found in either Warlpiri or Waramungu sign languages, the NCD sign languages where I was able to obtain signed narratives (where you might expect to see "classifiers" in use). This lack of classifier use may well be related to the tendency for these sign languages to be tied to spoken language. They tend not to exploit, very much, the spatial-expressive potentialities of the kinesic medium as is found so extensively in primary sign languages, and also, according to La Mont West (1960), in Plains Indian Sign Language. According to him, this sign language functions as a system more or less independent of spoken language, and makes extensive use of spatial relationships for grammatical purposes.

Comparative studies of different Australian Aboriginal sign languages remains much needed. I did include a comparative study of five different NCD sign languages, mainly from a lexical point of view (see Kendon 1988, Chapters 11 & 12), but much more should be done. And comparisons with primary sign languages - and today we have a wealth of knowledge of them that was not available in 1988 - would also be very valuable.

Deafness and alternate sign languages in Aboriginal Australia.

The final issue I would like to comment on is the question of whether and how, and to what extent, deaf Aboriginal persons make use of these sign languages. In my own experience

in the field at Yuendumu and elsewhere in the North Central Desert, I encountered but two deaf individuals, and neither made any use at all of the local Aboriginal sign language. One communicated only by writing, the other had learned AUSLAN (Australian Sign Language) at an institution in Adelaide and combined this with expressions developed among members of his family. I had no opportunity to study his signing and cannot say whether, in his signing, he was influenced by the local alternate sign language. From what I was told by residents at Yuendumu, and elsewhere, it seemed to be the general opinion the local alternate sign language was not used by deaf persons, however I find it hard to believe deaf individuals in communities where there are alternate sign languages would not, in such signing, exhibit some influences from the alternate sign language.

In modern times, as a consequence of Aborigines being largely forced to live in large settlements, often in rather unhygienic conditions, quite unlike their traditional modes of life, there has been a spread of ear infections that create post-lingual deafness in children on quite a large scale (Bauer 2012). Where this is the case, it is an interesting question as to how and in what way such children make use of signs and the extent to which, in doing so, they borrow from any alternate sign language that may be locally present. It seems clear, however, that Australian Aboriginal sign languages were fashioned by hearing people as part of a complex development of communication strategies developed in relation to ritual and other communicative needs of everyday life and, in the first instance, in any case, had nothing to do with deafness.

A concluding reflection

Alternate sign languages have not attracted much attention from sign language researchers - no reference is made to them in the otherwise comprehensive survey of sign languages edited by Diane Brentari (2010), for example. This may be because students of sign language, have been put off by the fact they were seen to have a direct relationship with spoken language, or were even, perhaps, in some way derived from them and would thus not be regarded as “pure sign languages”. Indeed, my own work on the Australian North Central Desert Languages shows they can be strongly influenced by the spoken languages of their users. However, it is my view it is just this relationship with spoken language that gives these sign languages a special interest. It raises many questions about the relationship between modality of expression, the semiotic properties of different modalities, and how these are interrelated in the course of their use in everyday life, where more than one modality of linguistic expression, each with its own properties, is simultaneously available for use in interaction. The issue of how these modalities influence one another, when systems in parallel are fashioned in the way that appears to have happened in Australian Aboriginal communities, would seem to be one of particular fascination, especially in these days, when “multimodality” is all the rage.

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The Sociolinguistics of Alternate Sign Languages of Arnhem Land

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Introduction

A look at the research done so far on sign languages shows a focus on the so-called primary sign languages, i.e. sign languages that are acquired by Deaf people as their first language. There is a substantial amount of studies on sign languages around the world, e.g. AUSLAN in Australia, Deutsche Gebärdensprache (DGS) (German Sign Language) in Germany, and American Sign Language in the States. More recently we note a diversification in sign language research, with an increase in sign languages other than the ones found in Western countries. We have studies on Jamaican Sign Language (Cumberbatch 2012), Mauritian Sign Language, (Gebert and Adone 2006, Adone 2012), Bhan Khor Sign Language (Nonaka 2012), Kata Kolok (de Vos 2012), Desa Kolok (Marsaja, 2015) among others. In spite of some effort to diversify the field, still very little is known on alternate sign languages. As these sign languages are underrepresented and under-documented in the field, we aim at providing some insights into these languages.

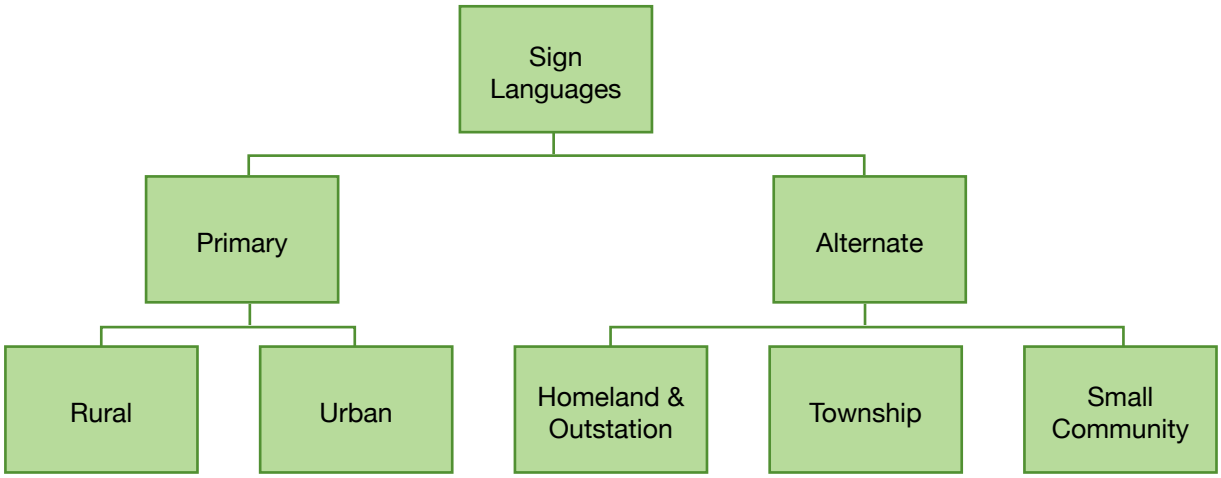
This paper is organized as follows. In section two we attempt at distinguishing the various types of sign languages. In section three we give an overview of the sign languages in Arnhem Land as reported in the past and present. Section four describes the sociolinguistic contexts in which these alternate sign languages are used. Section five discusses some linguistic features shared by these alternate systems. Section six provides a brief conclusion and some thoughts for future research.

Classification of Sign Languages

Based on the ongoing discussion in the field of sign language research we find many types of sign languages. One major distinction is between primary and alternate sign languages. Kendon (1988) proposed this distinction to do justice to sign languages acquired as first languages as compared to those that are used as an alternative mode of communication. However, this distinction presupposes that these two types are separate types. Primary refers to the first language, while alternate is used as an alternative to speech under special circumstances (Kendon 1988). This implies the language is learnt as a second language. This is obviously not always the case. A close look at some of the alternate sign languages in Arnhem Land and how/when they are used reveals that in some communities hearing people acquire these sign languages from birth, thus making the hearing population bimodal bilingual and not second language users of sign languages.

Table 1 is an attempt to classify the various types of sign languages that have been reported in the literature so far.

Table 1: *Preliminary Classification of sign languages*



Source: Data collected by Adone and Maypilama in several communities in Arnhem Land

This classification is based solely on sociolinguistic grounds specific to the Australian context. Under "alternate" sign languages as used in Arnhem Land, Australia we find a three-way distinction. Whether these categories, are relevant for the sign languages in Central Australia, remains to be determined. One should note this table is by far not complete as the classification represents work in progress and is open to modification as we learn more about alternate sign languages.

Under "homeland and outstation" we classify sign languages found in those small settlements with small groups of people usually belonging to one or two families and their close kin. These settlements on clan territories are called 'homeland centers' or 'outstations' and are found throughout the remote areas of Arnhem Land. Life on homelands are organized more tightly around "landownership and care for sites family and ancestral connections" (James 2014:22), as such people on outstations live a more traditional life than in townships. On Elcho Island for example, Dayeri and Gawa are two such outstations. Around Gunbalanya we found approximately 13 outstations. We include the sign language variety used on outstations because we found some differences when comparing them to the sign languages found in townships. Such a difference is seen in the use of different signs or older signs. For instance, there are at least two signs for 'telephone', one of which is older and is used by old members of the outstations. Another example is seen in the sign for 'cats in the cradle' games which is a game children used to play with string made from shredded bark string (for example) to form shapes representing local locations, animals, objects. During an elicitation task, many young adults (25-30 years of age) living in townships, were not able to give us the signs for some cultural artifacts/knowledge such as 'string bag' or celestial bodies. In contrast, most old people on outstations knew these signs. This type of observation reinforces our view that outstations have possibly retained some 'old' signs that are either not commonly used anymore or have been replaced by other signs in the township sign languages, a possible scenario given that townships are the result of the government sponsored mission project to end nomadism among people over their land.

Under “townships” we count Maningrida, Galiwin’ku, Minjilang etc. These are large settlements of 1000 people or more that have been developed by the government. In these townships we find several groups of Aboriginal people, sometimes from widely separate linguistic and geographical groups, living in close quarters with others, and with some usually poor facilities such as a shop, petrol station, police station, school, and maybe an airport. Under “small community” we would count Gapuwiyak, among others, which stand in between townships with smaller populations and outstations. Outstations generally have very few facilities but life there is less crowded and more pleasant.

Overview on Sign Languages in Arnhem Land: Past and Present

A look at reports on sign languages in Australia shows several scholars mentioning the use of sign languages across Arnhem Land, including Warner (1937) on Murngin Sign Language (also known today as Yolŋu Sign Language), Folesche (1886) on Larrakia Sign Language, Priest (1986) on Tiwi Sign Language, and Bani (1981) on Torres Strait Island Sign Language.

Based on a more recent study on the sign languages in Arnhem Land (Adone 2014, Adone & Maypilama 2014b), we find sign languages such as Yolŋu Sign Language (henceforth YSL) as used in Milingimbi, Yirrkala and Galiwin’ku, or the sign language used by Burrara people in Maningreda to be structurally quite elaborate. At this point we cannot establish yet whether the sign language used by Iwadja speakers and Bininj Gun wok speakers (Croker Island) and the one used in Gunbalanya by Kuwinjku speakers are also structurally elaborate. However, based on some preliminary work done by Adone (2014), it seems in some places the sign language is highly developed in the sense it is used in a wide range of contexts, has a large lexicon (more than 1000 signs) and has complex constructions, while in other places they might not be or alternatively they might have lost some of their complexities.

One factor these sign languages all share is they are endangered languages, with varying degree of endangerment. We will not discuss the degree of endangerment of these languages in this paper as it would go beyond the scope of this article, however Adone & Maypilama (2013) provides some information.

Map 1 gives an overview of some communities in Arnhem Land which we have observed the use of sign languages. This map is not exhaustive.

Map 1: *The use of sign languages in communities of Arnhem Land*

Source: © OpenStreetMap

Around Darwin we have Larrakia Sign Language (henceforth LSL) that was reported by Folesche (1881). In 2012. Walsh (personal communication) mentioned the use of hand signs by some Larrakia Deaf people to one of the authors. Adone consulted the signs compiled by Caine and Reid (1997 on Tiwi Sign Language (henceforth TSL) and discussed the sociolinguistic data with Adam, a Tiwi man. In 2013 two language consultants Charly and Maggie in Minjilang, Croker Island, discussed the sociolinguistics of the sign language used by Iwadja people with Adone and Birch. In 2014 Andy and Donna, two high ranked Aboriginal people in Gunbalanya discussed the situation of the Kunwinjku people using sign language with Adone during her second visit in the community. In Maningrida a traditional elder who has now passed away provided Adone with the first information in 1996. More recently, Adone was able to discuss Burarra Sign Language (henceforth BSL) with Rebecca Green, one of the sign languages used in Maningrida. Data collection on Yolŋu Sign Language in different locations (including Elcho Island, Milingimbi, and Yirrkala) started in 1992 and was endorsed by Elaine Maypilama, Kathy Gudjarak, Dorothee and other language consultants. Maypilama lives on Elcho Island and is one of the traditional owners of the place and Djambarrpuyngu, the language which belongs to Elcho Island. The data is naturalistic and elicited. Furthermore we have collected meta-linguistic observations by members of the local communities.

Sociolinguistic Characteristics of Alternate Sign Languages of Arnhem Land

Map 1 shows the sign languages the authors encountered during their visits to these communities. Despite differences between the East and West Arnhem Land languages there are similarities in the social organization and the principles of interaction in all these language groups reflected in the sign languages.

First of all, all of these sign languages are used as a L1 by the few Deaf people living in the communities as well as by the members of the hearing community, thus making the hearing users of these sign languages bimodal bilinguals. In other words, the people use languages in two of the three modalities (visual, auditory and tactile) available to our species, namely speech and signs to communicate depending on the contexts. We will not include tactile modality in our discussion because of the lack of space. To the best of our knowledge, this environment in which speech and gestures and signs coexists is rarely attested elsewhere in the world with the exception of Native American communities (see Farnell 1995, 2003), but is very common in Aboriginal Australia. Two characteristics of this environment are: speech and gesture/signs are intertwined and used in parallel in conversations which has led to the so-called ‘co-speech gesture situation’ and the switch from speech to signs or vice versa which we label here as ‘modality switching’. These two characteristics seem to be the key characteristics present in the context of alternate sign languages. The Yolŋu communities can be taken as an excellent case. Both hearing and Deaf people acquire the language from birth onwards (Adone and Maypilama 2013). This might not be the normal case in all the communities of Arnhem Land nowadays. Several members of some West Arnhem Land communities (e.g. Gunbalanya and Minjilang) have expressed their concerns on this.

- For the hearing community these sign languages are alternate modes of communication they use in the following contexts:
- hunting, and fishing
- long distance communication
- ceremonies and rituals in which silence is culturally requested or speech is regarded as culturally inappropriate
- in the proximity of sacred objects

- in time of mourning when the names of the deceased are not used and kinship signs are used among other devices to refer to the deceased
- in daily interaction when speech is effortful

In both hunting and fishing hand signs are used to communicate because noise would disturb the animals. However there are other activities in which sign language is also used, such as when walking in the swamps looking for mangrove worms. In this context it is important to use sign language because of crocodiles lurking in the swamp.

When people are not able to communicate through spoken language over long distance, sign language is usually used. This is seen in questions asked over long distance such as 'where are you going' or 'do you have a smoke for me'. People passing by in a car use sign language to ask for information such as 'river up or not'.

In various types of ceremonies, for example initiation ceremonies, novices use sign language because the use of spoken language is forbidden. We were also told that the male elders involved in the ceremony, for example. the ceremony 'bosses', also use sign language when they do not want to be overheard by the novices. Furthermore, communication in general, as well as some dances, are also performed with the use of sign language in funerals. Sign language is also used when on sacred grounds or close to sacred objects. These contexts have one common denominator: silence is culturally requested because speech is regarded as inappropriate.

In times of mourning, the name of the deceased is not used and reference to the deceased can only take place indirectly. This means that kinship signs showing one's relation to the deceased and other means of reference are used. There are differences among the various groups. Green (personalcommunication.) recalls that people announce the death of a person among the Burarra by sign language at a ritual called a hearing ceremony. This practice is confirmed among the Yolŋu people (James 2014).

In daily interaction. such as talking at the same time as someone else, using speech and/or sign language may be used (see Maypilama & Adone 2012, 2013).

At the beginning of this section we mentioned briefly the bimodal bilingual situation in which co-speech gestures/signs and modality switching seem to play a determining role in the sociolinguistic profile of alternate sign languages of Arnhem Land. Two further sociolinguistic factors associated with the use of alternate sign languages are shared knowledge, typical of small-scale communities, and circumspection. All these communities are remote and small in size, thus there is shared knowledge. Added to that, every member of the community is tied to other members through the kinship system. This state-of-affairs is reflected in the grammatical system, such as reference tracking. Circumspection is another factor that determines the use of alternate sign languages in these communities. As a highly valued principle in Aboriginal interaction (Levinson 2007, Garde 2008, Maypilama and Adone 2012) it motivates the use of discrete, concealed communication, which can be achieved by the use of signs.

Some Structural Properties of Alternate Sign languages of Arnhem Land

After a close look at the sociolinguistics we will briefly mention some of the structural properties that are typically shared by alternate sign languages studied here. There are four properties which we will briefly discuss here: the choice of non-manuals, variability, little morphology and iconic signs in compounds. All sign languages investigated so far, independent of their type, share four parameters (location, hand-shape, movement, orientation) for the articulation of an individual sign (for more details see Johnston and Schembri 2007). Furthermore, the use of non-manuals, for example facial expressions such as eye blinking, squinting, nose wrinkling, puffed cheeks, pouted lips, eye gazing, eye brow raising, mouthing and mouth gestures etc) is

also important. Some of these facial expressions are commonly attested in many sign languages around the world. In some cases they share some common functions. Although there are some general tendencies in the use of non-manuals across sign languages, it seems the use of facial expressions is very much dictated by the culture in which these sign languages emerge. A piece of evidence in support of this view is provided by the use of eye gaze. While eye gazing is very common in many sign languages of the western world, eye gazing at people in the Aboriginal, especially in the Yolŋu world, is not appropriate because it violates an important rule underlying Aboriginal interaction - respect for others and bidding for power. Thus, instead of eye gazing, we find eye pointing in cases where gazing is directed towards people. Eye pointing in this context is taken to be a very short look (of a few milliseconds) in the direction of the person referred to. In these cases, the signer's eyes move swiftly in the direction of the addressee and go back to its starting position or somewhere else for a very short time. At the same time, one uses lip pointing too as an additional means of reference.

Although these alternate sign languages might have reached a certain level of conventionalization, there is high variability both on the macro- and micro-level of grammar. This is first and foremost attested in the use of space, when compared to the use of space in highly conventionalized and primary sign languages. The use of space in established sign languages is confined to a certain area as seen in picture 1. This space "extends from approximately just above the head to the waist, and in width from elbow the arms are held loosely bent" as seen in pictures 2 and 3 (Brennan 1992:22). In the alternate sign languages studied here, signers exploit a larger space as seen in picture 4 in which a kin sign is used by touching one's calf.

Picture 1: *Use of space in primary sign languages*

Picture 2: *Pointing to a remote area*

Picture 3: *Pointing to an even further location*

Picture 4: *Sign for SIBLING*

Although we cannot discuss the use of larger space in detail here, we would like to point to two factors that can account for this, namely that Aboriginal people use an Absolute Frame of Reference to refer to directions and locations, as well as direct pointing as a component of the pointing repertoire (Levinson 2003).

Further evidence for variability is seen in the use of signs such as UNCLE that is a combination of a hand-shape and movement as seen in picture (5). Some signers use the sign UNCLE with a short slap on the left hand, while others have their left arm standing vertical next to their body. The same type of variability is seen in many other signs including the sign for the dyadic relationship 'grandchildren-grandparents':

Picture 5a and 5b: *Variability in the sign UNCLE (mother's side)*

Picture 6a and 6b: *Variability in the dyadic sign GRANDPARENTS-GRANDCHILDREN*

Another form of variability is attested syntactically, that is in the use of so-called non-manuals (e.g. facial expressions such as eye and lip pointing) that accompany manual signs to express some form of reference marking. As mentioned earlier, eye gaze is culturally not appropriate towards people, but eye pointing is. The two facial expressions, eye and lip pointing, are combined and used simultaneously with the verb 'fly' which is signed manually as in:

1) NGAPIPI YIRRKALA FLY FUNERAL

'My uncle is flying to Yirrkala for funeral'

when referring 'quietly' to someone in the surrounding area without attracting attention to the signer or the message passed on about the uncle. However both of these facial expressions are sometimes used on their own or are sometimes combined.

Picture 7: *Eye pointing*

Picture 8: *Lip pointing*

As compared to established sign languages, these alternate sign languages clearly show 'less' morphology. So far, we find the use of plain and directional verbs being attested, in contrast to established sign languages with a clear distinction between 'plain', 'directional' and 'agreement' verbs. Agreement usually marked by morphology is typically found in verbs such as 'give'. These verbs are expressed by little or no morphology. Some signers use 'give' as a directional verb only while others don't. In elicitation tasks, when asked to sign a sentence such as 'I gave a clap stick to three men', we have the verb GIVE signed by the movement of the hand departing from the signer's body towards referent 1 and returning to the signer's body. This movement is repeated three times in three different locations, accompanied by lip and eye pointing to mark locations of the referents. Other signers sign this sentence with one time movement departing from the signer's body towards one point in space and from there to another location etc. This is followed by the sign MAN referents and the sign THREE. Furthermore, we notice the sign CLAPSTICK is expressed as a separate sign instead of being 'incorporated' into the verb.

In the area of derivational morphology we find compounds for non-Aboriginal signs consisting of two or three components such as in AIR CONDITIONER or WASHING MACHINE:

Picture 9: *BOX COLD = AIR CONDITIONER*

Picture 10: *BOX WASH = WASHING MACHINE*

Signs for certain common activities such as ‘sleep’, ‘eat’, and ‘dance’ are iconic and shared across these alternate sign systems. An example is found in the same iconic minimal pair signs ‘police’ and ‘in gaol’ in YSL, KSL, and TSL:

Picture 11a: *Sign for ‘police’*

Picture 11b: *Sign for ‘in gaol’*

Discussion

A look at the literature shows two possible explanations for alternate sign languages in Australia. Kendon (1988) has argued that female speech taboo was probably one of the reasons for the emergence of alternate sign languages in the North Central Desert area of Australia, thus linking the existence of these sign languages to culture. Butcher (2015) argues that hearing impairment could account for the emergence of these alternate sign languages, thus linking the existence of the sign languages in Aboriginal Australia to Deafness. In the case of these sign languages under investigation here, we believe the cultural component, the request for silence/ the inappropriateness of speech in certain contexts (i.e. the proximity of sacred grounds, objects) as well as the underlying principle of circumspection in Aboriginal interaction account best for the existence of these sign languages. Further factors such as bimodal bilingualism being deeply rooted in the cultures with the effect of co-speech gestures/ signs and modality switching being the norm of interaction, can certainly not be overlooked. These factors play a key role in the sociolinguistic profile of alternate sign languages found in Arnhem Land. This is why we have taken a close look at the contexts of YSL, ranging from daily interaction to highly ritualized ceremonies.

We have found four properties that can be attributed to the alternate sign languages studied here: choice of non-manuals determined by cultural factors, variability, 'less morphology' and the use of iconic signs in the decomposition of compounds. As far as the non-manuals are concerned, it has become clear that the use of eye gaze in connection with people is not possible because it violates a crucial cultural rule. Thus, instead of eye gaze, we find eye pointing instead. Variability has been attested both on the lexical and syntactic level. On the lexical level, we found handshapes and location being affected. On the syntactic level, it is the use of accompanying non-manuals with signs to express grammatical relations. Eye and lip pointing normally occur in conjunction with each other, but sometimes they do not. 'Less morphology' refers to the fact that agreement seems to be absent in some contexts. Certain verbs require some agreement in order to make the argument structure clear. In most sign languages, some kind of agreement is used to do so. In these alternate languages, we find rudimentary forms of agreement, reminiscent of agreement marking in Creole languages (Adone & Maypilama March 2014). A close look at compounds shows the existence of two or three iconic signs in the decomposition of compounds. Two excellent examples are the sign CITY that consists of three signs STONE BUILDING BIG and the sign GET MARRIED that consists of GRAB SILENT GO AWAY. In each example the signs stand next to each other (Kyle & Woll 1985), a phenomenon already observed in the development of other sign languages.

Conclusion

In this paper we set out to discuss the sociolinguistics of alternate sign languages found in Arnhem Land. The alternate sign languages studied here share one sociolinguistic characteristic: they are used by small numbers of people in remote communities. They are all used by hearing and Deaf people. Although we have focused on the sign language used by the hearing people, we find that in many cases these languages are acquired from birth along with the spoken languages, thus making their population bimodal bilingual. Further, these alternate sign languages share some characteristics which might be typically found in Arnhem Land but not exclusively found in alternate sign languages. Further studies are required to establish a clear profile of alternate sign languages.

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The Origins of Alternate Sign Languages in Australia: could they include hearing Impairment?

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Keywords: sign language; Australian Aboriginal; otitis media; hearing loss

Introduction

So-called 'village' sign languages have been widely reported in the scientific literature (not to mention the mass media) (Grace, 1985; Kisch, 2004, 2008). These are (or were) found in a number of communities scattered around the world where the sign language of the deaf is also routinely used by hearing individuals. Such communities are, without exception, culturally or geographically isolated (often practising endogamy) and have a high proportion of profoundly deaf members. The deaf group develops its own sign language and the hearing members acquire mastery of it to varying degrees, using it in particular to communicate with deaf friends and relatives.

Australia appears to be unique, however, in that almost every indigenous community may have had an alternate sign language. This was understood by all the population and used by the majority – a situation which is maintained in some communities to this day. This population, while living in relatively self-contained groups for most of the year, has strong cultural connections over large areas and largely exogamous marriage practices. Factors commonly cited as contributing to the development and maintenance of these systems are both cultural (including ceremonial speech taboos – especially by women in mourning and by young males undergoing initiation – and avoidance behaviour within certain kinship relations) and practical (communicating over distance, while hunting, or with others – the profoundly deaf or the monolingual outsider – who cannot understand spoken language).

But Kendon (1988) points out "some use of signing has been recorded from many parts of Australia, including areas where extended speech taboos have not been reported" and Kwek (1991) writes *"In this particular case [Punmu, Western Australia], it is hard to imagine a set of circumstances that would proscribe normal speech use to the extent of leading to the development of what appears to be a relatively complex sign system."*

The proportion of the indigenous population with severe to profound deafness is somewhat higher than in the mainstream population, but a much higher proportion has a mild-to-moderate conductive hearing loss. In Australia the prevalence of severe hearing loss (60-90 dB) in males aged 15-50 in the general population is around 1.0%, whilst the prevalence of mild-to-moderate loss (20-60 dB) is around 6.7% (Access Economics, 2006). A recent study of 134 Northern Territory (NT) Aboriginal prison inmates (Vanderpoll & Howard, 2012) found that 9.7% of that population had a severe hearing loss (65-90 dB), whereas 85% had a mild-to-moderate loss (25-65 dB). This widespread hearing loss has been largely ignored as a potential factor in the development of Australian indigenous signing.

The Uniqueness of Australian Indigenous Sign Languages

If we look at instances of hearing people using sign in communities across the world, a pattern emerges. Undoubtedly, one of the best known of such communities was Martha's Vineyard in the United States (Grace, 1985), where in the 1880 census the frequency of deafness was as high as 1 in 155 (compared to a national average of 1 in almost 6000). In the Chilmark town of Squibnocket the incidence was as high as 1 in 4 and incomers were obliged to learn the sign language in order to live in the community. In the 20th century as off-island school attendance and exogamy increased, the deaf population waned and the use of signing with it. In the Negev desert many hearing individuals in the 3,500-strong Bedouin Al-Sayyid community use sign language to communicate with about 150 congenitally deaf family members. Al-Sayyid is "an isolated endogamous community with a high incidence of nonsyndromic, genetically recessive, profound prelingual neurosensory deafness." (Sandler, Meir, Padden & Aronoff, 2005). In Bengkala on the island of Bali, a village with "close intermarriage", most of the 2,700 population are fluent in Kata Kolok, the local sign language used by 40 or so congenitally deaf individuals (Branson, Miller, Marsaja & Negara, 1996; Marsaja, 2008). The village of Alipur in India is an endogamous Shia Muslim enclave in an otherwise Hindu area. Many of the 20,000 hearing population are able to use the local sign language to communicate with the 150 or so congenitally deaf members of the community (Panda, 2012). In Adamorobe in eastern Ghana, sign language was used by about 30 deaf and 1,400 hearing people. This community also has an unusually high incidence of genetically recessive deafness, affecting around 2% of the population and possibly a much higher proportion in the past (Nyst, 2007; Kusters, 2012). Pasa kidd is a sign language used by about 2,000 people in the villages around Ban Khor in northeast Thailand, in some of which 1 in 100 people are congenitally deaf (Nonaka, 2004, 2012). Inuit Sign Language is used by both the deaf (about 50 people) and some of the hearing (about 100 people) in Inuit communities in the Canadian Arctic. In this area the incidence of hereditary deafness is reported to be up to six times that in southern Canada (Schuit, 2012). It seems clear these cases all have two key (interconnected) features in common: cultural and/or geographical isolation supporting explicit or de facto endogamy and a high proportion of community members with hereditary sensorineural deafness. The latter are of sufficient critical mass to develop their own sign language and their hearing friends and relatives learn it with varying degrees of proficiency.

The Australian situation, however, is somewhat different. Many indigenous communities in Australia still use sign language as an everyday form of communication and it is probable that such languages existed all over the continent before the time of European contact (Roth, 1897; Strehlow, 1915; Warner, 1937; Mountford, 1938, 1949; Berndt, 1940; Love, 1941). In contrast to the village sign languages discussed above, these are 'alternate' sign languages, which are used by people who also use one or more spoken languages (Kendon, 1988; Wilkins, 1997; Green, 2009). Thus, unlike primary sign languages, Australian sign languages mirror the spoken form to a large extent and may be used in conjunction with it.

There are a number of obvious and oft-quoted situations in traditional Aboriginal society where sign language predominates. The best known of these is ceremonial speech taboo, of which the two main examples are restrictions imposed on widows and female kin in mourning and on young men undergoing initiation. It has also often been observed that signing is commonly used out bush, either as a means of silent communication when hunting, or to complement spoken language between people who are a great distance apart. However, the use of sign in many communities is much more pervasive and much more subtle than these observations would suggest. Kendon (1991) remarks that

> *"although speech taboos may account for the complexity of signing in some areas, this must be understood as but a special elaboration within the context of a more general predisposition to use sign that seems to be widespread in Aboriginal society."* (p.144)

And, according to Green, Woods & Foley (2011), in central Australian communities,

> *"Even in situations where it could be argued that sign is redundant to accompanying speech, it is nevertheless omnipresent. Sign is used in everyday conversation for particular cultural and pragmatic reasons, and a switch to sign may signal the circumspection required of certain topics".* (p.68)

Thus, in these communities anyone may use sign either to complement spoken communication or to replace it when it is socially inappropriate. Naturally, for some hearing impaired individuals in these communities sign is the primary mode of communication. For hearing individuals, sign may be used simply in place of greetings or small talk between friends, but may also be used to show respect or deference in certain social situations. Among such situations identified by Kwek (1991) are initial interactions with strangers (especially before kinship relations have been established), by young people to old people and by shy individuals in general. In Kwek's opinion, signing may perhaps be seen as somehow "off the social record". She has also observed the use of signing to conduct conversations parallel to spoken communication at group meetings. All in all, Kendon's (1988) conclusion is that, while the origins of Aboriginal sign languages may be unclear, the cultural environment of Aboriginal society has facilitated their development and retention:

> *"if people, for whatever reason, resort to signs as a means of communication, if the society they live in conducts interaction in the [Aboriginal] way…the practice of using signs will be favoured, and may spread"*

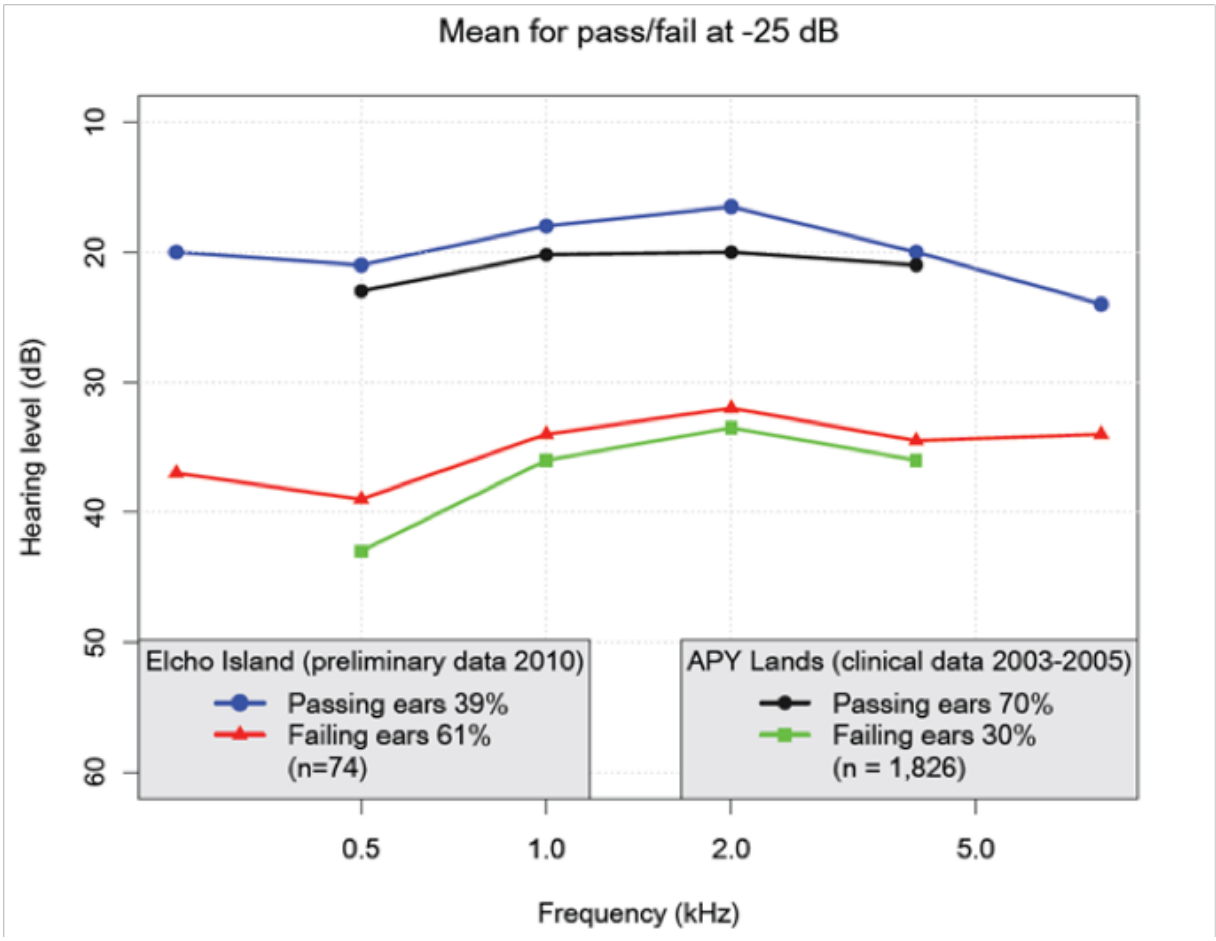
This suggests that Aboriginal culture was already predisposed to accommodate the use of signing and that all that was needed was some kind of trigger to initiate its development. The question then is: what might that trigger have been?

Hearing Impairment in the Australian Aboriginal Population

Within a few weeks of birth the majority of Aboriginal infants develop chronic *otitis media* with effusion (OME). Over the years various studies have found prevalence rates of OME of between 10% and 54% in Aboriginal schoolchildren (Coates, Morris, Leach, & Couzos, 2002). These are by far the highest rates in the world (Acuin 2004, p.14ff), with up to 36% of cases having perforations of the eardrum (Coates et al, 2002). Studies have shown that 50-70% of Aboriginal children have a significant hearing loss (i.e. greater than 25 dB). This compares with 0.26% of the mainstream population under 14 years (Access Economics, 2006). The disease persists throughout childhood and into adolescence and adulthood. It has been estimated that Aboriginal people spend nearly 32 months with middle ear infections between the ages of 2 and 20 years, whereas the equivalent figure for the non-Aboriginal population is 3 months (Couzos, Metcalf & Murray, 2001). Ear infections typically cause a mild or moderate conductive hearing loss, and chronic disease causes chronic (even permanent) hearing loss. This commonly affects both the low frequency end of the scale (under 500 Hz) and the upper end of the scale (above 4000 Hz). Over a period of years, Linnett Sánchez and colleagues measured the hearing of more than 900 children in the Anangu Pitjantjatjara-Yankuntjatjara (APY) Lands of north-western South

Australia (Sánchez et al 2010). Using pure tone audiometry at four frequencies, they found that at a pure tone average threshold of 25 dBHL, 61% of children failed in one or both ears. The mean PTA (pure-tone audiometry) in "failing ears" was 29.6 dBHL. More recently Stoakes, Butcher, Fletcher & Tabain (2011) tested a much smaller group of children (n = 74) at Galiwin'ku on Elcho Island in the Northern Territory, using 6 pure tone frequencies. At a pure tone average threshold of 25 dBHL, 70% of children failed in one or both ears, with a mean PTA in "failing ears" of 35.0 dBHL. The results of these two studies are compared in Figure 1.

Figure 1: *Audiometric data from two Australian Aboriginal population groups: APY Lands = Pitjantjatjara speakers from north-western South Australia; Elcho Island = Yolŋu Matha speakers from Galiwin'ku, Northern Territory*



Source: Stoakes, Butcher, Fletcher & Tabain, 2011

In the course of the NT Emergency Response (aka "The Intervention") from July 2007 to June 2012 over 10,000 children in the Northern Territory were given an "initial health check" and over half of these then received an audiology or ENT (ears, nose and throat) service. Of the latter group, 66.7% were found to have at least one type of middle ear condition and 51.4% had a hearing loss of more than 16 dB (Australian Institute of Health and Welfare, 2012).

It has long been recognised that, because the onset of OM-induced hearing loss occurs in the first two years of life, normal speech and language development may be disrupted (Lowell 1994, 1995; Aithal, Yonovitz & Aithal, 2008; Williams & Jacobs, 2009), leading to significant communication, academic, social and economic life consequences (Stenton, 2003). There is also the possibility of alteration to the temporal properties of synapses and spikes in the auditory cortex, which may contribute to permanent auditory processing deficits (Xu, Kotak

& Sanes, 2007). Clearly mild-to-moderate hearing loss is very widespread in the Aboriginal population, but has it been present for long enough to have been a causal factor in the rise of Aboriginal sign languages?

Evidence for the antiquity of otitis media in Australia

Written and oral accounts

We have no direct evidence relating to the middle-ear health of Aboriginal Australians prior to 1788, but we have at least one contemporary reference to the widespread presence of chronic upper respiratory tract infection at the time of first contact. George Worgan, ship's surgeon with the First Fleet, in his journal for 24 May 1788, calls attention to "the constant Appearance of the excrementitious Matters of the Nose which is collected on the upper Lip, in rich Clusters of dry Bubbles, and is kept up by fresh Drippings" (Worgan 1788/2003, p. 36).

There are also a number of later accounts of first contact with people still leading the nomadic life suggesting widespread chronic ear infection has a long history in Aboriginal Australia. At Ernabella Mission in north-western South Australia, for example, Barbara Sayers (personal communication, 14 Aug 2012) remembers "children coming in out of the desert with no English and no clothes had shocking ears – discharge running halfway down their bodies in some cases". And Hilliard (1968,135) confirms that in the early days at Ernabella "[r]unning ears were still accepted as being normal problems of childhood. Eyes and ears are still major trouble spots, some small children suffering from chronic bad ears, pouring pus, for several years. Occasionally adults continue to be so troubled." Similarly Levitt (1981, p. 54, pp. 143-44, plate 91) comments that on Groote Eylandt "infected ears were common". So common were they in fact that all over Australia various traditional remedies and healing methods evolved. In the Western Desert, for example, "they would pour breast milk into sore ears. Then maggots and pus would come out." (Glass & Hackett, 2003, p. 316). Often the local healer would be called upon: Dobson (2007, p 18) recalls "When I was a child with those very bad ears, deaf as a doornail, the pus and muck running out of my ears, old *mame-mame* Penangke would help heal them".

It seems clear from these accounts that chronic suppurative *otitis media* has been a part of life in Aboriginal Australia for at least the past two-and-a-quarter centuries. Evidence for its presence in the population before this is, however, somewhat scant and indirect.

Paleopathology

Evidence from skeletal remains is, of course, only apparent if the disease in question affects the bone; as most infections involve soft tissue, skeletal residua are comparatively rare. Chronic suppurative *otitis media*, or rather complications arising from it, can potentially give rise to such residua in a number of ways.

One possibility is bone erosion. Moodie (1931, p. 52 and Plate XXXVII) claimed to have found evidence of *otitis media* in pre-Columbian Peruvian mummies, whereby "the external auditory meatus is greatly enlarged by the discharge of pus". A search of the subsequent literature provides no verification of a direct causal link between middle ear discharge and ear canal size. However, chronic negative middle ear pressure and retraction of the tympanic membrane caused by *otitis media* may lead to the keratinisation of epithelial cells (dead skin) in the upper part of the middle ear (epitympanum), forming a mass known as a cholesteatoma. In about 25% of cases, this leads to erosion or absorption of the ossicles of the middle ear – particularly the *incus*. Evidence of such damage in medieval Danish skeletons has been reported by Qvist &

Grøntved (2001). In other cases the mastoid bone in Native American skeletons has been found to be eroded by chronic infection (Gregg & Gregg 1987). Cholesteatomata may also erode through the roof of the middle ear (intracranially), leading to meningitis and brain abscesses (Mann 1992). However, no evidence of such pathology has been reported in Aboriginal skeletons.

A second possible indication is changes in mastoid air cell patterns. The mastoid portion of the temporal bone is diploic (semi-solid) until just before birth and only becomes pneumatised (porous) by subsequent ingrowth of the mucous membrane from the middle ear. The air cell system is usually developed by 4-5 years of age, but pneumatisation continues until the teens. Chronic *otitis media* is known to inhibit this process. Thus Gregg & Gregg (1987) suggest the degree and pattern of pneumatisation visible on mastoid radiographs of Native American skulls not only provide evidence of the presence of *otitis media*, but also give a rough indication as to the point in life at which it occurred. Pneumatic well-formed air cells suggest no adverse effect of *otitis media*; a diploic mastoid bone (with no pneumatisation) suggests inhibition early in life; mixed development suggests the presence of *otitis media* during pneumatisation. There have been no comparable studies of Australian Aboriginal skeletons.

Finally, aural exostoses are sessile (broad based) bony projections in the inner portion of the external auditory canal. These are caused by the retention of fluid in this area, most commonly through failure to dry the ears after swimming or surfing. However, there is also the possibility they may be caused by transudation (seeping) of fluid from an infected middle ear. Roche (1964) states “The etiology of aural exostoses has not been established with certainty. Some, but not all, develop in association with chronic suppurative *otitis media*”. He examined 476 skulls of deceased Aboriginal people obtained from the Murray Black collection. Whilst it is probable that many of these were over 10,000 years old, it was not possible to determine which examples were pre-European contact and which were post-contact. Roche found that 28% of skulls had aural exostoses and concluded “The incidence of exostoses in these Australian aboriginal skulls is the highest that has been reported for any group except the American Indian skulls excavated in Kentucky”.

It is, of course, no longer considered culturally appropriate for such examinations to be carried out. Thus it is unlikely further paleopathological evidence concerning the antiquity of *otitis media* in Aboriginal Australians will be forthcoming.

Evidence for a susceptibility to *otitis media* in Aboriginal Australians

Genetic analysis is a more promising area for the future; although at the time of writing there have been fewer than 40 scientific papers in this area relating to Australian indigenous populations, there are indications this situation is gradually changing (Kowal & Anderson, 2012). It is no longer a matter of debate that a strong genetic component is involved in predisposition to both recurrent acute *otitis media* and chronic *otitis media* with effusion. Whilst the genetics are no doubt complex, with a number of genes contributing to the overall phenotype, there is significant evidence from epidemiological and molecular biological studies that susceptibility to these versions of the disease is largely genetically determined. A major study by Casselbrant and colleagues, for example, followed a cohort of 168 same-sex twin and triplet sets over 5 years (Casselbrant et al, 1999; 2004). They found that after 2 years the estimated heritability of amount of time spent with *otitis media* with effusion was 73% – an effect which attenuated after the 3rd year, but remained significant after 5 years. More recently Hafrén et al (2011) studied 901 subjects with recurrent acute *otitis media* and 559 with chronic *otitis media* with effusion. Their heritability estimates were 38.5% for the recurrent form of the disease, 22.1% for the chronic form and 47.8% for *otitis media* of any kind.

Genetic mutations (single-nucleotide polymorphisms or SNPs) implicated in *otitis media* have been identified in a number of human genes. The strongest candidate to date is probably the F-box gene FBXO11, located on chromosome 2 (Hardisty-Hughes et al, 2006; Tateossian et al, 2009), which is expressed in middle ear basal epithelial cells in late embryonic stages and early infancy, when inflammatory changes are under way. The association of FBXO11 mutations with severe *otitis media* has subsequently been confirmed by Rye et al (2011), using family-based association testing in an analysis of 434 families (561 affected individuals) from the Western Australian Family Study of *otitis media*. The association was replicated by directed analysis of data for a further 253 cases and 866 controls from the Western Australian Pregnancy Cohort Study. More recently in a genome-wide association study Allen et al (2013) genotyped 602 subjects from 143 families with 373 *otitis media* subjects and replicated an association with chromosome 2, but at a different gene location. This and other similar studies (e.g. Casselbrant et al 2009), have also identified a number of other possible candidates. To date no such studies have been carried out on Australian Aboriginal subjects.

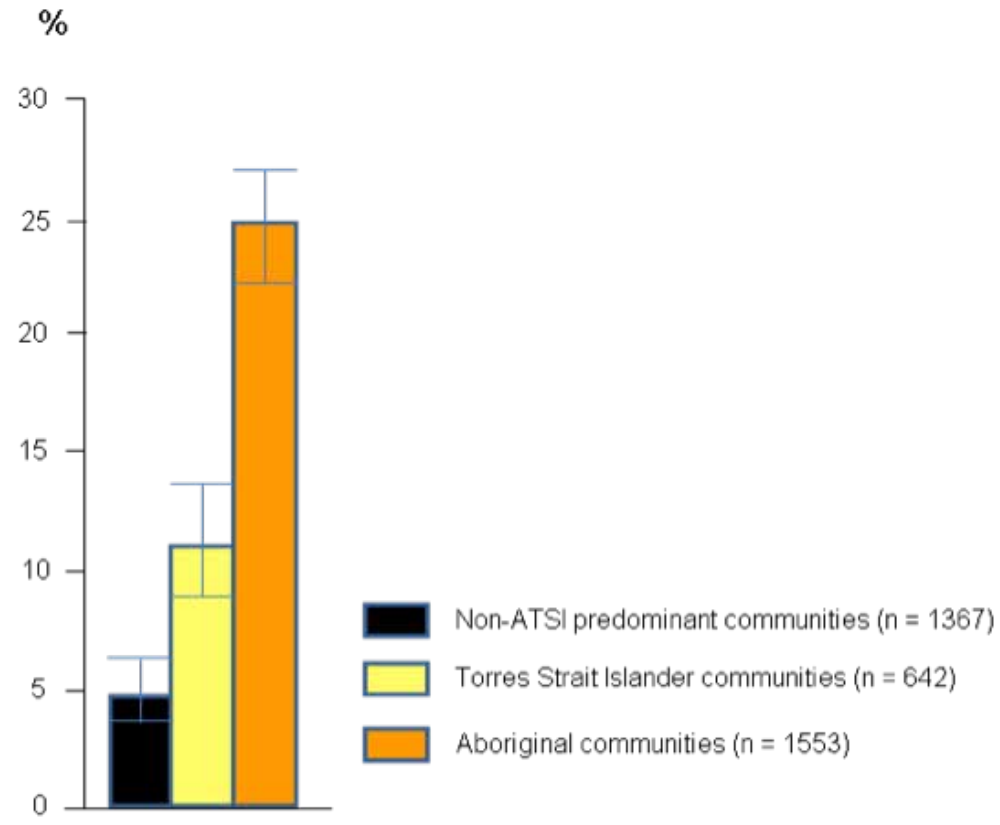
As McEvoy et al (2010) put it: "Australia has been the subject of relatively few DNA studies even though understanding regional variation in genomic structure and diversity will be important if disease-association mapping methods are to be successfully evaluated and applied across populations." A small number of studies have analysed the genetic affiliations and possible migration history of the Australian Aboriginal population and reached conflicting conclusions. In one of the first such studies, Roychoudhury (1984) used gene frequency data to investigate the possibility of a genetic relationship between southern Indian and Sri Lankan tribes and the aboriginal populations of Malaya, New Guinea and Australia. He found "no… evidence to suggest that Indian tribes and Australian Aboriginals are biologically related". Redd and colleagues (Redd & Stoneking 1999; Redd et al 2002) studied nucleotide variation in mt (mitochondrial) DNA and also SNPs and STRs (short tandem repeats) on the Y chromosome. Their results separate PNG highland and Aboriginal Australian populations (about 40,000 years ago) and link Aboriginal Australian populations with populations from the subcontinent of India, suggesting a more recent wave of migration (less than 4,000 years ago).

Subsequent work has presented evidence against such a link and suggested Australia was populated by a single wave of migration. Hudjashov et al (2007) analysed mtDNA and Y chromosome variation in Aboriginal Australians and Melanesians and compared the resulting profiles with global data, concluding all Australian lineages fell within the mitochondrial founder branches associated with the exodus of modern humans from Africa 50–70,000 years ago. They detected only minor secondary gene flow into Australia, which could have taken place before the land bridge between Australia and New Guinea was submerged 8,000 years ago. Kumar et al (2009) sequenced 966-mitochondrial genomes from 26 relic tribes of India and claimed to show a shared mtDNA lineage between Indians and Australian Aborigines providing direct genetic evidence of "an early colonization of Australia through south Asia, following the 'southern route'". In a genome-wide investigation of Australian Aboriginal SNP diversity in a sample of participants from the Riverina region McEvoy et al (2010) found that, whereas there was a deep common origin with Papuan New Guineans and Melanesians, there was little evidence of substantial later migration until the very recent arrival of European colonists. This conclusion was supported by Rasmussen et al (2011), who sequenced a genome obtained from a 100-year-old lock of hair from an Aboriginal man from Western Australia. They claimed to show the ancestors of present-day Aboriginal Australians migrated into eastern Asia 62,000 to 75,000 years ago and the Australian genome clustered together with those of Highland PNG and Bougainville, with the next closest populations being the Munda speakers of India and the Aeta from the Philippines.

On the other hand, a more recent study by Pugach et al (2013) has revived the idea of multiple migrations. In an analysis of large-scale genotyping data, they found "an ancient association between Australia, New Guinea, and the Mamanwa (a Negrito group from the Philippines), with divergence times for these groups estimated at 36,000 years ago, … supporting the view that these populations represent the descendants of an early "southern route" migration out of Africa", but they also detected indications of "substantial gene flow between the Indian populations and Australia" estimated to have occurred some 4,000 years ago. In this connection, it is interesting to note the prevalence of chronic *otitis media* in southern India is second only to that found in Aboriginal Australians (Acuin 2004). To quote McEvoy et al (2010) once more, "A broader survey of Australia, including diverse geographic sample populations, will be required to fully appreciate the continent's unique population history and consequent genetic heritage, as well as the importance of both to the understanding of health issues."

What is lacking to date is a convergence of the above two approaches in the form of a scientific study of a possible genetic susceptibility to *otitis media* amongst the Australian Aboriginal population. There is only one published account which compares the prevalence of chronic *otitis media* in different population groups within Australia. Rothstein, Heazlewood & Fraser (2007) compared data from communities in Far North Queensland whose populations were predominantly Aboriginal, Torres Strait Islander or European (3562 children in all). The prevalence rates amongst children seen by the paediatric outreach service are shown in Figure 2. If the figures for Aboriginal children and Islander children are extrapolated to the entire population (based on 2001 census data), then the prevalences for these two groups are 14.7% and 2.9% respectively – a clear indication the Aboriginal population is far more susceptible to the disease than either of the other two groups.

Figure 2: *Proportion of children with chronic suppuratives otitis media by population group in remote communities in Far North Queensland*



Source: Rothstein, Heazlewood & Fraser, 2007

The possibility of a connection

The most common reason (usually the only one) for the development of a sign language is hearing impairment in the population in question. The sign language situation in Australia is unique in that (1) sign languages probably developed amongst the entire population of the continent and (2) these sign languages were all of the alternate type – i.e. evolved to complement spoken language rather than replace it. But the Australian Aboriginal population is also unique in that it currently has the highest prevalence of *otitis media* and mild-to-moderate hearing loss in the world. If this is the result of a genetically determined susceptibility, then it may be of considerable antiquity. We have argued elsewhere (Butcher, 2006; Butcher, Stoakes, Fletcher & Tabain, 2012) that the fact that the majority of this population has a different hearing profile from most of the rest of the world may account for the development of sound systems in Aboriginal languages which are different from most of the rest of the world. It is not inconceivable that alternate sign languages in Australia may have emerged for the same reason. If the majority of a given population have a mild-to-moderate hearing impairment, then it seems reasonable to surmise that they might develop an alternate sign system (as well as acoustically appropriate sound systems) in order to optimise their communication. The reason this has not happened in other parts of the world would be that there is no 'differently hearing' population of this size elsewhere in the world.

Summary, Conclusions and Implications

A number of hearing communities around the world have developed sign languages. These are without exception isolated communities with a significant minority of congenitally profoundly deaf members. The Australian Aboriginal population is unique in that it has developed alternate sign systems which are available for use by the whole community in a wide variety of social situations, possibly throughout the continent. The Australian Aboriginal population is also unique in that the majority of its members have suffered from chronic *otitis media* in childhood, which has led to a different hearing profile from most of the rest of the world's population. The antiquity of this situation is unknown but the possibility exists that it may even date back to the most recent migration of 4,000 B.P.; recorded observations suggest the widespread occurrence of upper respiratory tract infection since the very first days of European contact; limited paleopathological evidence reveals a high level of what may be *otitis media* residua in a heterogeneous sample of uncertain antiquity; epidemiological and molecular biological research show heritability estimates for susceptibility to *otitis media* ranging from 40 to 70%. However, the majority of genes underlying this susceptibility are, as yet, unidentified and none have been studied in the Aboriginal population. Some of the limited research on Aboriginal genomics has indicated a possible connection with populations of southern India, where currently the prevalence of *otitis media* is the second highest in the world. One recent survey has shown that the prevalence in Aboriginal communities is double that in Torres Strait Islander communities and five times that in European communities.

Thus the Aboriginal population of Australia may well have a genetic susceptibility to *otitis media*. It seems certain that generations of Aboriginal people have had mild-to-moderate conductive hearing loss and therefore hear somewhat differently from the majority of the world's population. This may be what has led to (1) the evolution of unique sound systems to maximally exploit this different hearing profile, and (2) the evolution of unique alternate sign languages to augment oral communication. One possible scenario is that this situation already existed more than 4,000 years ago in southern India and that a section of the population migrated to Australia, bringing with them their dogs, their susceptibility to *otitis media*, their phonologies, and their alternate sign languages.

In terms of investigating these possibilities further, one promising avenue would be to extend the search for *otitis media* susceptibility genes to the Aboriginal population. It would be interesting to know, for example, whether the prevalence of mutations on the FBOX11 gene is higher amongst the Aboriginal population than amongst non-Aboriginal Australians. It would also be of interest to look for evidence of alternate sign language use amongst the populations of southern India, particularly those most affected by *otitis media*. Most importantly of all, however, it is vitally important to document, maintain and possibly revive the sign languages of Aboriginal Australia. For by teaching Aboriginal children only in English, by paying only lip service to their traditional languages and ignoring their sign languages altogether, we may be depriving them of a form of communication which is most appropriate for their hearing profile – i.e. an oral language with a sound system optimally attuned to the typical hearing curve of an *otitis media* sufferer and a sign language which complements their oral language.

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Making an online dictionary for Central Australian sign languages

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Introduction

In Central Australia, sign languages are used alongside speech, gesture and other semiotic systems such as sand drawing. These sign languages have been described as 'alternate', as they are not generally the primary mode of communication in these communities but rather used instead of speech in particular cultural circumstances (Green & Wilkins, 2014; Kendon, 1988 [2013]). In this paper we discuss a sign language documentation and online resource development project for Indigenous sign languages from Central Australia. In particular we track our workflow, from sign recording sessions through to the publication of selected video clips of sign in an online sign language dictionary (www.iltyemiltyem.com). This project represents the first comprehensive attempt to document sign language knowledge in the Central Australian region since Kendon's research in the 1980s, and his in-depth analysis of the sign languages found in some Central Australian communities provides a foundation for the current research (Kendon, 1988 [2013]).

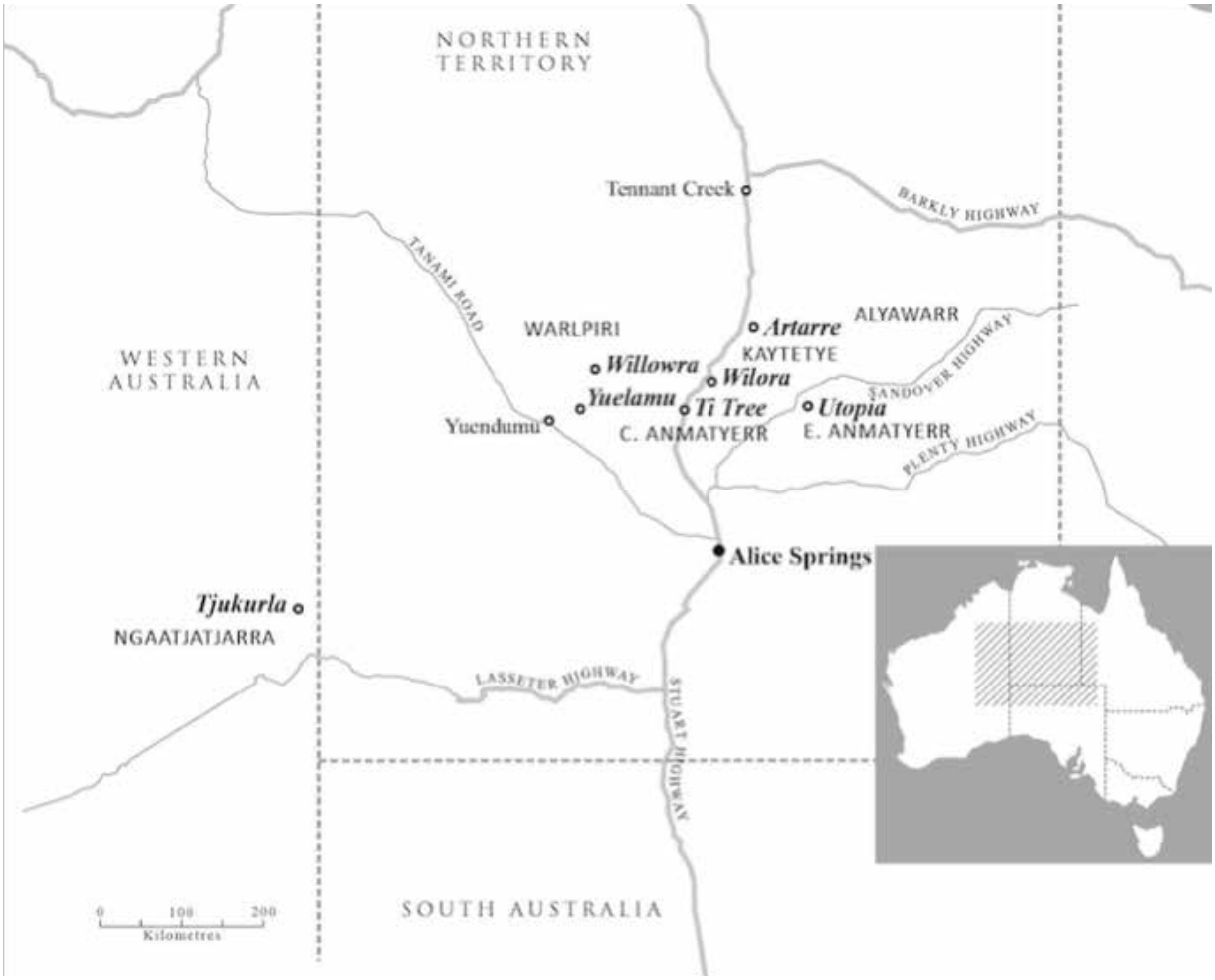
The various requirements of media publishing in environments typical of remote Central Australia has led to a divergent workflow that has two distinct paths – one that is primarily a film editing workflow and the other more suited to presenting media and metadata online. Working in a multilingual and multimodal environment also presents particular challenges for the design of sign language corpora and resources. Attention to workflow design enables multiple outcomes from language documentation – materials presented through a range of media, resources relevant to academic and community audiences, curated archival data sets and a refined corpus that enables further research.

The web-based dictionary project is titled *Iltyem-iltyem*, an Anmatyerr term meaning 'signaling with hands, using handsigns'. The key purpose of *Iltyem-iltyem* is to support the maintenance, teaching and learning of sign languages in Central Australia by providing an accessible and contemporary online media resource. We aimed to create a media product using tools that are open-source, widely used, aesthetically pleasing and 'pertinent' (Nathan, 2006) to a community audience. A related aim was to design the dictionary so it could be used by sign and gesture researchers. The online repository of signs provides a refined and growing corpus that is searchable on several parameters. Corpus and workflow design providing for multiple uses of data is consistent with best practice in language documentation work. As stated by Thieberger (2011, p. 463), "we now take it for granted that all documentation should include a media corpus, that various data sources can be made to work together, and that outcomes of linguistic work be created in an archival form with derived forms for presentation". Although archiving and future access to preservation copies of media and metadata is a central concern, in this paper we focus on our solutions for deriving web-site posts from complex sign data sets. We have found a linear workflow cannot account for the multiple uses of the sign video data. Rather, a divergent workflow with two distinct paths meets the multiple needs identified in our workflow design.

The project was designed as a language documentation and publishing partnership between signers and speakers of Indigenous languages, linguists and multi-media designers. The working practices of the project team were established in collaboration with local leaders and structured around mentoring relationships within a skilled and culturally diverse group. This involved the development and testing of a prototype website, raising awareness of issues involved in internet publishing via a project blog[1] and ongoing review and consultation over the use and archiving of recorded material.

A group of Anmatyerr and Warlpiri speaker/signers from Ti Tree, 200 km north of Alice Springs, and Ngaatjatjarra speaker/signer Elizabeth Marrkilyi Ellis from Tjukurla in the Western Desert region participated in the early stages of the project. The project has also recorded sign at Wilora (Stirling), Artarre (Neutral Junction), Yuelamu (Mt Allan) and Utopia, and the website is currently being expanded with contributions from these communities. Many of the participants from these communities have long-standing experience working on education, training and language documentation projects over many years (Green, 2003, 2010). Figure 1 shows the locations of communities involved in *Iltyem-iltyem* and the languages spoken there.

Figure 1: *Map of Central Australia, showing main languages (in capitals) and names of communities (in bold italics) involved in the Iltyem-iltyem project*



1. The blog appears on the front page of the *Iltyem-iltyem* website (http://iltyemiltyem.com). For a discussion of this as a form of digital outreach in language documentation, see Gawne (2015)

The website was designed to add to the considerable suite of language learning resources already developed for Indigenous communities in Central Australia by articulating with the semantic domains and graphics used in the IAD Press Picture Dictionary Series (see Green, 2003). The site was launched in Alice Springs in September 2013 and it contains close to 400 clips available for public view by registered users, who can browse and search across a range of categories.

Janie Pwerrerl Long,[2] a member of the Ti Tree team, has asserted the importance of sign documentation work in terms of both language maintenance and the need for suitable resources for teaching and learning sign:

> *Anwern mpwarem iltyem-iltyemel arelh mapel akwer maparl akalty-irretyek. Website-warn anwern arrernem. If inang website altywer-ilem, ina can arerl iltyem-iltyem nthakenh apek. Anwerneh akalty-anthek iltyem-iltyemek angerr-pat mapel – anwernek imperl-alhek. Anengkerrant alkenty ina rrkwek angerr-pat mapel ant hand-em over-ilerlapetyart, passing on anwernek. Lyet anwern want-em-irrem akwerek pass-em on-irretyek. We want to website-warn arrernerl anwern-kenh angkety so they can iltyem-iltyem yanhek akalty-irrerl.*
>
> *All of us women are working on the sign project so that the children can learn. We are putting the signs on a website. If they open the site then they'll be able to see how signs are done. The elders taught us sign language – they handed it down to us. They held that knowledge from the Dreaming and they handed it over and passed it on to us. Now we want to pass it on to our children. We want to put our language on the web so that the children can learn sign language (Janie Pwerrerl Long, Hanson River, 29 June 2011).*

Considerations in website design

There are a number of technical and cultural considerations related to the appearance of the website and its functionality as a community resource. A key consideration is that the website should suit the corpus and reflect the multimodality of the recordings. It is also essential to validate regional linguistic identities and to respect cultural norms and protocols. Another important consideration is the curation and archiving of recorded material and its associated metadata. In addition, the design of the website and project workflow needed to reflect the constraints imposed by limited internet download speeds in remote communities in Central Australia. We discuss each of these considerations briefly below, before returning to outline the workflow, from sign recording to the posting of selected sign clips on the website.

Some features of our sign corpus reflect the complex communication ecologies of the desert regions, and they have theoretical implications as well as presenting practical challenges. Multimodal utterances – composites of sign and speech – are typical of many communicative contexts in these language communities (Green & Wilkins, 2014; Green, Woods, & Foley, 2011; Kendon, 1988 [2013]). To date, the focus has been on recording sign knowledge from hearing signers,[3] and consequently the majority of the recordings are sign/speech composites which

2. Janie Long Pwerrerl is the daughter of Lucky Long Peltharr, one of the Anmatyerr women at Ti Tree with whom Kendon worked on sign documentation in the 1980s.

3. We are yet to conduct studies of the ways that deaf individuals in the region acquire and use sign, although there is some anecdotal evidence that some traditional sign is used by Indigenous deaf with each other and with hearing members of their communities (see Adone & Maypilama, 2012, 2014; Bauer, 2012, 2014; Cooke & Adone, 1994; Maypilama & Adone, 2013; O'Reilly, 2006; Power, 2013).

include a range of spoken languages: Anmatyerr, Kaytetye, Alyawarr, Warlpiri and Ngaatjatjarra. The online resource is designed to present both speech and sign in selections of audio-visual recordings of signers from across this range of language groups. Elicitation of sign was conducted in the spoken languages of the communities. In the annotation and analysis of sign language recordings, we have thus identified the basic communicative unit as a 'sign utterance' comprising one or more signs, and with or without accompanying speech.

The second issue relating to website design centers around challenges inherent in making a set of community resources that have coherence in terms of local language identities and affiliations. From the perspective of the signers regional variations in sign 'identity' are based on a complex set of factors, but predominantly on the variety of speech (if used) of the signer and hence on their language and cultural identity. So, for example, an Alyawarr or a Kaytetye person may employ identical signs in most domains, yet speak distinct languages and belong to particular geographical areas within Central Australia. We identify instances of language-specific sign production – for example Alyawarr sign, Kaytetye sign, or Warlpiri sign – even though the sign systems used in some regions of Central Australia are essentially the same, apart from minor lexical differences (Kendon, 1988 [2013]).[4] As many Indigenous people in these communities are multilingual, it is also common for a particular signer to use sign in communicative contexts where one or another of several spoken languages predominate. A sign/speech composite thus may consist of a sign that is shared across the Central desert region, but coupled with regional and community specific varieties of speech – either one of the Arandic languages or one of the neighbouring languages such as Warlpiri. Both of these issues have important consequences for the implementation of a practical system for identifying particular signs - their 'Sign IDs', and for the ways sign lexemes are represented on the website. We will return to the problem of Sign IDs below.

We designed a project workflow to select and extract sign utterances from longer recordings, and to label individual signs within sign utterances, thus making the online resource searchable for these individual signs. Given the predominance of both speech and sign in sign utterances, we needed to display information about both in sign utterance clips. These issues have consequences for the treatment of the media and metadata throughout the annotation and online content building workflow.

Internet download speed was a technical constraint for the website design. Speed testing of an early prototype of the website at Ti Tree community in early 2012 helped to establish compression parameters for online video.[5] We found that extremely slow internet speeds at Ti Tree (and in Alice Springs) resulted in a significant lag in playing video, even clips of only several seconds duration. Vimeo and similar video hosting services are designed for faster Internet speeds than are currently available in Central Australia. Instead of external hosting, the project now hosts its own video files.

Workflow design

A key challenge for the online project was to design a workflow which identifies suitable sign utterances from longer video recordings and then extracts them and their associated metadata

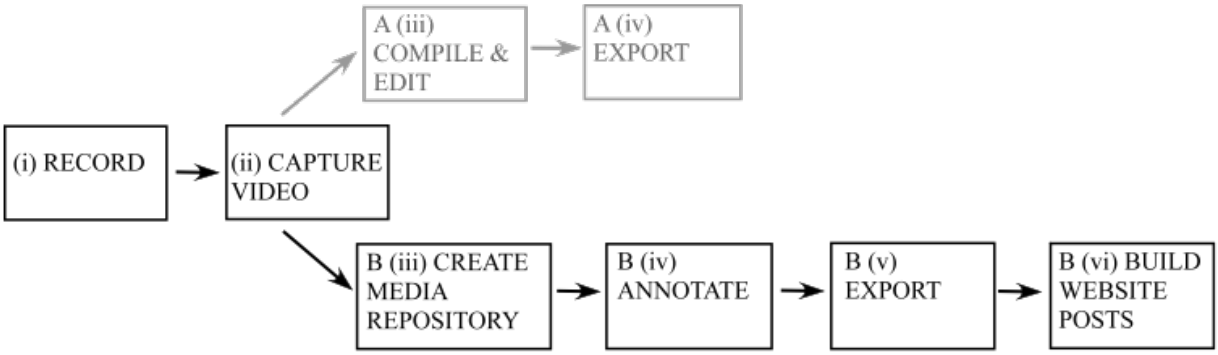
4. There are differences in "sign language development and use" between sign systems used by Anmatyerr, Kaytetye, Alyawarr, and Warlpiri people in the Central region, and those found in the Western Desert (an area fanning out from the tri-state border of Western Australia, South Australia and the Northern Territory) (Kendon, 1988 [2013], p. 53-54). The *Iltyem-iltyem* website includes some examples of Ngaatjatjarra sign, but further research is needed to explore these differences.

5. Internet speed testing was conducted via http://www.speedtest.net in 2012. Testing of the Ti Tree School Internet showed the speed was slower than 85% of the rest of Australia. At that time, the speed over a Telstra Next-G mobile device used at Ti Tree was slower than 65% of the rest of Australia.

for presentation on the website. There are two main approaches to undertaking this. The first is to select relevant sections in a media file by start and end time codes and then call them up as 'snippets' (e.g. by HTML 5), and stream them from a host server which holds a repository of archival files, which remain intact. The alternative is to create 'clips' – a suite of secondary files that are then presented as independent items. Clips are small and more manageable for media streaming, especially over slow internet connections. This was the approach we chose for this project, even though creating clips can potentially lead to data management problems by replicating media and creating secondary files.[6] Although perhaps not regarded as best practice in language documentation (Thieberger, 2011), we found it to be appropriate in this context given the limits on internet speed (cf. Bowden & Hajek, 2006). Managing the large number of secondary files requires a workflow design that maintains provenance between archived media and the clips created for online publication. Our management strategy combined the potentials of the annotation software ELAN[7] (Crasborn & Sloetjes, 2008) with the media production tools Ffmpeg and Wordpress.

We have identified a number of stages in processing the sign language media and metadata. Figure 2 shows how the project workflow takes divergent paths after the video capture stage (ii). These paths have different outputs: path A is an editing workflow, in which media files are compiled and edited using proprietary media compilation software to make films for various purposes. Path B is a workflow for creating sets of preservation files and for selecting media to present online on the *Iltyem-iltyem* website. In the following discussion we focus on path B, which comprises the following stages: (i) Record, (ii) Capture video, (iii) Create media repository, (iv) Annotate, (v) Export and (vi) Build website posts.

Figure 2: *The Iltyem-iltyem project workflow*



We illustrate our workflow by tracking one sign utterance from elicitation and recording, through to annotation, and finally to presentation on the website. This sign utterance can be viewed online at: http://iltyemiltyem.com/sign/anmatyerr/kwaty-2/.[8] Henceforth we refer to this clip as the KWATY/WATER example.

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6. For a discussion of issues about the presentation of audio and video snippets or clips in academic publications see http://listserv.linguistlist.org/cgi-bin/wa?A2=ind1303&L=RESOURCE-NETWORK-LINGUISTIC-DIVERSITY&F=&S=&P=3335.

7. ELAN is downloadable from http://tla.mpi.nl/tools/tla-tools/elan/.

8. To access this example, viewers are required to register to enter the dictionary component of the *Iltyem-iltyem* website.

(i) Record

The recording sessions follow a methodology outlined previously (Green et al., 2011), which attempts to adapt some of the conventions used in primary sign language recording to remote conditions. This has resulted in sign recordings that are consistent in terms of the lighting and positioning of the signers: for example signers are generally filmed seated in front of a blue background with the figure of the signer prominent in the frame.

The sessions involved structured elicitation in local spoken languages, based around the semantic categories used in the Picture Dictionary series, and alongside more spontaneous explorations of particular signs. Green initially led elicitation, but as the team's familiarity and confidence grew, the sessions became more collaborative. Typically this involved senior women sitting alongside Green and offering both spoken and signed prompts and coaching for those being filmed. This provided a learning opportunity for those who approached the task with low confidence – possibly due to lack of knowledge of sign but also unfamiliarity with the role of a language consultant. The sessions were greatly enriched by the multilingual capabilities of senior members of the project team.

We turn now to the featured sign utterance, the KWATY/WATER example. Figure 3 is a still taken from a video of a recording session in which this particular sign featured.

Figure 3: *KWATY/WATER video still*

Source: http://iltyemiltyem.com/sign/anmatyerr/kwaty-2/

The KWATY/WATER post on the website comes from a video recording made on 30 June 2011 at Ti Tree community. It is one of four different sessions filmed on that day. Each involved a team of Anmatyerr and Warlpiri women who took turns to demonstrate the signs on camera. This particular recording contains 38 sign utterances and a total of 32 unique lexical signs.[9] The signs span a number of semantic categories: kinship, person types, food, motion and feelings. Like most sign utterances in the corpus, they include speech as well as sign and gesture. The recording also contains elicitation prompts and requests for clarification from the signer. This diverse profile is typical of the recordings found throughout the corpus.

9. Session name: SIGN-20110630-0

(ii) Capture video

Video recordings are captured from the camera using Final Cut Pro X software (FCPX). This creates folders of high-resolution video files, which we refer to as 'primary video files'. As FCPX captures files from the camera, it compiles them into folders called 'Events'. We then re-name the media in the Events folders according to the protocols established for the project. These names identify files by date and session, and remain constant for all associated files derived from the primary media – for example the .wav and .mp4 files used in annotation, and the ELAN annotation files themselves. Establishing consistent file naming practices from the start is essential for efficient management of complex sets of media (Johnson, 2004, p.148-49).

FCPX can be used to compile and edit short films from primary files, following Path A illustrated in Figure 2. In this project, we frequently edit sign material into short films and publish them to DVD or place them onto USB devices, to ensure community members receive copies of highlights from their recording sessions soon after they occur. These are also used as consultation tools to contextualise discussions about online publishing and other uses of recorded sign language material. For some communities, where there is little or no internet access, DVD or USB based copies of sign recordings may be the only feasible way to provide copies of sign recordings. Primary files can be retained in the FCPX Events folder and in the capture format if future video editing is anticipated, but they are not in a suitable preservation format for archiving.

(iii) Create media repository

The project's media repository is large, consisting of multiple files from approximately 100 recording sessions conducted between 2011 and 2015. Creating the media repository involves preparing media by transcoding it from the primary files in the FCPX events folder to appropriate formats for archiving, annotation and online delivery. This creates two other video file types – 'preservation' files and 'access' files. The distinctions between these types of files are based on the optimal formats for different uses of video files. The preservation set are unedited files in a suitable high-resolution format. The access files are smaller and suitable for both annotation and online delivery of media. A summary of video file types and their uses are presented in Table 1.

Table 1: *Summary of video file types and formats used in the Iltyem-iltyem project.*

Workflow	***Capture and editing***	***Annotation and online delivery***	
Storage location	FCPX Events folder	Project media repository	
File type	Primary	Preservation	Access
Purpose	Video editing	Long term archival deposit	Annotation in ELAN
Outputs to	Compiled and edited films	Unedited video files	Export as clips for website
Format	High quality Compression: Apple ProRes Wrapper: Quicktime (.mo)	Highest quality MPEG-2 or MPEG-4	Lower quality Compression: H.264 Wrapper: mp4[10]

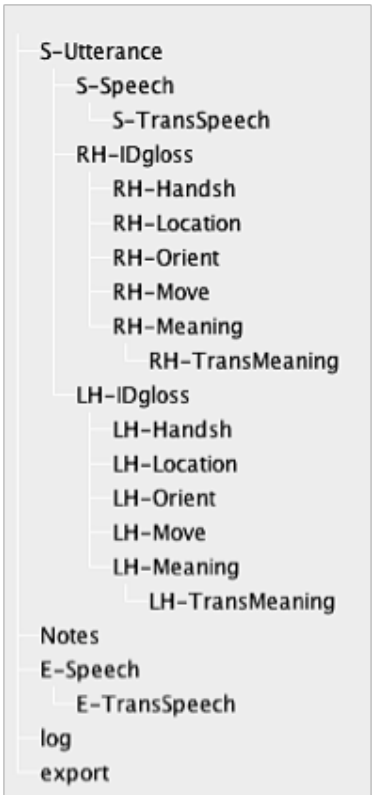
10. H.264/mp4 access files are scaled to the following parameters: frame size: 640x360 pixels; audio: 44.1 kHz; frame rate: 25fps; data rate: limited to 8000 Kbps.

(iv) Annotation

We now describe how project files are annotated and how clips are derived from these annotations. The software ELAN is used, and clips destined for the *Iltyem-iltyem* website are exported, along with their metadata, directly from ELAN. We use a multi-tiered ELAN template first developed by Green et al (Green et al., 2011) and informed by guidelines developed for the annotation of corpora of primary sign languages such as Auslan (see Johnston, 2014). Annotations of varying degrees of granularity ¬– chunking sign utterances, transcribing co-signing speech, and identifying individual signs and the distinguishing features of signs, such as handshape, hand position and orientation, and hand movement – are time-aligned with their video media.[11]

Figure 4 shows the ELAN tier hierarchy of the *Iltyem-iltyem* project's annotation template. The top level of the tier hierarchy, called S-Utterance, marks a composite unit of sign and speech. The S-Utterance tier is the parent of a set of analysis tiers, such as RH-IDgloss, LH-IDgloss (where sign identification labels for signs made with the right and left hand are noted) and S-Speech which is a transcript of the co-signing speech if it occurs. As discussed by Johnston (2010:125) the optimal number of annotation tiers for sign language corpora is "yet to be determined" and is very much a matter of "trial and error".[12]

Figure 4: *ELAN annotation template used for the Iltyem-iltyem project*



11. At this stage we have not annotated any non-manual features of the signs in the corpus. In general facial expression, eye-gaze and posture-shift have no formal position in the system of signs, and only play a role at the discourse level (Kendon [1988] 2013, p. 113). However, it may be the case that Indigenous signers who have had exposure to other sign languages such as Auslan use mouthings and other facial expressions alongside manual signs.

12. Johnston (2014, p. 9) notes of the 60 or so tiers used in the standard ELAN template for the Auslan corpus that "most tiers have yet to have any annotations entered in them for the vast majority of video files".

Annotation is undertaken in a series of passes (Johnston, 2010, p. 116), initially segmenting the video footage into sign utterances, then proceeding to assign sign ID glosses, transcribe associated speech and develop free translations. Over time, continuing work on annotation and transcription of the corpus will enable searchability and recognition of patterns through the examination of large data sets. This will increase its value as a research tool to further explore various aspects of Central Australian sign languages. Although the ELAN template for this project allows for more detailed annotation of sign forms, in the initial stages the objective was to prepare as many sign examples as possible for export to the website.

There are a number of challenges inherent in consistently and uniquely applying sign identification labeling. Ideally, a reference lexical database such as the Auslan Signbank is needed to do this effectively. Johnston (2010, p.23) suggests that the creation of a corpus without such a lexical database is "unlikely to succeed". In the *Iltyem-iltyem* project, sign identification labels are developed heuristically throughout the annotation and analysis process. For the on-line dictionary, signs are labeled with a 'Sign ID' comprising a gloss (in the spoken language of the signer) and an English equivalent. This iterative process inevitably leads to revisions to the schema as the searchable corpus grows, and as new signs and variations to well known ones are identified.

The prevalence of sign polysemy poses particular problems in assigning unique Sign IDs. For example, in Central Australian Indigenous languages a range of kin terms is lexically differentiated in speech, yet there are less kin signs than spoken kin terms. An example is the sign for Anmatyerr spoken kin terms: *angey* 'father, father's brother', *awenh* 'father's sister', and aler 'man's child, a person's brother's child'. Each of these kin terms is signed the same way: a horizontally extended index finger taps the chin. A related situation exists for many flora and fauna terms where a single sign refers to more general categories or taxonomic groupings. In such instances, co-signing speech often serves to disambiguate what is being referred to in sign. In these circumstances, the question arises as to whether to identify the unique sign form with one Sign ID label and then describe the multiple meanings that occur in context, or alternatively to identify them individually as sign form/referent complexes.[13]

For the purposes of the *Iltyem-iltyem* website, Sign IDs comprise two parts – the first based on a speech equivalent from the spoken language of the community, and the second an English gloss that approximates the meaning of the sign. Table 2 illustrates this with Sign IDs for 'water' taken from four different speech communities. Four Sign IDs correspond to three distinct sign forms. The Anmatyerr Sign ID for the sample clip is KWATY/WATER, as *kwaty* is the Anmatyerr speech term for water. The Warlpiri Sign ID equivalent for KWATY/WATER is NGAPA/WATER, ngapa being Warlpiri for water. Warlpiri and Anmatyerr speakers sign WATER in the same way. In the Kaytetye language, *arntwe* 'water' leads to a Sign ID ARNTWE/WATER, and the sign is formed by using a flat hand articulating with the upper chest. In Ngaatjatjarra, the corresponding Sign ID is KAPI/WATER, and the sign is formed with a flat hand that touches the contralateral then the ipsilateral upper chest.[14]

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13. For a discussion of the determination of sign homonyms in Auslan see Johnston (2010, p. 124). A single sign form will be given a separate sign ID gloss if meanings are "completely distinct and unrelated".

14. Anmatyerr signers may employ both the rotated fist and the flat hand forms to sign KWATY/WATER. This variation may be understood as dialectal or language-specific variation. Alternatively there are two signs for water that may encode semantic distinctions that are not immediately apparent.

Table 2: *Sign IDs and sign forms for WATER in Anmatyerr, Warlpiri, Kaytetye, and Ngaatjatjarra*

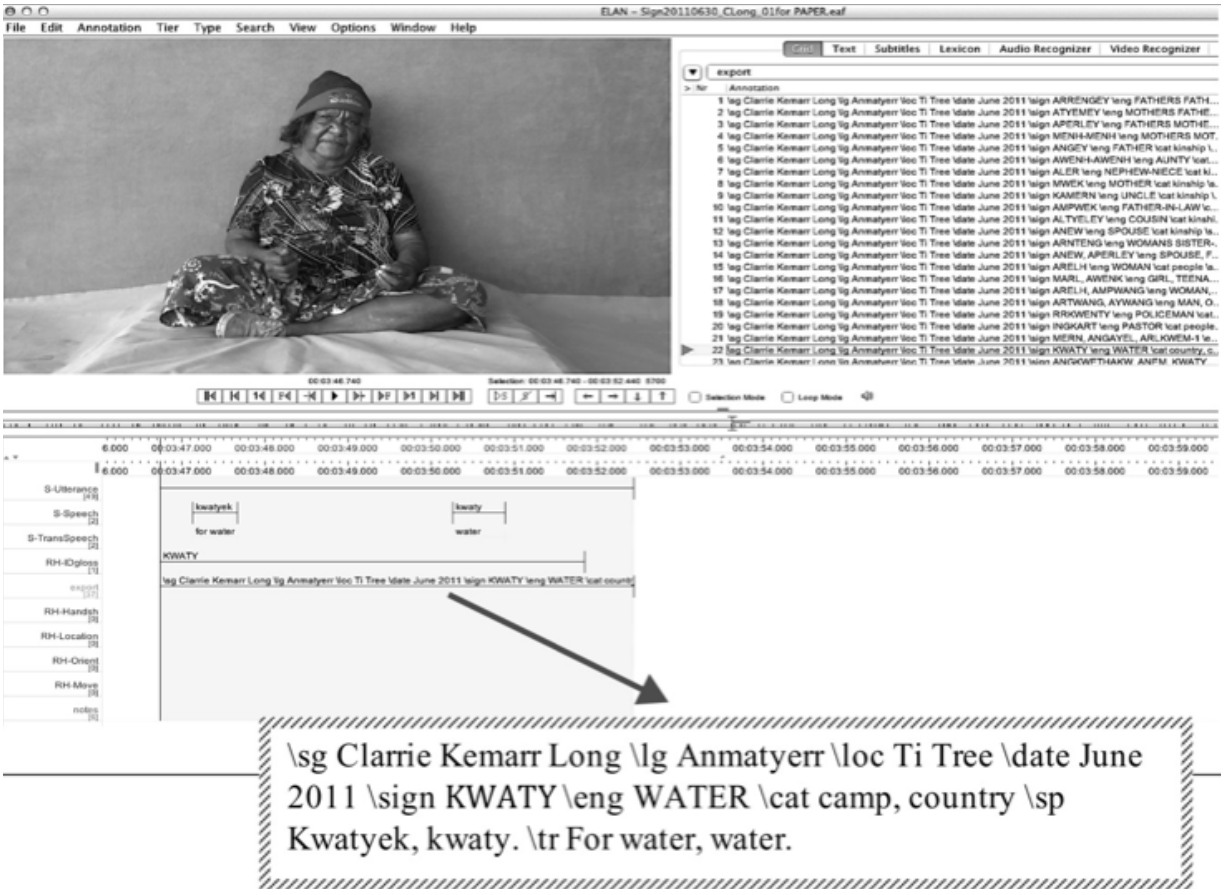
Language	Handshape	Description	Sign ID
Anmatyerr		Fist with thumb upwards is rotated rapidly several times	KWATY/WATER
Warlpiri			NGAPA/WATER
Kaytetye		Flat hand articulates with upper chest	ARNTWE/WATER
Ngaatjatjarra		Flat hand touches contralateral then ipsilateral upper chest	KAPI/WATER

Although sign forms could be given a unique and abstract value,[15] it is important to present sign glosses on the website in a way that is not overloaded with technical language and linguistic or abstract information. This enables intuitive searching of the website using English words and Indigenous language words. As our annotation of sign data is an on-going process, analysis of sign polysemies and preparation of clips for the website proceeds hand in hand.

For sign utterances selected for use on the website, a separate ELAN tier called 'export' is employed (see Figure 4). Metadata for these segments are entered into this tier, following a structured template that includes a range of metadata values. The metadata in the export tier for the KWATY/WATER example are shown in Figure 5.

15. For example we have considered cross-referencing signs in our corpus to Kendon's numerical sign identifiers.

Figure 5: *Annotation window in ELAN for project file <20110630_CLong_01> showing the export script for the KWATY/WATER clip*



(v) Export clips and metadata

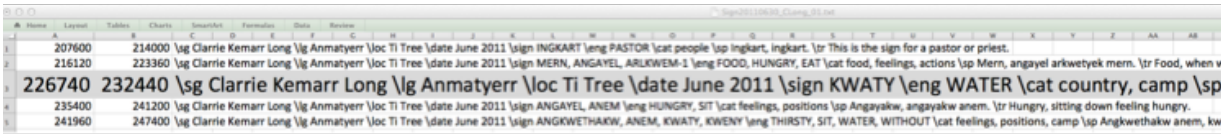
Once the selections have been made in the export tier, and structured metadata entered for each selection, both clips and metadata are ready for export from ELAN. This is a two-stage process. An export script[16] commands the transcoding program Ffmpeg to create a clip of each selection.[17] Ffmpeg assigns a file name to the clip, which comprises the original project file name appended with the beginning and end time code values of the position of the selection within that file. To illustrate, the file name of the derived KWATY/WATER clip assigned by the ELAN export script command is <Sign20110630_CLong_01_226740_232440.mp4>.

The metadata and the time codes for selected clips are exported from the export tier via the 'export as tab delimited text' command in ELAN. This provides an array of structured metadata annotations alongside the time codes for each segment selected from the source media file. Figure 6 shows part of a tab delimited text file exported from ELAN and opened in a spread sheet. Each row contains the metadata for a selected clip and the KWATY/WATER example is highlighted. Note the time codes in the first two columns correspond to those in the file name of the example clip.

16. The export script is located in the clip-media.txt file in the ELAN application folder. The required script is as follows: <ffmpeg -y -i $in_file -ss $begin(sec.ms) -t $duration(sec.ms) -vcodec h264 -acodec aac $out_file>. To enact this script requires installation of Ffmpeg, see: http://www.ffmpeg.org/.

17. For details about batch exporting of clips see the ELAN manual, section 4.9.2.8, at http://www.mpi.nl/corpus/html/elan/ch04s09s02.html.

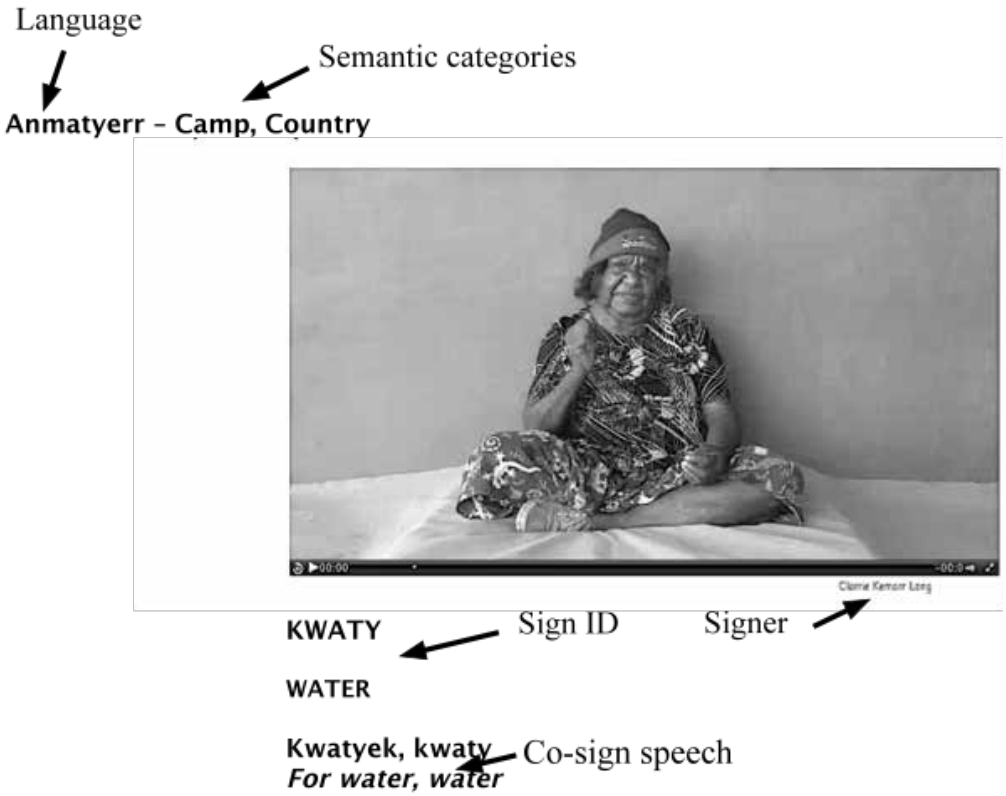
Figure 6: *Part of a tab delimited text file exported from ELAN with KWATY/WATER example highlighted*



(vi) Build website posts

We used Wordpress to build the *Iltyem-iltyem* website. Wordpress is an open source content management service, with a built-in capacity to publish online content with titles, text, embedded video, images and audio. The content can be categorized, searched and commented upon. People can register accounts with a Wordpress site, and editorial functions can be restricted to registered members. The *Iltyem-iltyem* project has extended these features for better site usability and manipulation of sign data, using a combination of publicly available and custom plugins.[18] Figure 7 shows a screen capture of the KWATY/WATER example clip and metadata, as a published post on the *Iltyem-iltyem* website.

Figure 7: *The KWATY/WATER post*



This post was generated by the Wordpress engine, following three steps. First the clips were uploaded to the host server via Wordpress. Next, the corresponding metadata text files (as shown in Figure 6) were imported into Wordpress. The final step involved linking time code information in the metadata to time codes in clip file names, and building posts that combine

18. Plugins are packets of code that extend the core behavior of existing software.

metadata and clips. The metadata is displayed on screen with the video clip, identifying the signer, the Sign IDs (Indigenous language and English), co-sign speech and speech translation. The signer's spoken language identity and the semantic categories the sign clip belongs to are displayed above the clip. The website is searchable across all these parameters – for example, viewers are able to search for all clips contributed by any given signer or recorded in a particular community, all the clips containing particular local language and English terms, and all clips belonging to different semantic categories. The search function includes filters, which allow searches to be constrained.

The *Iltyem-iltyem* website enables various levels of access to content and material in both the front and back ends of the website. At its basic level it is open for subscriber access, which allows non-editable access to open material. There are also editor, researcher and administrator roles. This allows others who are not part of the project team to review, comment on and edit posts.

Conclusions

The *Iltyem-iltyem* website is unique in several ways. Although there are online dictionaries for some primary sign languages, *Iltyem-iltyem* is the first searchable online dictionary of an Australian Indigenous sign language. To our knowledge it is also the first of an 'alternate' sign language to include embedded video and to represent multiple 'alternate' sign languages in a single online repository accessible to both community and academic audiences.[19]

Consultation about access to sign language material continues with communities. Although the searchable sign dictionary focuses on sign utterances filmed in elicitation contexts, we are also expanding the capacity of the website to host short films showing sign language in use, and demonstrate the multimodal nature of communicative practices in Central Australia. This includes recordings of sand stories, where sign is used along with drawing, speech and song (Green, 2014). We are planning for a project review in 2016 and at this time all consultants or their families will be able to add and/or withdraw material, and reflect on the consequences of being 'online'. Post 2016, the website will be archived, but we also aim for it to continue as a live media product.[20]

Sign language annotation is time consuming and requires specialist knowledge (Green & Wilkins, 2014). Building a corpus of time-aligned annotations linked to media provides access to a refined data set in which representative clips are labelled and searchable across a range of parameters. Extending this to an online repository of curated sign language material thus represents increased value for money for the research investment. The online repository enables researchers to work collaboratively on research questions, such as the degree to which sign languages in Central Australia differ across language groups and what similarities and differences exist between these and Indigenous sign languages found further afield.

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19. Examples of on-line sign language dictionaries include the Auslan Signbank Dictionary (http://www.auslan.org.au), the British Sign Language dictionary (http://www.british-sign.co.uk/british-sign-language/dictionary/), and the New Zealand Sign Language dictionary (http://nzsl.vuw.ac.nz) – see also McKee & McKee (2014). The Summer Institute of Linguistics (SIL) is currently developing and testing a program called SooSL (See Our Own Sign Language), designed to support the creation of video-based dictionaries for sign languages of the world (http://www.sil.org/about/news/new-technology-supports-language-development-signed-languages).

20. The http://iltyemiltyem.com website will be archived through the National Library of Australia's Pandora project: http://pandora.nla.gov.au/subject/12. Sign recordings from the project and associated derived files are archived at the Endangered Languages Archive at SOAS, London (http://www.elar-archive.org/) and at AIATSIS (http://www.aiatsis.gov.au/collections/ava.html).

The workflow we have outlined in this paper is designed for multiple uses of sign language data: edited films published on DVD or USB for a community audience and for use as consultation tools, selected clips presented online, and a research corpus of annotated sign language recordings. The export functions of ELAN are used to create the clips that are uploaded to the website, and provenance is maintained between the original media and the use of selected parts of it on the website through media file names and their metadata. In particular, the project aims for best practice in language documentation by ensuring the metadata on the website reflects the curatorial structure of the archival deposit. Planning for long-term preservation of language recordings and metadata is central to best practice in language documentation and a key part of the Iltyem-iltyem project. However, capacity constraints and community needs are also fundamental. In this paper we have demonstrated how various factors influence our project workflow. These include the multilingualism of the communities we work with, the multimodal nature of sign language recordings and the need to create a diverse range of outputs tailored for a range of audiences.

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Desa Kolok and its Deaf people

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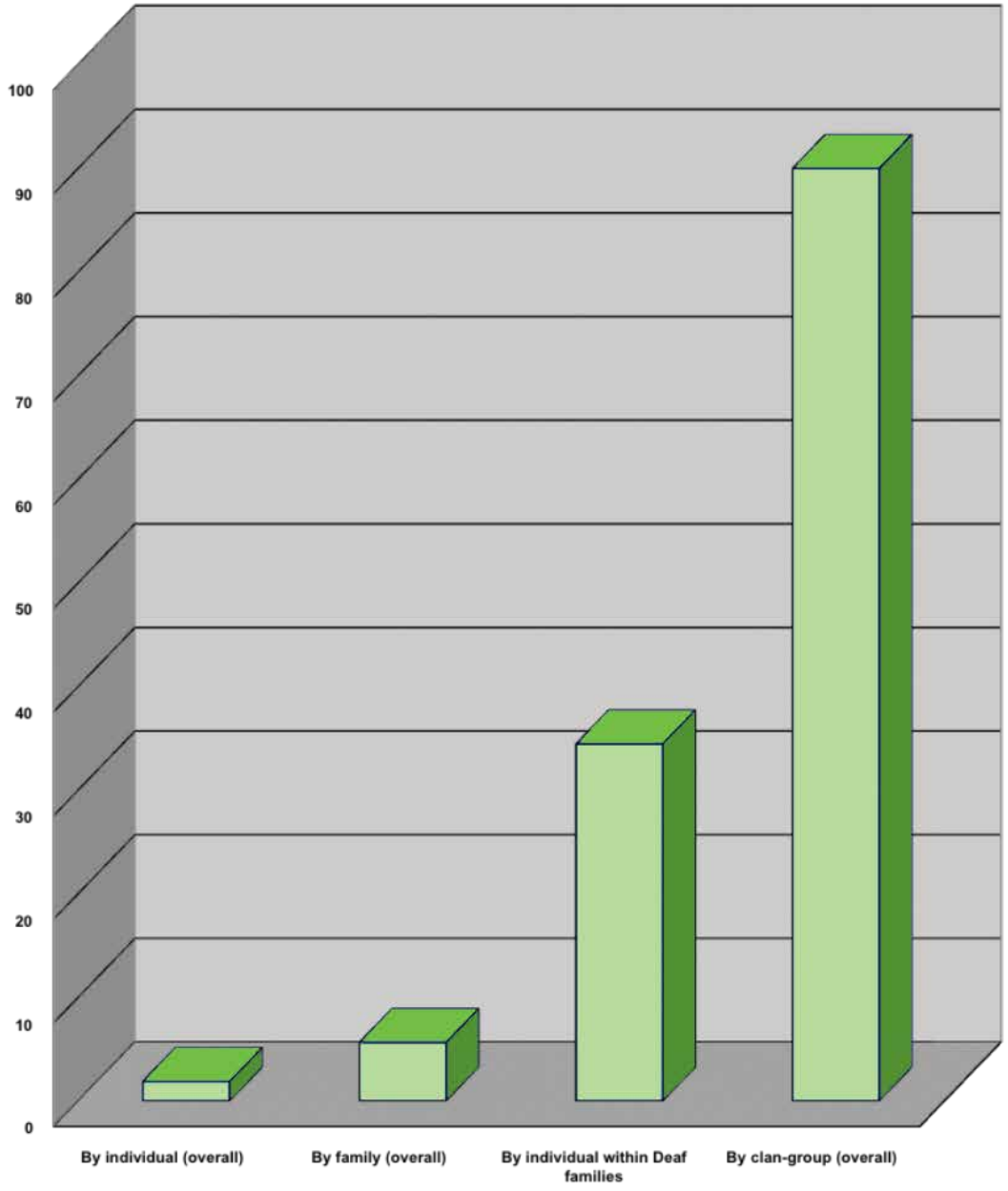
Keywords: deafness, hereditary, non-literate society, assimilative deaf-hearing community

The village

Desa Kolok (literally means Deaf village) is a small village located in North Bali, Indonesia. With regard to deafness, this village is remarkably exceptional compared to other villages in the area and, in fact, across the whole island of Bali. While all villages in the surrounding area have between two to nine deaf people, this village has 44 deaf people out of a population of 2,200. This is a rate of 2% and it is extraordinarily high compared to other pockets of deafness across the world (see Kakumasu, 1968; Groce, 1985; Washabaugh, 1986; Okyere and Addo, 1994; Johnson, 1994). Moreover, the existence of Deaf people in this village has occurred over several generations resulting in the whole population of the village being well adapted to the situation. The Deaf people here belong to, not only certain families, but the whole population of the village because all ten clan-groups that make up the village community have been found to have Deaf people. Geographical and social isolation combined with intermarriage patterns involving members of close families appear to be the most responsible factors for the high level of deafness incidence in this village. According to a scientific study, the high incidence of deafness in *Desa Kolok* is caused by the spread of a non-syndromic congenital recessive deafness gene called 'DFNB3' (Liang et al., 1998). Due to the spread of this deafness gene, the village has always had Deaf for many generations.

The Deaf population in the village

Graph 1: *The rate of deafness in Desa Kolok with regard to different social groupings*



Source: Marsaja, 2008 p. 61

The present 44 Deaf in the village includes 21 males and 23 females aged between 1.5 to 83 years. These Deaf people are widely spread in the village community, including all ten clans residing in the village. Looking back into a previous record, the average percentage of *kolok* in *Desa Kolok* had once reached as high as 2.15% in 1995. The number of Deaf in this village at the time was 47 out of a population of only 2,185 (Friedman, et al., 1995, p. 86). Compared to the present figure, the Deaf population in the village had only dropped slightly from 2.15% to 2% in over 19 years. There are a number of well-grounded reasons why the rate of deafness in this village is always high. Firstly, deafness that spread in the village is caused by a recessive

deafness gene called *DFNB3* specifically belonging to the village and this gene has also found to affect people from a neighbouring village of Bila. Liang et al. (1998) claim the *DFNB3* deafness gene found in *Desa Kolok* makes a significant contribution to hereditary deafness in the world. The present 44 Deaf together with their 85 close hearing family members are highly potential of transmitting the gene to an indefinite number of children and grandchildren in an indefinite number of generations to come.

Secondly, all of the *kolok* people in *Desa Kolok* who are over twenty years old are married. Marriage breakups among them are frequent but they normally remarry again. The 23 *kolok* families identified in the village comprise 13 (56.52%) Deaf couples, 2 (8.70 %) Deaf-hearing couples, and 8 (34.78 %) hearing couples with Deaf children. This suggests that marriages between Deaf are very common, making deafness even more easily inherited to the coming generations. The number of hearing-hearing couples giving birth to Deaf children was also surprisingly high. This is likely to be resulted from the fact that either one or both of these hearing couples are related to the members of the hereditary *kolok* families who possibly still carry the *DFNB3* recessive deafness gene with them.

The roles of the Deaf people in the community

The *kolok* in their *adat* (traditional community) roles

Similar to all the village communities across Bali, *Desa Kolok* is a community with two different systems: *desa adat* (traditional community) and *desa dinas* (modern community). The *desa adat* is concerned with the management and maintenance of temples and religious activities, while *desa dinas* is concerned with modern civil community activities such as education, laws and regulations, trades, etc. The Deaf men generally attend meetings that are held regularly by both the *desa adat* and *desa dinas*. The main language used in meetings is Balinese and a hearing person who sits next to a Deaf person normally interprets the meeting for him voluntarily using *Kata Kolok*, the village sign language. The Deaf people participate actively in all areas of community activities. During a temple ritual, they make offerings and go for a prayer as ordinary hearing people do. Although they are not able to read any printed calendar, they can generally predict with precision when a temple festival will occur in the village. One privilege that is given to the Deaf people is they are exempt from any money levies, probably due to the fact Deaf families are among the poorest in this village.

In various activities, especially which require hard labouring such as a digging grave for somebody's burial, catching, carrying and butchering animals for a family feast and celebration, carrying the dead to the burial, carrying a *wadah*[1] to the cemetery, etc., the most prominent role of all is the digging a grave in the cemetery for the dead. Grave digging in this village is exclusively the duty of the *kolok*. This practice is not common in other villages across Bali, where digging a grave is normally done by members of close family of the dead. It is not clear when and how this practice started in the village. As far as the village's oral tradition is concerned, it was due to the bravery of the *kolok* to confront and tackle the evils of the cemetery of which the majority of the hearing are generally scared. Many hearing people in the village believe that the *kolok* are close friends of both the evils and the angels of the cemetery. They also believe the *kolok* have the ability to communicate with those supernatural creatures using their sign language.

1. Wadah is a tall pyramidal wooden structure full of ornamental decorations in which the dead person is placed when cremated. The wadah is carried in a ceremonial procession from the home of the dead to the cemetery where it is finally burnt together with the dead.

When somebody dies in the village and he or she is going to be buried, a member of his or her close family would contact one of the senior *kolok* to prepare the grave for the dead in the cemetery. The *kolok* would then contact their crew and go to see the family of the dead. They would normally have a cup of coffee with the family members while discussing when the burial will be conducted. In the early morning of the day of burial, the *kolok* would also need to come once again to the family of the dead, have a cup of coffee, and then collect the necessary tools and offerings for the digging. Upon finishing their duty to dig a grave in the cemetery, they generally return to the family of the dead to have some lunch. After lunch or sometimes in late afternoon, the *kolok* would also join in the procession to the burial together with other hearing members of the community.

As a reward for conducting this particular *adat* duty, each of the *kolok* involved generally receives ten thousand *rupiah* (approximately US$1.00) from the family concerned. This amount of money is worth approximately one day of labouring jobs in or around the village. Besides this, the *kolok* can also collect some pieces of *pis bolong* (ancient Chinese coins) from their digging which they can sell for another ten thousand *rupiah* (US$1.00) per *satak* (two hundred pieces). Every dead body buried in the cemetery has to carry quite a few *pis bolong* in his or her grave. The wealthier the man or woman who died, the more *pis bolong* he or she is likely to carry in his or her grave. As quite a few *pis bolong* may be collected in just a single digging, the majority of the *kolok* consider the grave digging as a very rewarding *adat* duty.

Another explanation of why the *kolok* do this particular *adat* duty in the village came from the *dinas* authority. The *kepala desa* (head of the official village) of the village stated that the *kolok* were freed from any public *adat* levies and they had to do the grave digging duty as compensation. While this explanation sounds pretty logical, it does not seem to gain support from the *adat* authority. The *kelian adat* (*adat* chairman) argued that there was no proof in the *adat* records for the link between the digging duty and exemption of levies for the *kolok* families. There was virtually no evidence as to whether the two phenomena occurred at the same time in such a compensatory nature or they each occurred at a different period with a different motivation.

In other areas of private *adat* involving family-based cultural events such as *tigabulanan* (three month) and *otonan* (six month) celebrations for a baby; *mesangih* (tooth filing); *ngaben* (cremation); wedding etc., the *kolok* participate actively like the hearing. As such family celebrations also tend to involve *mebat* (chopping and cooking), *mecarar* (distribution and packaging of food), *mejejahitan* (making ornaments) and *metanding* (arranging offerings) as the case in an *odalan* (temple festivals), the *kolok* are generally involved in this activity together with other hearing members of the family. However, their involvement in these private *adat* activities seems to be slightly different from those in public *adat* activities. The involvement of *kolok* here seems to be more prominent and active. In any family-based *adat* celebration, the *kolok* generally start with a job to catch the animals for the celebration (i.e. pigs and/or chickens) and carry them to the location of the celebration. This job is normally conducted the day before the celebration and the *kolok* who are involved would be given a generous amount of money in return. On the day of the celebration, the *kolok* generally help the family to butcher the animals and make them ready for the *mebat*. The women *kolok* help other women *mejejahitan* (to prepare offerings), *nyakan* (to cook rice) and *mekedas-kedas* (to clean up in and around the family compound). After the *mebat* and *mejejahitan* activities have been completed, the people who participate including the *kolok* are all given a big feast.

During a *ngaben* (cremation ceremony) which is in most cases also considered a family-based cultural celebration (i.e. private *adat*), involvement of the *kolok* is basically similar to that in other private *adat* practices such as *tigabulanan* or *otonan*. One type of involvement of the

kolok in a *ngaben* which seems to be particularly vital and always receives appreciation from most hearing families is carrying the *wadah* in the procession to the cemetery. As the *wadah* is generally tall and huge, it normally requires a lot of people with strong muscles like the *kolok* to carry it along in the procession to the cemetery. The *kolok* who are involved in this tiring task normally receive some money from the family involved as a reward. Such a practice is not common for the hearing people who do the same. In fact, it may be considered as a serious offence to them if they are offered some.

The kolok in their dinas (modern community) roles

Within the *dinas* stream, the *kolok* function almost in the same way as the hearing members of the community. The Deaf men attend official meetings and participate in various *dinas* activities. In some *dinas* organisations and activities, the roles of the *kolok* are even more predominant than the hearing. These include the *hansip* (civil defence force), the village's clean water system, the cattle breeding programme and the *tempe-tahu* (soybean) food production.

The members of the *hansip* (civil defence) of the village are dominated by the male *kolok*. The *kolok* are well honoured by the villagers for their bravery and commitment as guardians of the village. The existence of the *kolok* community in the village is often associated with the security of the whole village. Many of the villagers stated thieves and burglars who often operated in the surrounding villages were too scared to enter the village due to the vigilance of the *kolok*. One male *kolok* used to be hired for a long period of time by a rich family from another village to operate and guard their coffee drying and processing business. The bravery of *kolok* in their *dinas* roles here seems to be closely related to their bravery in their *adat* roles particularly with regard to their special duty of digging graves in the cemetery which ordinary villagers may find too scary to perform.

Besides *hansip* (civil defence), the *kolok* also play a prominent role in the supply of clean (drinking) water for the whole village. The village's drinking water is taken from a natural spring located miles away from the village. It is carried along and distributed to houses using medium-sized and small plastic pipelines. The *kolok* are assigned by the *kepala desa* (head of the village) to maintain the pipelines and guard them from being damaged or stolen by people from neighbouring villages. This *dinas* duty attracts various rates of labouring wages for the *kolok* involved depending on the types of jobs and the amount of time spent for the jobs.

Another prominent role of *kolok* in *dinas* affairs seems to be related to a cattle-breeding programme. The programme was sponsored by the state government but was fully run by the *desa dinas* in the village. The basic aim of the programme was to help the poor in the community. As *kolok* families belonged to those of the poorest in the village, the majority of them deserved to join and be included in the programme. Each of those families received either one young cow or a goat to breed in their own farm. The first offspring of the cattle has to be returned to the village to be distributed further to another family who deserves it, and then the cattle became theirs.

Similar to the cattle-breeding program was the *tempe-tahu* (soybean food) production programme. The programme was also sponsored by the State Government through the Department of Social Welfare but was fully managed by the *desa dinas*. It was intended to help the poor in the village with some instant job opportunities. The facilities and the first capital for running the food production programme were fully supplied by the sponsor. The capitals for the following rounds of production had to be taken from the previous sale of the product. At one stage, this programme had successfully employed a lot of *kolok* as well as a number of interested hearing people in the village, but was unfortunately discontinued due to a poor quality of financial management.

The *kolok* and their unique Deaf cultures

Apart from active participation in the mainstream cultures, the *kolok* also develop and maintain specific Deaf activities. The *kolok* have established a strong Deaf alliance in the village. This alliance is known and signed as KOLOK MEKEJANG 'Deaf together', but among the hearing people, it is called *perkumpulan kolok* (Deaf Alliance). The alliance is an informal group that has no real structure, but some *kolok* do appear to have a joint leading role for the alliance. The alliance appears to function as a forum for unification and solidarity among the *kolok* and their families. It is also a forum through which all Deaf can work and help one another in their everyday life. In sociocultural terms, the alliance may also function as a specific *adat* institution for the *kolok* that prescribes the rights and responsibilities of the *kolok* within the alliance.

Perkumpulan kolok is more visible from its activities rather than from its internal structure. The alliance regularly performs and conducts social and cultural activities such as *suka-duka kolok* (happy and sad gatherings among *kolok* families), *kolok* feast, *janger kolok* (*kolok* dance) and the *pencak-silat kolok* (*kolok* martial arts). At the same time, the alliance also hosts gatherings that involve a high level of signing expertise such as telling stories and experiences, sharing new information and job opportunities, and talking about trades and businesses that specifically concern or affect the life of the Deaf people in the village. If a *kolok* family conducts a *suka* (happy) celebration, all the *kolok* from other families are expected to come through the alliance to share the happiness in the family. The same obligation applies when a Deaf family is at time of *duka* (sadness, mourns) due to a death of a family member. Absence from any occasion that involves Deaf families has to be clarified immediately so as not to disturb the harmony within the *kolok* alliance. In such an occasion all the Deaf will gather with the celebrating family members and help prepare for the celebration. As all the hearing people from the celebrating family are involved, social interactions occur, not only between the Deaf, but also between the Deaf and the hearing people. This is how assimilation between the Deaf and the hearing people develops and is maintained especially across Deaf families in the village. These patterns of *suka-duka* activities are very different from those that are conducted within the mainstream culture of the village. If a celebration concerns a hearing family, people from non-related families are not normally expected to come, unless they get invited. In this case, only close or extended family members are expected to come without invitation.

Apart from *suka-duka* activities, the *kolok* and their family members also gather regularly in a special *kolok* feast. This is another social activity through which the *kolok* and the hearing people in the village improve and maintain their relationship with one another. At certain times of the year (generally after rice harvesting period), the *kolok* take a day off from work and come together for a big feast. The feast is generally conducted in an open area such as a garden, rice-field, or playground. It is not common for a feast that concerns no specific family to be run in a family compound. This is probably for neutrality purposes. At this stage, it is not clear how frequent and why the *kolok* regularly organise a big feast. From what people do during the feast, it appears it is mostly a socialising and eating event. The activity normally begins at lunchtime starting with preparation of food and drinks, then followed by either a banquet type of feast or ration type of feast, depending on how much food is available and how many people are involved. As the activity involves many *kolok* people, a lot of signing is used during the feast. This social activity does not only involve *kolok* people, but also many hearing members of their families. Other hearing people from non-Deaf families such as employers of the *kolok*, staff from the office of the head of the village, workmates of the *kolok* also get invited. The hearing people who come to the feast are normally fluent signers who can understand and communicate freely with the *kolok*.

One important thing to note from this feast is *kolok* generally prefer to have a dog for the feast. It is not clear why they prefer dog-meat to other meat for the feast. The hearing people involved generally say that a dog is far cheaper compared to other meats so that the *kolok* can have enough food to eat. However, from a number of feasts the researcher attended in the village, no *kolok* have ever talked about or complained about the cost of the feast. The *kolok* always say dog-meat is good and it gives them a lot of energy. Besides this preference, there is also a story, in the past, the *kolok* used to have a cat instead of a dog for the feast. Some people believe the *kolok* in the village gained deafness from eating too much cat-meat.

Another prominent activity of the *kolok* in this village is *kolok* dance that is more popularly known as *janger kolok*. The dance takes the form of a Balinese traditional performance called *janger*. *Janger* is a performance that involves a loud *gamelan* (traditional orchestra) and a young female dancer with beautiful and colourful dress and headdress. The dancer has a fan on one of her hands. The dancer is following the rhythm of the loud music and invites male dancers (one at a time) from the audience to dance together on the stage. One dancer normally picks up four to five male dancers to be invited to the stage before she finishes her performance. As the case with the *janger kolok*, the gamelan is performed orally by the male *kolok* using whatever noise they can produce from their mouth. The tune of this oral music is in fact very close to the normal music that is used by the hearing. It takes a lot of practice involving a hearing dance teacher to establish a *janger kolok*. The dance teacher said that he had to use different types of movement patterns to control and manage the tune of the *kolok* oral music. Besides this fluent interpreters are also to be involved if the teacher cannot sign well.

Janger kolok is not only a cultural activity for the people in *Desa Kolok*. A number of professional performances have been conducted in towns and cities around Bali. The local government sometimes invites the *janger kolok* to perform in an important event such as Independence Day and Anniversary Day. Arcana (2003), a journalist from *Kompas*, notes that *janger kolok* is alive and well in *Desa Kolok* and often performs in a number of international hotels in Denpasar.

During the performance of *janger kolok*, the *kolok* also generally present *pencak-silat kolok* (*kolok* martial arts). This is actually another entertainment activity that can be presented on its own without *janger kolok*. Similar to *janger kolok*, martial arts are also very popular among the hearing population in this village. The *kolok*, especially the males, are particularly interested in this activity because they take a *dinas* role as members of the *hansip* in the village. Martial arts are considered to be an essential training element if a person wants to become a member of *hansip* in the village.

The dancing and martial arts are in fact recent introductions into the village and have been promoted by hearing people with a more Western, welfare orientation towards the *kolok*. As was indicated with regard to the earlier study of *Desa Kolok*, Western notions of 'disability' and 'normality' are beginning to be felt in the village as the *kolok* come under the influence of government welfare programs (Branson, Miller & Marsaja, 1996).

The maintenance of the *kolok* cultures in the village such as *suka-duka kolok*, *kolok* feast, *janger kolok*, *kolok* martial arts, etc. implies the maintenance of *Kata kolok*. *Kolok* gatherings seem to become the most favourable settings in which *Kata Kolok* is used extensively. As interaction with the Deaf becomes intense in any such gathering, so does the use of *Kata Kolok*. The use of *Kata Kolok* signing during any *kolok* gatherings here can be considered as another sub-culture that relates more towards the life of the Deaf people rather than to the hearing people.

The amount of signing used during a *kolok* gathering appears to be very high equalling that found across *kolok* families. In terms of speed and fluency, signing during a Deaf cultural activity is also as fast and fluent as signing within the Deaf families. The people, Deaf and

hearing, generally scatter into several groups and each talk about different topics or stories. Topics are changing very rapidly within any group and all people want to bring up their topic to the group. It appears the hearing people involved here all have identified themselves as Deaf in a social sense because they tend to show up with their signing expertise and try not to be involved in talk with other hearing people.

Kata Kolok here serves, not only a communicative function, but also a solidarity function. The people who get involved in any Deaf activity conducted through the *perkumpula kolok* use *Kata Kolok* as a means of socialising with one another, telling stories and experiences, sharing new information, talking about job opportunities, wages, trades and businesses that specifically concern the life of the Deaf and their families.

Concluding remarks

In sociocultural terms, the Deaf people in this village are an integral part of the whole village community rather than belonging to a particular section of the community (see Marsaja, 2003; 2008). All of the Deaf are related in one way or another with the hearing people in the community. On a clan-group basis, the Deaf people here belong to all of the ten clan-groups that make up the whole village's community. They are accepted in their families as well as in the community, and are awarded full rights and responsibilities in the village. They participate fully and actively in all spheres and at all levels of the community's life. The presence of hereditary Deaf people in this village has really made the villagers adapt themselves to the condition by developing sociocultural systems that are accommodative to the life of both the Deaf and the hearing in the community.

The factors that motivate the integration between the *kolok* and the hearing population in this village seems to be similar to those which were found in the nineteenth century Martha's Vineyard Island in Massachusetts (USA) and the Yucatec Mayan Village in Mexico. The assimilation of the *kolok* into the hearing community here is characterised by three main features as described by Lane, Hoffmeister and Bahan (1996):

- multigenerational Deaf people through which culture and language are transmitted,
- geographic and social isolation which motivate endogamous marriages making Deafness even more recessive in the community, and
- the use of a sign language by both the Deaf and hearing people around.

In addition to these general factors, the village was also found to have a number of specific social and cultural systems, organisations, alliances and social networking systems through which the Deaf can develop and maintain their strong assimilation with the mainstream hearing population (Branson, Millers and Marsaja, 1996; 1999; Marsaja, 2003; 2008). Apart from assimilating through the mainstream sociocultures, the *kolok* people in this village have also been assimilating through the development and maintenance of special Deaf activities and ways of interacting that live within the wider mainstream hearing cultures. The roles of the Deaf sub-cultures here are not only a means of assimilation but also appear to become a social identity for the *kolok* in the village. The specific Deaf activities identified include *kolok* alliance, *kolok* feast, *janger kolok* and *kolok* martial arts. The way *Kata Kolok* is used within *kolok* families and during any *kolok* social gatherings or cultural performances is also culturally distinct. This is because the uses of the sign language for these domains appear to be significantly different in terms of fluency and the use of special jargon compared to the normal uses of it in everyday communication with the hearing people around (see Marsaja, 2008; de Vos, 2012). These specific sociocultural factors have never been identified from earlier studies on assimilative Deaf communities.

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Toponyms in Ban Khor Sign Language

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Introduction

Ban Khor Sign Language (BKSL) is a rare language variety known as a 'village' (Zeshan 2004) or 'indigenous' (Woodward 2000) sign language. This type of sign language develops in small face-to-face communities where historically there are/were: 1) demographically significant[1] numbers of deaf people in the population; 2) high degrees of real or fictive kin relatedness among community members; 3) low levels of educational differentiation between deaf and hearing residents; 4) non-industrial, labor-intensive local economies; and 5) low degrees of occupational differentiation between deaf and hearing villagers. The most striking characteristics of the language ecologies of signing village communities, however, involve their local language ideologies and practices. In such communities, there are no sign language interpreters. Instead, it is common not only for deaf people but also for hearing residents to acquire and use the village sign language. Because it is widely used by both deaf and hearing people in the course of everyday life, the village sign language facilitates the inclusion (vs. exclusion) of deaf members of the community.

Villages with indigenous sign languages are unusual but have been found elsewhere: in Africa, the Americas, Asia, Australia and Oceania, the Caribbean, and the Middle East (Branson & Miller 1996; Branson et al. 1999; Cumberbatch 2012; Delgado 2012; de Vos 2012; Dikyuva 2012; Ferreiro-Brito 1983; Fox Tree 2009; Frishberg 1987; Groce 1985; Haviland 2011; Hinnant 2000; Johnson 1991, 1994; Kakumasu 1968; Kendon 1980a, 1980b, 1980c; Kisch 2004, 2007, 2008, 2012a, 2012b, 2012c; Kuschel 1973; Kusters 2012; Lanesman & Meir 2012a, 2012b; Le Guen 2012; MacLeod 1973; Marsaja 2008; Maypilama & Adone 2012, 2013; Meir et al. 2010; Nonaka 2004, 2009, 2010, 2011, 2012a, 2012b; Nyst, 2007 2012; Nyst et al. 2012; Osugi et al. 1999; Panda 2012; Sandler et al. 2005; Schuit 2012a, 2012b; Shuman 1980; Torigoe et al. 1995; Van den Bogaerde, 2005; Washabaugh 1978, 1986; Woodward 1982). Study of these communities' alternative social constructions of and communicative responses to deafness is enriching anthropological understanding of cultural variation, and research on the local sign languages is expanding knowledge of linguistics in areas such as: documentary linguistics, typological linguistics, historical linguistics, language universals, and so on.

In anthropological linguistics, there is a robust literature on onomastics—the study of the origin and forms of proper names (personal, place, brand, etc.). Names are interesting and useful phenomena for linguistic and cultural analysis because naming systems and practices mirror and order the social world.

This article provides first-pass description of 'toponyms,' or place names, in Ban Khor Sign Language. The paper's primary aim is to explicate the linguistic organization and underlying

1. The actual numbers of deaf people vary considerably in the communities where village sign languages have developed, ranging from a small handful to many hundreds. Statistically, however, the numbers are significant, exceeding the scientifically established percentage of 1/1,000 individuals expected to be born deaf (Reardon et al. 2004, p.8).

cultural logic of BKSL toponyms, which reflect and instantiate their social environment of origin and use. Additionally, this case study offers interesting and immediate insights into matters of linguistic etymology, lexical conventionalization, and historical linguistic change. Research on proper place names usually centers on old(er) languages and is strongly historical, that is, it typically traces existing onomastic forms, over long periods of time, back to their etymological origins. BKSL, however, is a young language, just 8~10 decades old. Examination of this indigenous, village sign language offers a rare glimpse into the contemporary descriptive derivations and development of an incipient place name system. Recently, especially within the last 5 years, Ban Khor Sign Language's toponymic onomastic system has begun to alter; and those changes are considered here vis-à-vis issues of language contact, shift, and endangerment.

Onomastic Research and Signed Languages

Onomastic research on signed languages has predominantly focused on personal name signs (Meadow 1977; Baker-Shenk 1987; Yau & He 1987a, 1989; Supalla 1990, 1992; Mindess 1990; Hedberg 1991, 1994; Desrosiers & Dubuisson 1994; Machabee 1995; Yau 1996; McKee & McKee 2000; McKee et. al 2000; Delaporte 2001; Strauss-Samaneh 2001; Kourbetis & Hoffmeister 2002; Nyst & Baker 2003; McNamara 2003; Rainò 2005; Van Mulders 2005; Day & Sutton-Spence 2010; Chen 2007; Mackevicius 2010; Paales 2010, 2011a, 2011b; Esipova 2013; Nonaka et. al [in press]; Leeson & Saeed [forthcoming]). By contrast, there are only a handful of studies of place names in sign languages (Paales 2002; Yau & He 1987b; Peng & Clouse 1977).[2] Thus, there is no working model or established typology of toponymic onomastics in manual-visual languages.

Preliminary comparative examination of dictionary data from 'national' (Woodward 2000) or 'urban' (Zeshan 2004) sign languages, however, reveals some striking differences between place names in those languages and in BKSL. As the examples in Figure 1 illustrate, place names in American Sign Language (ASL), Australian Sign Language (AUSLAN) and Thai Sign Language (TSL) differ from each other. Yet their respective toponymic systems exhibit basic similarities when compared to Ban Khor's indigenous sign language. AUSLAN (Johnston 1998), ASL (Humphries et al. 1985), and TSL (Suwanarat et al. 1990) all have:

1. **robust place name vocabularies** for both domestic and international locations
2. **orthographically influenced** signs—i.e., ones that are either initialized (made using one or more letters of the manual alphabet) or fingerspelled entirely
   a. Example 1: Initialized sign C for Canberra in AUSLAN
   b. Example 2: Initialized sign W for Washington, DC in ASL
   c. Example 3: Initialized sign T for *Tak* in TSL
3. predominantly **mono-lexemic** toponymic onomastic systems
4. at least some **"descriptive"** signs (Supalla 1990, 1992)—i.e., ones etymologically derived from something (physical, habitual, idiosyncratic, historical, etc.) distinctive or famous about the place
   a. Examples 1: AUSTRALIA, in both Australian and Thai sign languages, depicts a 'hopping' movement reminiscent of a kangaroo, an animal species unique to the country
   b. Example 2: CALIFORNIA, also the sign for GOLD, relates to the California Gold Rush

2. A search, using the keyword "names," of the online I*nternational Bibliography of Sign Language* revealed only three studies of place names in signed languages: Peng & Clouse, 1977; Yau & He, 1987; and Paales, 2002. No other studies were found either via searches of Google and the EBSCO database or in the indexes of any major English-language journals dedicated to research on onomastics or signed languages

Figure 1: *Examples of Toponyms in Australian Sign Language (AUSLAN), American Sign Language (ASL), and Thai Sign Language (TSL)*

AUSLAN	***ASL***	***TSL***
AUSTRALIA	***AUSTRALIA***	***AUSTRALIA***
		
(Johnston 1998, p.522)	(Humphries et al. 1985, p.229)	(Suwanarat et al. 1990, p.140.1)
CANBERRA*	***WASHINGTON D.C.****	***BANGKOK (a.k.a Khrungthep)***
		
(Johnston 1998, p.398)	(Humphries et al. 1985, p.55)	(Suwanarat et al. 1990, p.1145.1)
DARWIN	***CALIFORNIA***	***TAK****
		
(Johnston 1998, p.255)	(Humphries et al. 1985, p.93)	(Suwanarat et al., 1990, p. 154.2)

* asterisk symbol indicates an initialized sign

Place names in Ban Khor Sign Language, by contrast, constitute a relatively small subset of the language's total vocabulary and are uninfluenced by the orthography of written Thai. BKSL toponyms are non-mono-lexemic. They consist of a string of (quasi-)descriptive signs, ending

with a deictic specifier—i.e., HERE, THERE, WAY-OVER-THERE. The final deictic specifier is a point, prototypically made with the index finger[3] and is a true directional or absolute point (Levinson 2003) that indexes the actual location as well as the relative distance (nearness or farness) of the place vis-à-vis the speaker and Ban Khor.

Interwoven with this basic linguistic organization is an underlying cultural logic that reflects and (re)instantiates the particular milieu in which BKSL developed and has been used. Place names in the language are locally and experientially anchored and can be divided into two basic, dichotomous domains: Ban Khor and non-Ban Khor. A distinct set of ideological and affective experiences and projections is associated with each domain. As the following analysis illustrates, this is the basic cognitive map that orients and structures the toponymic onomastic system in Ban Khor Sign Language.

Analysis of BKSL's Toponymic Onomastic System[4]

Ban Khor is the name of both a village (spanning just 1.8 square miles and administratively divided into four contiguous sub-villages) and a sub-district (consisting of 10 distinct villages, including its namesake). In both Thai and Nyoh (the two main spoken languages used in the multilingual area), ban means both 'home' and 'village'. Drawn from the name of the community's founder, Khun Khor, the word khor is a Nyoh word for a traditional wooden clacker put around the necks of water buffalo.

Exhibiting no relationship to either written Thai or to any spoken language used in the community, the place name for *Ban Khor* in BKSL is .....AREA.....(here) I/MY .....AREA.....(here). The basic gloss is the same for the sub-village, village, and sub-district. Yet as the examples in Figure 2 show, the three administrative units are clearly distinguished by size and intensity of signing.

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3. The final points of most BKSL toponyms typically are made using the index finger of the dominant signing hand, although other forms of pointing—i.e., with the hand, the mouth and/or head—can be and sometimes are used.

4. The data upon which this study is based was collected over the course of 12 years using three distinct but complementary methods. In 2002, as part of general lexical elicitation, BKSL toponyms were collected from 10 fluent, hearing BKSL signers using a written list of place names read aloud. The 110-word elicitation list included the names of all of the villages comprising Ban Khor sub-district; the immediate and surrounding district towns; the national capital of Bangkok; all Thai provinces; neighbouring Southeast Asian countries; and a few foreign countries in Asia and the West.

In 2008 more in-depth research on toponyms in BKSL was conducted with 20 fluent signers, both hearing and Deaf. The same 110-word research protocol that was used in 2002 was adapted so that Deaf Ban Khorians (most of whom cannot read) could participate in the study. Again, hearing participants listened to the 110-word list of place names read aloud and then demonstrated the corresponding signs in BKSL. Deaf participants were shown a large map with iconic photos of all of the villages comprising: 1) Ban Khor sub-district; 2) the immediate and surrounding district towns; and 3) the two closest provincial capital cities. Deaf research consultants signed the name of the place depicted on the map in BKSL. Additionally, all participants, regardless of audiological status, were interviewed by a local research assistant who used a standardized questionnaire to gather background information about their travel routines and experiences. With Deaf consultants, this was another means of eliciting BKSL toponyms at the sub-district and district levels as well as a few signs for other provinces and foreign countries.

The 2008 research project was specifically designed to test the hypothesis that the final deictic points in BKSL toponyms are absolute points. This was tested in two ways. Research was conducted and filmed at different sites in Ban Khor village. Additionally, at the two sites where most of the research filming took place, research tasks were intentionally arranged so that consultants had to sit or stand facing different directions while performing the tasks.

In all cases and regardless of audiological status, research consultants pointed in the actual direction of the place for which they were demonstrating the BKSL sign.

The third and final type of data involves lexical tokens of toponyms drawn from hundreds of hours of naturalistic conversational data in the target language. These data were gathered in the course of long-term participant-observation ethnographic research conducted between 2000~2012. Whenever possible, spontaneous examples of BKSL toponyms were compared with the elicited place names, yielding findings that were consistent with the ones being reported herein.

Figure 2: *BKSL Sign(s) for Ban Khor*

Figure 2a: *BAN KHOR Sub-village*




AREA (here) I/MY


AREA (here)

Figure 2b: *BAN KHOR Village*




AREA (here)



I/MY AREA (here)

Figure 2c: *BAN KHOR Sub-district*

AREA

(here) *I/MY*

AREA *(here)*

Figure 2c: *BAN KHOR Sub-district*

To articulate *Ban Khor*, the sub-village (Figure 2a), the signer utilizes the most circumscribed arc of spatial articulation for AREA. The arm is moderately extended and forms an arc closing very near the head as the hand drops in front of the forehead. In addition, I/MY is articulated directly on the chest, with the body drawn inward slightly upon contact with the hand, iconically representing a closeness to the speaker.

Ban Khor village (Figure 2b) is more expansive. AREA is articulated more distantly from the body. The arm is thrust forward with the fingers fully extended away from the body, the torque of which itself conveys distance. The falling arc of the arm begins higher above the head, and the hand drops a distance in front of the body (rather than immediately in front of the forehead as in the preceding figure). I/MY is again articulated directly on the chest, but the chest is erect (rather than drawn inward) indicating a more expansive, less interior relation to the speaker.

When signing *Ban Khor* sub-district (Figure 2c), the tendencies toward extension and expansion are even more exaggerated. AREA is now articulated in a space so large that the hand and wrist of the dominant signing hand sometimes exceed the limits of the camera's lens. Production of I/MY is markedly different too. In the previous examples the palm of the signer's hand makes full contact with and briefly rests on the chest. In this instance, however, I/MY is expressed with just the fingertips, which briefly graze the chest as the hand continues along its articulatory arc, suggesting a lesser degree of immediacy/possession vis-à-vis the speaker.

Non-manual linguistic features—i.e., facial expressions, mouthings, eye gaze, etc.—also distinguish the different *Ban Khors*. Notably, the most positive facial expression (e.g., relaxed face and smile) accompanying the signs I/MY and AREA is associated with *Ban Khor* sub-village (Figure 2a). To express *Ban Khor* village (Figure 2b), the lips are pursed in a manner similar to the mouthing *phoo*, a Nyoh word meaning 'there' or 'over there' that has been grammaticized in BKSL and that typically accompanies the signs THERE or OVER THERE, which are expressed as deictic points. In this case, however, the phoo mouthing along with slightly scrunched eyebrows and slightly distant eye gaze combine to indicate the larger administrative unit and more distant HERE. The non-manual markers that distinguish Ban Khor sub-district (Figure 2c) are two-fold: 1) even more distant eye gaze and highly raised and spread eyebrows, both suggesting still greater spaciousness, and 2) puffed cheeks, a facial expression of largeness or importance accompanying other signs like BIG or VILLAGE HEADMAN (Nonaka 2007, p.75).

Ban Khor's nested organization (sub-village, village and sub-district) is at the geographical and experiential center of BKSL speakers' cognitive map (see Figure 3a). Other places are concentrically arranged outward at ever-greater distances to the periphery—i.e., other villages in the sub-district; the district capital; neighbouring (sub-)districts; the provincial capital; and other national and international places (Figure 3b).

Figure 3: *The Areal, Experiential, Affective, and Linguistic Organization of BKSL's Toponymic Onomastic System*

Figure 3a: *BKSL Signers' Cognitive Map*

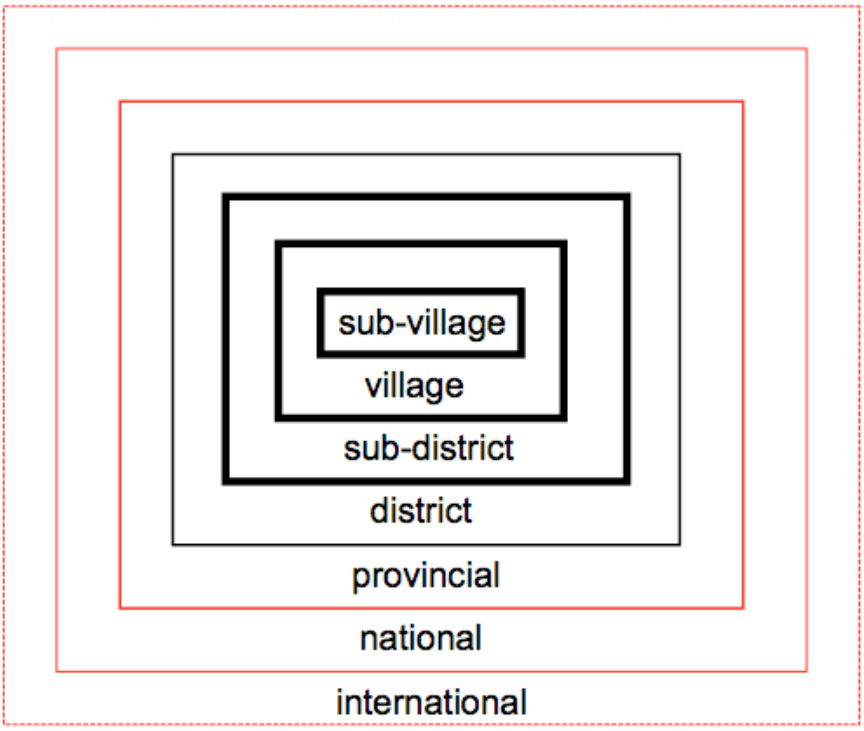

Figure 3b: *Contrasting Areal Domains of Ban Khor vs. Non-Ban Khor*

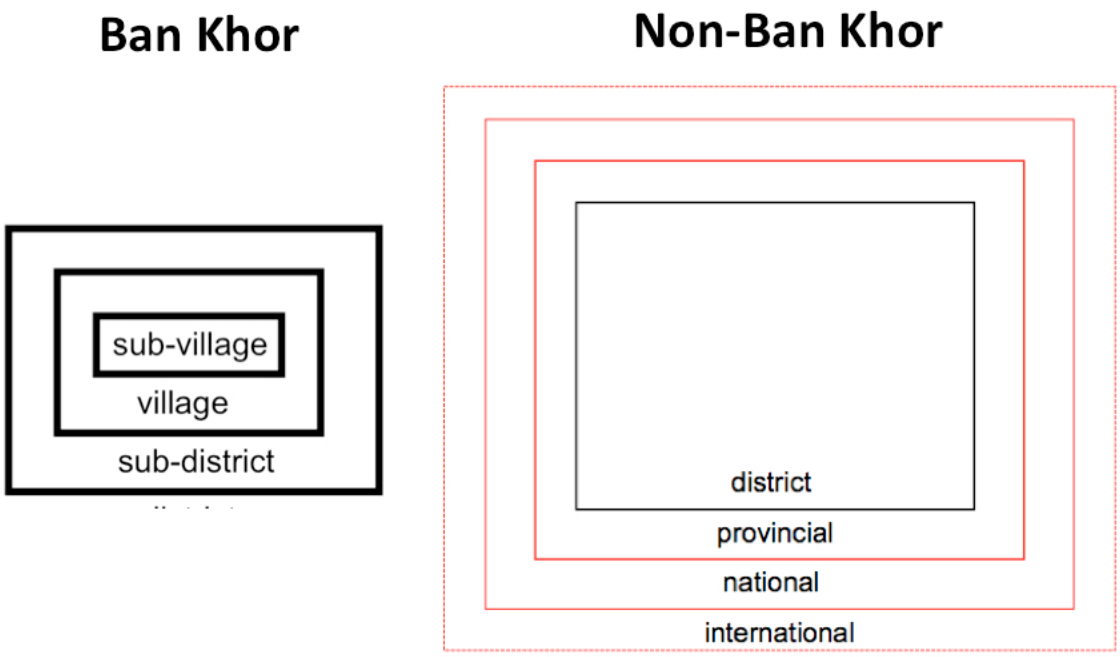

Figure 3c: *Contrasting Affective Domains of Ban Khor vs. Non-Ban Khor*

Ban Khor	Non-Ban Khor
• Home	• Not home
• I, my, we, our	• They, them, their
• Here	• There (elsewhere)
• Near	• Distant, far
• Local	• Non-local (vehicle or stay)
• Safe	• Scary, dangerous
• Comfortable	• Uncomfortable
• Clean	• Dirty
• Etc.	• Etc.

Figure 3d: *Generic Expression for Unnamed Places in BKSL*

GO (WAY) OVER-THERE

Since the community's founding in the late 19th century and throughout the 20th century, most villagers spent their entire lives in *Ban Khor*. Travel outside of the village and sub-district was rare, except for occasional trips to the district and provincial capitals and to those of the neighbouring district and province. In the 1980s it was uncommon but not unknown for villagers to leave the village for extended periods to work, primarily in Bangkok but occasionally in foreign countries in East Asia or the Middle East. By the 1990s greater numbers of *Ban Khorians* began traveling together to work an annual migrant labor circuit in Thailand. In the 21st century, especially within the last half-decade, those patterns have intensified dramatically, with many more villagers traveling frequently to more locations within the sub-district, district, province as well as to other parts of Thailand (Nonaka 2012a, p.289-90). These patterns provide important information for understanding the shared cognitive map undergirding toponyms in *Ban Khor* Sign Language.

Places are not only experientially but also affectively divided (Figure 3c) into the two basic domains of *Ban Khor* (and other relatively near and directly experienced locations at the sub-district, district, and home provincial levels) and non-*Ban Khor*. The first domain, *Ban Khor*, is associated with concepts such as: here, near, and local, with a strong positive implication of being safe, comfortable, clean, and so forth. The non-*Ban Khor* domain conveys contrastive notions associated with the 'Other', such as: outside the village, there (elsewhere), distant, far, and non-local (e.g., a distance so great it requires difficult and bothersome vehicular travel or

overnight stay outside the village), and implies an unknown that is often negative (e.g. scary, dangerous, crowded, dirty). Notably, similar affective mapping has been ethnographically documented in other small Thai village communities in northeastern Thailand (Mizuno 1971).[5]

Compared to written Thai, to any of the spoken languages used in the community, and to Thai Sign Language, BKSL's toponymic lexicon is small. Unnamed places—ones without a name sign—are generically designated as GO (WAY) OVER-THERE (Figure 3d). In such cases, the actual and/or affective distance from the speaker and from *Ban Khor* is indexed both by the size and intensity of the articulated sign and by the volume and degree of aspiration of the accompanying mouthings *bai* ('go') or *phoo* ('there' or 'over there').

Linguistically, BKSL toponyms have developed independently of other languages in the community. Thai village names follow a predictable form: *ban* ('village') + _____ [usually 1~2 words]. In BKSL, however, place names consist of a string of (quasi-) descriptive signs ending with a final, true directional or absolute point. This basic constructional pattern characterizes the signed toponyms for all other villages in *Ban Khor* sub-district. As the next two examples make clear, BKSL place name signs are unrelated to and exhibit very little, if any, influence from written or spoken Thai or any other language of the community.

Ban Khwang Klii ('ball game')[6] is a neighbouring village. In BKSL, however, the place name traditionally has been signed: SHOUT HIT-on-the-HEAD OVER THERE, the final point always toward the actual location (Figure 4a). Unrelated to the Thai name, the signed one is derived from a locally infamous incident: a party turned drunken brawl in which a man was hit over the head with a bottle. During the last decade it has become increasingly common for this toponym simply to be signed HIT-on-the-HEAD OVER THERE (Figure 4b). This type of shortening is associated with other place names and provides intriguing evidence of historical linguistic change in BKSL.

TURTLE OVER-THERE TEMPLE TURTLE OVER THERE (Figure 4c), a.k.a., *Ban Na Tao* ('village field turtle') is another community in the *Ban Khor* sub-district. Because both toponyms include the word "turtle," it is tempting to infer the place name sign was influenced by the written name. In fact, however, both the written/spoken and signed place names have been influenced by local topography, more specifically, by the many turtles at the large stream near the village. Additionally, *Ban Na Tao* is distinctive because for such a small village, it has an unusually large and beautiful temple. This distinctive temple is included in the BKSL toponym: the string of descriptive signs followed by THERE, with the final point in the actual direction of the community.

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5. In his anthropological study of the *Social System of Don Daeng Village—A Community Study in Northeast Thailand*, Koichi Mizuno observed that, "The inhabitants possess a feeling of living together, and identify themselves through its name or such stereotyped image [sic] as 'our village is peaceful and cooperative, having seldom nag len or gangsters, but many in other villages.' (Mizuno 1971, p.27).

6. The meaning of *Khwang Klii* is not transparent to many contemporary Thai speakers. However, based on conversations with two Thai academics it seems that *Khwang Klii* is a game or sport mentioned in old Thai folk tales like "Sang Thong (The Golden Conch Shell)." In this story, *Tee Klii* is a game played by the Hindu God *Indhra*, who transforms into a human being and comes to the Earth to play the game with a king. This game between the gods and men was baseball- like with a pitcher, a batter and a ball. *'Khwang'* means to pitch or throw. ('Tee' means to hit.) *'Klii'* refers to some sort of ball. Thus, for current purposes, I use the rather vague English translation, a "ball game."

Figure 4: *Three Examples of BKSL Toponyms for Known/Directly Experienced Places Beyond Ban Khor Village*

Figure 4a: *Version 1 BAN KHWANG KLII— an older and longer version of the sign*



SHOUT *HIT-on the-HEAD* *OVER-THERE*

Figure 4b: *Version 2 BAN KHWANG KLII— a newer and shorter version of the sign*


HIT-on the-HEAD *OVER-THERE*

Figure 4c: *BAN NA TAO—Another Village in Ban Khor Sub-district*




TURTLE *OVER-THERE* *TEMPLE*


TURTLE *OVER-THERE*

Figure 4d: *PHON SAWAN—District Capital*




MID-CHEST ..... *PHOTOGRAPH* ..... *MID-CHEST*

THERE

Place name signs for sites beyond the *Ban Khor* sub-district are formulated in the same basic fashion. *Phon Sawan*, the district capital, and *Khrungthep*, the national capital (a.k.a. Bangkok, as it is referred to in English) are two locations beyond *Ban Khor*. Driving by car from *Ban Khor*, it takes 30 minutes and 12+ hours to reach the two cities respectively. All community members will travel to the district capital several times in their lives in order to officially register births, marriages, deaths, etc.; and many villagers or their close kinsmen and friends will travel to the national capital to work for short or long periods. Thus, although *Phon Sawan* and *Khrungthep* are outside of *Ban Khor*, they are part of the community's shared experiential knowledge—communal knowledge that is reflected in the etymologies of their respective place name signs.

Phon Sawan ('little hill heaven') is signed MID-CHEST PHOTOGRAPH MID-CHEST THERE in *Ban Khor* Sign Language (Figure 4d). This name sign derives from the fact all Thai citizens must register at their district capital for a national identification card, one that includes a black and white headshot, that is, a picture of the person shot from the mid-chest upward.

Regarding the national capital, *Khrungthep* ('city of angels'), the underlying canonical form of this BKSL place name is: DRIVE/GO WORK (earn)-MONEY WAY OVER THERE. Until mid-way through the first decade of the 21st century, however, there was no superordinate word for 'work' in Ban Khor Sign Language.[7] Thus, there are at least two versions, and slight variants for each version, of this signed toponym; and use of a particular version strongly correlates with the sex of the speaker.[8]

Among female signers *Khrungthep* may be expressed as follows:

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7. When research on Ban Khor Sign Language began in 1996 and through the early 2000s until around 2008, BKSL signers expressed the concept of 'work' by signing one or more specific types of work, such as: SEWING, HERDING, LOGGING, CHARCOAL-MAKING, and so forth. With the exception the community's primary economic activity—rice agriculture—other forms of work are closely associated with sex and gender roles.

8. When talking about another person, his/her sex or travel and work experiences, may also influence language choice and use of either the WASH CLOTHES or LAY BRICKS versions of the BKSL signs for Khrungthep.

1. DRIVE WASH (clothes) WAY-OVER-THERE (Figure 5a)
2. WASH CLOTHES OVER-THERE (Figure 5b)
3. WASH LONG SLEEVE (clothes) WASH MONEY MONEY OVER-THERE (Figure 5c).

Receptively, male signers understand the preceding version and its variants, but they often produce another version of the BKSL toponym for *Khrungthep*. Men express the same basic descriptive strings but substitute LAYING-BRICKS for WASHING-CLOTHES. Etymologically, both gendered versions (and their variants) derive from the fact that over the years, numerous *Ban Khorians* have gone to the national capital to work and earn money: women working as live-in maids (WASHING CLOTHES) and men working construction (LAYING BRICKS).

Further analysis of the three examples in Figure 5 elucidates other interesting features of the BKSL toponymic onomastic system. Although *Ban Khorians* have some (in)direct experience with and knowledge of *Khrungthep*, the national capital is still remotely positioned geographically. This is evident from use of the sign DRIVE (see Figure 5a), which is often part of (quasi-)descriptive sequences of signs for far away places, because the distance is so great that travel by bus, van, truck, or car (versus motorcycle, moped, bicycle, or walking) is necessitated.

Comparative examination of the final indexical points in the examples in Figure 5 reveals another interesting aspect of the BKSL place names: the systematic deictic anchoring of all geographically remote locations in one of two possible experientially-near, quasi-local locations on the signing community's shared cognitive map. To reiterate, BKSL toponyms always end with a final deictic specifier consisting of an absolute point toward the actual location of the place vis-à-vis the speaker and *Ban Khor*. Yet the orientation of the final points shown in Figure 5 are not uniform.

Although all three of the language consultants were filmed in the same location and faced the same direction, two women point over their left shoulders (Figures 5a and 5b) whereas one points over her right shoulder (Figure 5c). This difference is not a performance error. To the contrary, it is entirely consistent with the organizing logic of the BKSL toponymic onomastic system. All three consultants' final points are absolute points toward one of the two provincial capitals where a *Ban Khorian* would go to catch a bus to begin the long journey to *Khrungthep* (Bangkok). In fact, those two provincial capital cities serve as the default deictic anchorings for the final points of all toponyms for far away places in *Ban Khor* Sign Language.

Figure 5: *BKSL Toponym for Khrungthep (a.k.a. Bangkok) - the National Capital of Thailand*

Figure 5a: *KHRUNGTHEP*

DRIVE

WASH (clothes)

WAY-OVER-THERE

Figure 5b: *KHRUNGTHEP*

WASH *CLOTHES* *OVER-THERE*

Figure 5c: *KHRUNGTHEP*

WASH *LONG SLEEVE (clothes)* *WASH*

MONEY *MONEY** *OVER-THERE*

**Evidence of language contact and shift, this is the TSL sign MONEY, whereas the preceding lexeme is the indigenous BKSL sign.*

Including *Phon Sawan* and *Khrungthep* (Bangkok), there are at least 10 fully conventionalized toponyms for non-*Ban Khor* locations.[9] Most (7) refer to neighbouring communities (e.g., sub-districts, districts and provinces) that *Ban Khorians* have first-hand knowledge of and to which they (have) actually travel(ed). A few (3) standard toponyms for places beyond *Ban Khor* refer to more distant locations (e.g., cities, provinces, or countries) that BKSL signers know of second-hand either from television or from stories told by/about fellow villagers who have visited those far-away places. In all cases, the basic linguistic form is the same as that of the previous examples: a string of descriptive signs ending with a point toward the actual location or toward one of the two cities where one would begin travel to distant sites beyond *Ban Khor*.

9. This is a conservative estimate based on the results of formal elicitation research described above in endnote 4. It is quite possible that in BKSL there are more place names for villages in other sub-districts contiguous to Ban Khor and for other communities scattered along the roads to Phon Sawan, surrounding district capitals, and to either of the two nearby provincial capitals. It is also possible that there are additional toponyms in BKSL for more distant locations, although that seems less likely.

When the need arises to discuss a place where *Ban Khorians* have no previous experiential knowledge and thus have no conventionalized name sign, the signer has two options. One is simply to refer to the place as GO (WAY) OVER-THERE (Figure 3d), in which case there is no final point or no specific deictic anchoring for the final point (e.g., a non-absolute point). Alternatively, the signer will produce an often long, quasi-descriptive sequence—one that invokes a common stereotype(s) of the place.

For instance, while many foreign tourists are familiar with the northern Thai city and province of Chiangmai ('new city'), it is an area that is largely unfamiliar to *Ban Khorians* and for which there is no fully conventionalized toponym in BKSL; however, two candidate answers include:

1. FEMALE BEAUTIFUL WAY-OVER-THERE *SAO* THEM MARRY AREA (Figure 6a)

   .....*SAO*.....

2. DRIVE *SAO* WAY-OVER-THERE *LONGAN* (fruit) BIG WAY-OVER-THERE (Figure 6b)

Both examples include the sign SAO, a term for a young woman, often an attractive young woman, in her teens or twenties. In Thailand, *Chiangmai* has a reputation for being home to many lovely women. For example, a Google search using the key words *'Chiangmai'* and 'beautiful women' yields the web address www.chiangmai.net, which describes *Chiangmai* as follows: "The city is famous for her friendly people, beautiful women, refined handicrafts, cool climate and stunning mountain scenery."

Figure 6: *Examples of Non-conventionalized BKSL Toponyms for Distant Non-Ban Khor Locations*

Figure 6a: *Version 1 of a Non-conventionalized Toponym for CHIANGMAI*


FEMALE *BEAUTIFUL*

*SAO**




WAY-OVER-THERE *SAO**


THEM *MARRY*



AREA

**SAO in BKSL (as well as in spoken Thai and Nyoh) is a gender and age-specific word for a young woman.*

Figure 6b: *Version 2 of a Non-conventionalized Toponym for CHIANGMAI*

DRIVE

*SAO**

WAY-OVER-THERE

LONGAN (fruit)

BIG

WAY-OVER-THERE

**SAO in BKSL (as well as in spoken Thai and Nyoh) is a gender and age-specific word for a young woman.*

Figure 6c: *A Non-conventionalized Toponym for VIETNAM*

TROUSERS

MACHINE GUNFIRE

TROUSERS

MACHINE GUNFIRE

WAY-OVER-THERE

Chiangmai is also famous for its *longan* fruit, and another Google search for "famous fruit of *Chiangmai*" produces the web address www.chiangmai-chiangrai.com/fruit-drinks.html. At that site, the following description appears: "By the time August arrives, the famous *longan* (a.k.a. lumyai) fruit appears, especially in *Lumpoon* (just south of Chiangmai), where a major yearly festival is held in honor of that fruit."

This stereotype is also invoked in the second gloss, *LONGAN* BIG (Figure 6b).

Although they are not yet fully conventionalized, the two preceding sign sequences for '*Chiangmai*' are not only quasi-descriptive but also include the final indexical points characteristic of BKSL toponyms. The final deictic specifiers depicted in figures 6a and 6b are made in different directions, but (like the earlier Bangkok examples in Figure 5) they are true directional points in that they index the nearest two hub cities where it would be possible to commence a long-distance journey.

Geographically and experientially, *Chiangmai* is quite far from *Ban Khor.* In both Figures 6a and 6b this is apparent both from the size of the final deictic points, which are so large they exceed the camera's lens, as well as by the accompanying phoo mouthings, which increase in volume, pitch and/or more aspiration to indicate greater distance. Emphasizing the fact vehicular travel is required to reach the location, the sign DRIVE (Figure 6b) again reinforces how far *Chiangmai* is from *Ban Khor.*

In *Ban Khor* Sign Language there are no fully conventionalized place names for foreign countries, except one. The Lao People's Democratic Republic is so geographically close that the place name sign is PADDLE (boat) WAY-OVER-THERE, and the last sign is an absolute point toward the closest city where it is possible to cross the Mekong River to Laos. If signers want or need to discuss international locations, however, they again do so either by 1) using the generic GO WAY-OVER-THERE (Figure 3d), or 2) using a quasi-descriptive string of lexemes derived from stereotypes of the non-*Ban Khor* location followed by WAY-OVER-THERE, a final point toward either of the two provincial capital cities where it would be possible to catch major public transportation that, after several transfers, would eventually enable travel to international destinations.

The example in Figure 6c is typical of this second pattern. It depicts a non-conventionalized place name sign that not only conforms to the basic linguistic organization of toponyms in BKSL but also reflects the logic of the language's underlying cognitive map vis-à-vis non-*Ban Khor* locations and imagined elsewhere(s). One candidate sign for Vietnam is TROUSERS MACHINE GUN-FIRE TROUSERS MACHINE GUN-FIRE WAY-OVER-THERE. Drawing on distinctive and widely known historico-cultural stereotypes, it invokes an image of a very different, non-*Ban Khor* sort of place: one where people wore/wear áo ba ba trousers (a two-piece shirt and trouser set of traditional Vietnamese clothing) versus classic Thai sarongs and where it was/is a war zone with rapidly firing machine guns.

More of the aforementioned long, descriptive sequences for far-away locations are appearing in BKSL, and a few (6) appear to be conventionalizing. Most of these emerging toponyms are for foreign countries that Ban Khorians are indirectly encountering via proliferating communications media or expanding travel experiences of fellow community members. Continuing creation of new BKSL toponyms of this sort, however, is becoming the linguistic exception rather than the rule.

Conclusion

Over the last decade, especially within the last half-decade, the community of *Ban Khor* has experienced dramatic economic and social change which is rapidly altering the traditional language ecology that gave rise to and sustained *Ban Khor* Sign Language. Heightened language contact with Thai Sign Language and the national Deaf community, in particular, are altering local language ideologies and patterns of language use. Language shift away from BKSL to TSL is now endangering the continued viability of the indigenous sign language.

These trends are evident in BKSL's changing toponymic ononmastic system. Younger BKSL signers (age 30 or below), for instance, are using a new sign for their own community. Depicted in Figure 7a, it is a calque of the spoken/written Thai toponym: BAN (home/village) and KHOR (a wooden clacker put around the neck of a water buffalo).

Far more common, however, is the trend of borrowing place name signs from Thai Sign Language, borrowing not only in the absence of but also despite the existence of indigenous BKSL toponyms — i.e., BANGKOK (see Figure 7b and compare with Figure 5). Abandonment of BKSL toponyms and replacement with TSL is not limited to this particular sub-lexicon. In recent years the rate and scope of vocabulary borrowing has increased dramatically across all lexical domains, including in core vocabulary.

These toponymic changes are indicative of more profound language shift away from BKSL toward TSL. Like too many indigenous languages around the world, *Ban Khor* Sign Language is now endangered. This is unfortunate because study of the language and its toponymic onomastic system provides rare insights into the contemporary etymological origins as well as natural processes of conventionalization and historical linguistic change of place names in a new language. Finally, in highlighting the richness of extant linguistic and cultural diversity, this case study also underscores what is at stake, that is, the potential humanitarian and scientific loss that results from escalating, world-wide language endangerment.

Figure 7: *Calquing and Borrowing—Evidence of Language Contact, Change and Endangerment*

Figure 7a: *New Calqued Sign for BAN KHOR in BKSL*

VILLAGE/HOME

*KHOR**

**khor = traditional wooden clacker hung around the neck of a water buffalo.*

Figure 7b: *Borrowed TSL Sign for KHRUNGTHEP (BANGKOK)*

KHRUNGTHEP (BANGKOK)

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Indigenous Sign Language of Far North Queensland

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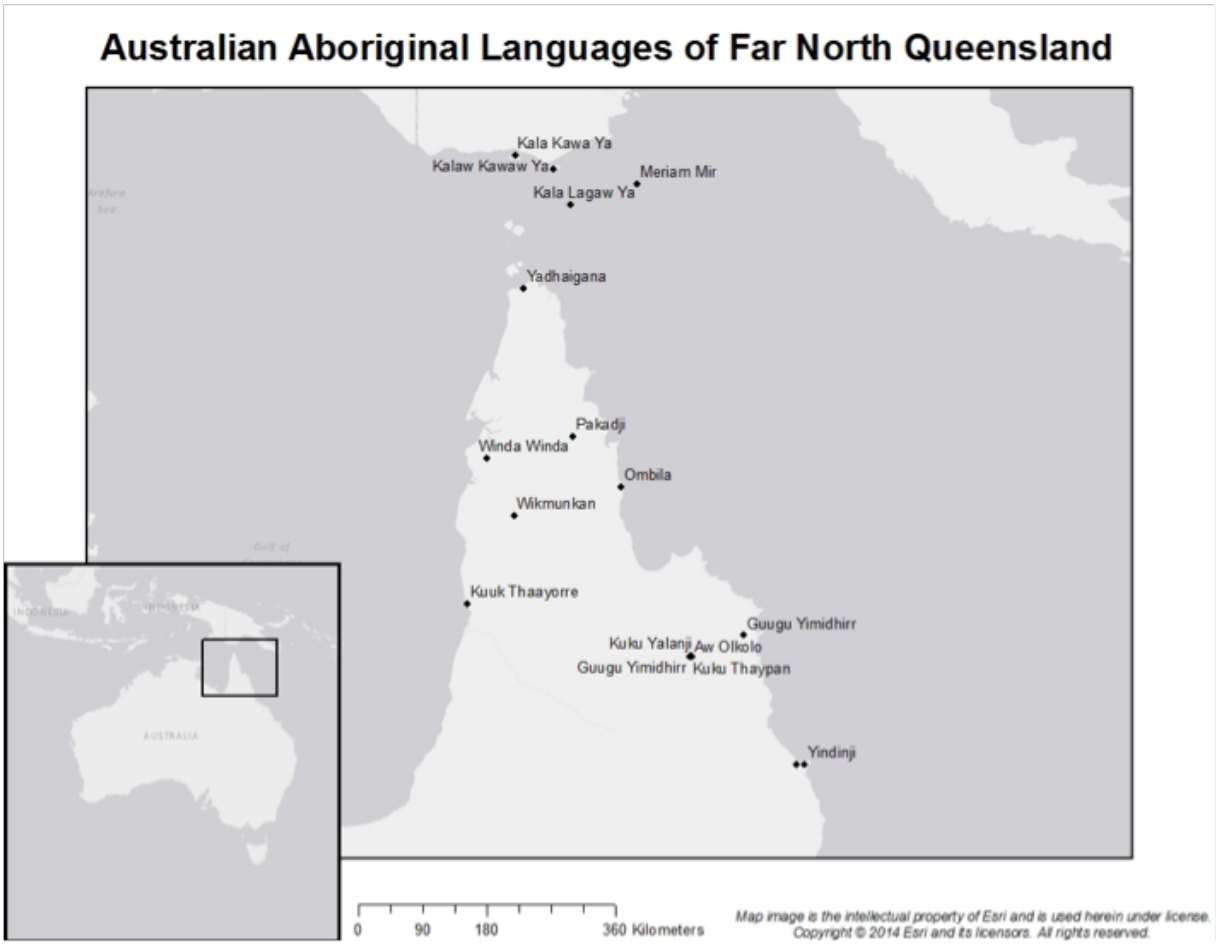
Introduction

Deaf Indigenous people living in urban centres of Far North Queensland (FNQ) claim to use a signed language system named Indigenous Sign Language or ISL. To date, there has been little investigation into both the origins and linguistic features of ISL. Consequently the language has been classified in the literature into the categories of either contact language (Johnston & Schembri, 2007) or idiolect (Fayd'herbe & Teuma, 2010). Nevertheless, Deaf Indigenous people in FNQ, who are the principal users of ISL regard their language as a functioning system of communication, derived from the Australian Aboriginal Sign Languages (AASLs) and Torres Strait Signed Languages used throughout the region. In this paper, new evidence is presented in two parts: Qualitative data elicited from a small group of Deaf Indigenous people outlining the social context supporting the acquisition of AASLs; and evidence from the ISL lexicon showing a direct connection between AASL, Torres Strait Signed Languages and ISL. The paper discusses the idea that ISL may be comprised of several contact languages, reflecting a mixed language environment that has mediated the preservation of AASLs in an environment of language decline.

The Deaf Indigenous Community of Far North Queensland

The Deaf Indigenous community of FNQ comprises people who reside in urban and remote community areas within the FNQ geographical boundary. This boundary extends approximately from Yarrabah in the south, west to West Cape York and north to encompass the Torres Strait Islands (O'Reilly, 2005). *Figure 1* is a map of FNQ showing the locations of spoken Indigenous languages mentioned in this study. Please note that not all spoken language groups are included in the map.

Figure 1: *Locations of spoken Indigenous Languages in FNQ*



There are approximately 35 Aboriginal languages spoken in the Cape York region among the various societies. However to the north of the Australian mainland lie a less known series of islands that comprise the Torres Straits. The traditional custodians of the Torres Strait Islands are of Melanesian descent whose traditional way of life prior to settlement was based on fishing, hunting, trade relationships, kinship, reciprocity and spirituality (Mina Mir Lo Ailan Mun, 2000). Present day Torres Strait life is modernised with tourism and trade of food, weapons and artefacts between Cape York communities and Papua New Guinea comprising a significant part of the Torres Strait economy. Linguistically, there are three main spoken languages in the Torres Strait and these include *Meriam Mir* spoken in the East, *Kala Lagaw Ya* spoken in the Central and West islands and *Kala Kawa Ya* is spoken among the northern islands. Over time, Torres Strait Island Creole has evolved as a *lingua franca* and extends across inhabited islands.

Cairns represents a main urban centre where many Deaf Indigenous people from Cape York and the Torres Strait Islands choose to live. Historically, it functioned as a centralised hub where many Deaf Indigenous community members resided as children to attend specialised schooling programs. Some of these deaf children were removed at a very young age, placed into “all-white classrooms” and were reported to have suffered traumatic effects as a result (Fayd’herbe & Teuma, 2010). The contemporary community however, is strongly connected with members enjoying many social and vocational activities. FNQ Deaf Indigenous people are politically active, have strong social justice values and many are involved in organising social events, for instance, the Deaf cultural dancing troupe called the *Deaf Indigenous Dance Group*

or DIDG. A proportion of Deaf Indigenous people have gained employment with Education Queensland in positions called Auslan Learning Models (ALM's) for the purpose of modelling ISL to younger Deaf Indigenous children and to act as a cultural bridge between the school and the home community. People in these positions are employed for their linguistic and cross-cultural competencies in that they can effectively function across multicultural and multilingual settings.

The Origins of Indigenous Sign Language

An important research question is whether the FNQ ISL used among Deaf Indigenous people is a derivative of the AASLs and Torres Strait Signed Languages used throughout the region. AASLs once proliferated across the Australia, however like their spoken counterparts, have faced decline since colonisation. It is estimated that there has been a decrease in the percentage of people speaking Indigenous languages from 100% in 1800 to 13% in 1996 (McConvell & Thieberger, 2001). Early documentation shows many of these languages had parallel sign language systems exemplified by the highly developed *Warlpiri* sign language of the North Central Desert area of Australia (Wright, 1980; Power, 2013). Like aboriginal spoken languages, AASLs are subject to dialectic variation, for example, those found in the Cape York region of North Queensland including the *Wikmunkan* on Western Cape and *Winda Winda* in the North Western Cape, are differentiated from dialects in the North Central Desert area (Kendon, 1988).

Historical observations of AASLs in East Cape York date back to 1908 (Roth, 1908). Roth reported a number of signs used by the *Guugu Yimidhirr* people of the Hopevale area. Sixty years later, West (1961-1965) corroborated this evidence with film footage of *Guugu Yimidhirr* women and men performing the same signs. Kendon observed that it was not likely that the Guugu Yimidhirr dialect was well developed stating that it was 'highly pantomimic and improvisational in character' (1988). By contrast, Kendon claimed that sign languages in the Northern Cape contained markers of a more developed language including one handed signing that used rapid hand differentiation. In these areas, the principle users of the sign language were characteristically hearing females whom Kendon deemed to be highly proficient.

The function of sign language lexicons in traditional aboriginal societies was contextualised to the cultural circumstance. In some instances, sign language was used as an alternate option to supplement spoken language use where speaking and signing occurred at the same time. This type of code mixing is known as *code blending* and has been studied in bimodal bilingual populations (Emmorey, Borinstein, Thompson & Gollan, 2008). Code blending is the ability to articulate signs and words simultaneously and Kendon observed this phenomenon where spoken instructions given by a bilingual mother to her children were accompanied by signing, most likely for emphasis (1988). In contrast to code blending, sign language was used in other social contexts to entirely replace spoken languages rather than function as an accompaniment. For instance, West (1961-1965) observed women in Northern Cape tribes such as the *Ombila* and the *Pakadji*, were required to observe cultural taboos for extended periods of up to one to two years' duration. In these cases, the requirement to follow strict cultural protocols meant sign language represented the dominant form of communication.

Situational demands may have supported flexibility in the use of sign language in traditional aboriginal societies allowing for switches between code blending and complete sign language use. Despite this flexibility, the AASLs observed in FNQ are regarded as *alternate* sign language systems as opposed to *primary* systems. *Primary* signed languages are those used by people (for the most part Deaf people) as their chief or in some cases, only linguistic form of communication (Kendon, 1988). By contrast, *alternate* signed languages are those used by people who are competent in at least one spoken language. Despite the fact that at times

AASL was the only form of communication for female hearing users, they were, for the most part, competent articulators of a spoken language.

The Use of Australian Aboriginal Sign Language by Urban Deaf Indigenous People

The extensive use of AASLs in traditional aboriginal societies throughout FNQ raises the question of whether deaf members employ these lexicons in a primary capacity. Given sign language would have been the principal mode for deaf individuals, it is arguable that they would have been exposed to the AASLs in use in their communities. There are no records of deaf aboriginal users of AASL in FNQ prior to European settlement however in this paper, new evidence is presented in two parts: Qualitative date outlining the social context supporting the acquisition of AASLs of a small group of Deaf Indigenous people; and evidence from the ISL lexicon that shows a direct connection between AASL and ISL.

The Social Context to Learning an AASL

In this section, qualitative data is presented from interviews conducted by the author with Deaf Indigenous community members. The interviews were held at a small gathering and informed consent was gained from all participants involved. PR is a profoundly deaf Aboriginal Elder from Laura in Cape York. The most prominent language spoken in Laura is *Aw Olkolo*, however other languages that are also spoken include *Kuku Thaypan, Kuku Yalanji and Guugu Yimithirr*. PR describes growing up with an AASL:

> *"It's a really visual language, and you just grow up out in that community and you know that it's normal because everyone does it, not just your parents. And when you become older, you realise that it's a cultural language, and it's a very old language going way back to even before white people came". PR then describes an experience with a hearing elder: "I remember I was with a group up in an aboriginal community in Cape York, and it was the first time that I was involved with that community of hearing people. There were also lots of aboriginal elders up there too. And one very, very old man said, "you come here" and I said, "me, you don't need me" and he said, "yep, come on, come on" and I knew that I had to respect him, and go up to him, and I didn't know how on earth I was going to communicate with him as I was the only deaf person there. He was talking about fighting for the land and I really didn't understand what he was talking about, but I knew I had to try and learn. Then he did a bit of sign and I was like 'wow' and said, "yes, yes" and suddenly we were communicating. He just didn't care that I was deaf; he said "come on, come on, I want you to learn about the culture and the land, and what we're here for in this meeting", and I was just so in awe, and he could sign, and it was just wonderful".*

Like AASLs, the signed languages used among the Torres Strait Island communities may also have been assimilated into ISL. Early reports made by Sidney Ray in 1907 during a Cambridge Anthropological expedition to the Torres Straits revealed extensive sign language use. Modern reports by Deaf Indigenous members who grew up in the Torres Strait Islands claim the sign language they use is derived from their hearing parents. For instance, SF is a profoundly Deaf member of the Badu Island community in the Torres Straits where the main language spoken is *Kala Lagaw Ya*. SF describes the origins of her sign language as such:

> *"ISL was there in the olden days, and they did pass it through the generations, the same as the spoken language. I mean, I know that my language is my own language*

> *that I've inherited from my parents, and I understand that other indigenous people have their own language as well, that they've learnt from their parents too. And when we talk to each other, we like to learn each other's language, definitely. But we do know that they're all different".*

The following experience demonstrates the use of ISL in the broader Deaf Indigenous community. AW is a profoundly Deaf elder from Saibai Island in the Torres Straits where the local language spoken is called *Kalaw Kawaw Ya*. AW spends her time residing between Thursday Island and Cairns. At a young age, AW was relocated to Cairns to attend school where the method of instruction was Signed English, an out-dated form of communication. In her adult years, AW developed proficiency in Auslan and she describes her experiences using Signed English, ISL and Auslan:

> *"ISL, I feel, is really comfortable for all of us (in the Deaf Indigenous community), and we were really like 'oh, we can't be bothered with white sign language'. And we would say 'why are you forcing us to do Signed English, or white sign language' and we were really confused and felt really uncomfortable about it. But we were always very patient and we knew that we'd have to go out and meet different people in the normal deaf community. And we'd have to change. It took about five years to change to Auslan signing. But lucky because I was very flexible, maybe because I already had ISL, I was able to learn it. And then we changed as well; we go from Auslan to ISL and then if we meet someone who is really strict with Signed English we have to change back to that to, but that's really hard. When we're signing here, we feel really comfortable".*

The experiences described by all three participants suggests ISL may incorporate the AASL and Torres Strait signs that Deaf Indigenous people have acquired from hearing signers in their respective home communities.

Linking ISL to AASLs and Torres Strait Signed Languages

The following figures depict signs in the ISL lexicon used by two members of the Cairns Deaf Indigenous community that are linked to signs from their respective home communities. *Figure 2* shows signs used by AW who resides in Cairns but originates from Saibai Island in the Torres Strait. AW is unique in that as a child, she acquired AASL from her mother who was raised in the Aboriginal community of Cherbourg in Queensland and Torres Strait Signed Language from her father who is from Saibai Island. In *Figure 2*, AW is signing the AASL and Torres Strait Signed Language variations for the sign *woman*.

Figure 2: *AW signs the variation for the sign "woman" on the left in AASL and on the right in Torres Strait Signed Language.*

Figure 3 compares signs used by a 19- year old Deaf Indigenous man (PC) with those used by an hearing Elder (MA), from the same remote Northern Cape community. PC resides in Cairns however originates from the community of Pormpuraaw in the north west of Cape York, a community where MA has lived for the duration of her life and is a user of the local language called *Kuuk Thaayorre*. Figure 3 shows PC and MA using the same signs for toilet, sister and nephew/niece. The AASL used by PC is likely to have been acquired during sign language contact interactions that occurred in childhood, prior to his relocation to Cairns. The similarity between modern usage of signs constructed in ISL and signs used in AASL is reflected in these figures.

Figure 3: *A comparison of signs used by young Deaf Indigenous Man and a Hearing Elder from the same remote FNQ community*

Toilet		
Sister		
Nephew / Niece		

In summary, the urban ISL users in this study have originated from several remote communities throughout FNQ. When they converse in ISL, they bring with them a combination of contact signed languages. The users describe a multilingual environment where interlocutors may code switch between Auslan and ISL. However, to what extent contact signed languages are exchanged and whether this occurs in a primary or alternate capacity, requires further analysis.

Discussion

In this paper, evidence has been provided demonstrating important links between signs used in both the AASL and ISL lexicons. Anecdotal evidence taken from Deaf Indigenous users of ISL show some acquisition of AASLs and Torres Strait Signed Languages from hearing members of the remote community from which they originate. In addition, when urban Deaf Indigenous people converge, the linguistic environment reflects a multilingual interaction of several contact languages with possible code switches between ISL and Auslan. The process of how AASL-ISL language transmission occurs, for example, whether through the converging of contact languages or via another mechanism, is an important research question. In addition, the question of whether Deaf Indigenous signers use ISL in a primary capacity as the result of language mixing also remains unanswered.

One possible answer involves the influence of the early schooling environment of Deaf Indigenous children. Recall that many of these children were exposed to AASLs before being relocated to urban centres for schooling. It is possible that the mixing of contact languages in this novel context gave rise to a developing ISL structure. Kendon observed such language extension in deaf people in remote communities, whom he claimed had developed their own language structure (1988). Moreover, a similar phenomenon occurred in the development of *Light Warlpiri*, where code switching between two contact languages transitioned into a *mixed language situation* (O'Shannessey, 2012). A mixed language emerges in a context of community bilingualism where structural and lexical elements from two source languages are combined to the extent that neither language is dominant. At this stage though, there is very little evidence to show that ISL involves a mixed language situation representing a limitation of the present study. Moreover, it is not clear whether the mixing of contact languages in the case of ISL comprises a mixed language or a simply lingua franca with borrowings of signs from differing AASLs and Torres Strait Signed Languages. Besides, there are other pressing issues including whether ISL is a language in its own right or a dialect of Auslan. What is certain is more research is required in order to elucidate the linguistic status of ISL. In particular, research into ISL at this time appears crucial given the possibility it has mediated the preservation of AASLs and Torres Strait Signed Languages of the FNQ region in an environment of language decline.

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