

## Looking at language: Appropriate design for sign language resources in remote Australian Indigenous communities

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*Anwern mpwarem iltyem-iltyemelh arelh mapel akwer maparl akaltyerreyek. Website-wern anwern arrernem. If inang website altywer-ilem, ina can arerl iltyem-iltyem nthakenh apek. Anwernenh akaltyantheh iltyem-iltyemek angerrepat mapel, anwernek imperl-alhek. Anengkerrant alkenty ina rrkwek angerrepat mapel ant hand-em over-ilerlapetyart, passing on anwernek. Lyet anwern want-em-errem akwerek pass em on-erreyek. We want to website-wern arrernerl anwernekenh angkety so they can iltyem-iltyem yanhek akaltyerrerl.*

All of us women are doing the sign language 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 handsigns are done. The old people 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 website so that the children can learn sign language (Janie Long Perrwerl, Hanson River, 29 June 2011).

### Introduction

Sign languages are in daily use in Arandic communities of Central Australia<sup>1</sup>. They are a form of communication used alongside other semiotic systems, including speech, gesture and drawing practices (Kendon 1988, Green 2009, Wilkins 1997b). Whereas sign languages used in Deaf communities may operate with little or no connection to speech, these 'alternate' sign languages are used in various contexts by people who also use spoken language. They are culturally valued and highly endangered, yet there has been little or no systematic documentation of these sign languages since Kendon (1988). In this paper we describe a pilot program that aims to contribute to the revitalisation, maintenance and promotion of Arandic sign language through

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<sup>1</sup> Arandic languages are spoken in the area of Central Australia roughly centering on Alice Springs. The Arandic group includes Northern & Southern Alyawarr, Central & Eastern Anmatyerr, Eastern & Central Arrernte (sometimes referred to as Mparntwe Arrernte), Western Arrarnta and Kaytetye.

documentation and resource development. We discuss our community consultations, field methodologies, and our annotation of video data. An initial goal is to make a web-based video dictionary for use in Arandic schools. This multimodal interactive resource comprises a searchable audio-visual database with sign and spoken language glosses and translations.

Although the creation and management of digital archives for primary sign languages is comparatively well-developed and has been discussed in the literature (see Johnston and Schembri 2006, 2011, Johnston 2010, 2011), ‘alternate’ sign languages have received little attention<sup>2</sup>. In Central Australia the repatriation and publication of sign language resources has moved from photographic representations of sign on paper (Wright 1980) to VHS cassette format, for example the Warlpiri sign language dictionary (Kendon 1986), and subsequently to CDs or DVDs with accompanying written texts<sup>3</sup>. When it comes to online resources for sign languages, comprehensive dictionaries of Australian Sign Language (Auslan), British Sign Language (BSL), American Sign Language (ASL) and New Zealand Sign Language (NZSL) are all accessible on the internet<sup>4</sup>. To our knowledge ours is the first attempt to create a searchable database of an Australian Indigenous sign language where the annotations are linked to the media, and to design and implement an online sign language dictionary. The resources created will benefit the community and a range of users (scholarly, archival, educational etc.), as well as satisfying community aspirations for medium and long-term engagement with their audio-visual language materials.

## **1. Project background**

Over the past six years the Batchelor Institute for Indigenous Tertiary Education (BIITE) has developed an intergenerational community language team to document linguistic and cultural practices and create appropriate resources to benefit the speech community. Carew and Woods (2008) and Woods (2010) have argued that key to moving forward and stemming the tide of language endangerment is energetic

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<sup>2</sup> But see work on Yolngu sign for the EuroBABEL project on Village sign languages ([www.esf.org/eurobabel](http://www.esf.org/eurobabel)).

<sup>3</sup> For example Farnell’s 1995 work on Native American Indian Sign Language (NAISL).

<sup>4</sup> BSL ([http://www.signstation.org/signstation\\_dictionary](http://www.signstation.org/signstation_dictionary)); Auslan (<http://www.auslan.org.au/dictionary>); ASL (<http://www.lifeprint.com/dictionary.htm>); NZSL (<http://nzsl.vuw.ac.nz>).

participation by speech communities and dynamic, creative collaborations which recognise and draw upon the broad range of strengths that exist within the community language team. An essential feature of this approach is the establishment of culturally sustainable options in mediating between old knowledge systems and digital technologies.

This sign language project builds on previous work conducted during a 2007 BIITE language workshop in Alice Springs where Alyawarr, Anmatyerr and Kaytetye students and their lecturers produced subtitled DVDs of a small number of signs using iMovie and iDVD. It was a process that produced an outcome in a short period of time, with minimum refinement but maximum participation. The first pilot site for the current sign language project was established at Ti Tree, a Central Anmatyerr and Warlpiri speaking community 200 kilometers north of Alice Springs.

## **2. Iltyem-iltyem angkety**

The Arandic communities are culturally similar to other desert communities in Central Australia and, as Kendon (1988) has noted, there are broad similarities in signing practice across the region, even if the forms of some individual signs differ<sup>5</sup>. Close observation of daily interactions in these communities shows that sign is an integral part of communicative practices. 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. Female bereaved kin may use sign to replace speech during extended periods of mourning, and for this reason it is the women who are assumed to be most knowledgeable about sign. All members of the community may use sign to supplement other modes of communication and to replace speech when talk is not practical or desirable. Signs are used in certain types of restricted ceremonies and in other situations where speaking is inappropriate. Sign is used when hunting (as noise would scare off prey); when giving directions; and for communication between interlocutors who are at a large distance from each other. It

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<sup>5</sup> Previous documentations of Arandic sign languages include Carl Strehlow (1915) with the Western Arrarnta, and Kendon (1988) with Anmatyerr and Kaytetye. Kendon recorded 400-500 signs for Anmatyerr and Kaytetye, compared to around 1500 for the neighboring Warlpiri (Kendon 1988: 95). Wilkins (1997a) estimates that there are 300-500 Arrernte hand sign items.

provides a means of conducting discreet side-conversations when public audibility could be a disadvantage.

Sign may also be employed for specific medical reasons (like aphasia) when a person has difficulty speaking, and for some speech and/or hearing impaired individuals sign is the primary mode of communication. Some are also taught and use Auslan, but in the community context traditional sign remains an important, and perhaps the main, means of communication for such individuals. As yet we do not know how the potentials of traditional sign and Auslan interact with each other in these communities (cf. O'Reilly 2006).

Speakers of Arandic languages have a number of ways of referring to their signing practices. *Iltyem-iltyem*, an Arandic adverbial term based on a reduplicated form of *iltya* 'hand', is glossed as 'using your hands to communicate, either using hand signs while talking or using hand signs alone'. In Arandic languages signing is referred to in various ways including *iltyem-iltyemel ilem* (*ilem* 'say, tell'); *iltyem-iltyemel angkem* (*angkem* 'speak'); *iltyem-iltyemel apawenhem/ingwem* (*apawenhem/ingwem* 'ask'); *akerter ilem* (*akerter* 'not speaking', *ilem* 'say, tell'). In the Kaytetye language signing is referred to as *eltyetheye angkenke* (*eltye* 'hand', *+they* 'from', *angkenke* 'speak') or *akerteretheye angkenke* (*akertere* 'not speaking, unable to talk', *angkenke* 'speak'). In Central Anmatyerr sign the practice is referred to by first signing HAND then TELL.

### **3. Research design and methodology**

There is no doubt that new forms of digitally-mediated social interaction are impacting upon social and cultural practice, communication styles and learning processes in remote Australia (Kral 2010a, 2010b, 2010c). Research into various aspects of multimodal communication brings with it many theoretical and practical challenges. New technologies and the ever-expanding potential of data annotation systems create a plethora of choices. The use of film in language documentation has become much more commonplace and linguists are increasingly using the medium as a way to capture the complexities of speech, gesture and sign in real-world language use (cf. Cash Cash 2007). When the visual is foregrounded, as it is in sign and gesture research, additional layers of complexity are added that impact on all aspects of the documentation process.

In our field recordings we aimed to balance the objective of recording naturalistic visual data with the desirability of visually ‘clean’ images that make annotation and analysis easier and which look good online. There are lessons that linguists can learn from ethnocinematographers (Dimmendaal 2010) but we also need to adapt film technologies to meet our own particular ends.

Maintaining ‘respect for the dignity and aspirations of community participants’ (Cash Cash 2007: 14) is a fundamental principle in the documentation process. Coupled with the documentation part of the sign project is an introduction to some of the issues inherent in publishing material online—such as privacy and rights. These dual objectives, of doing scholarly research on Arandic sign language and of testing the usability and benefits of some of the products of this research, informed the planning of the online resource development. As discussed below, the project development cycle became a series of shorter iterations rather than one long single cycle.

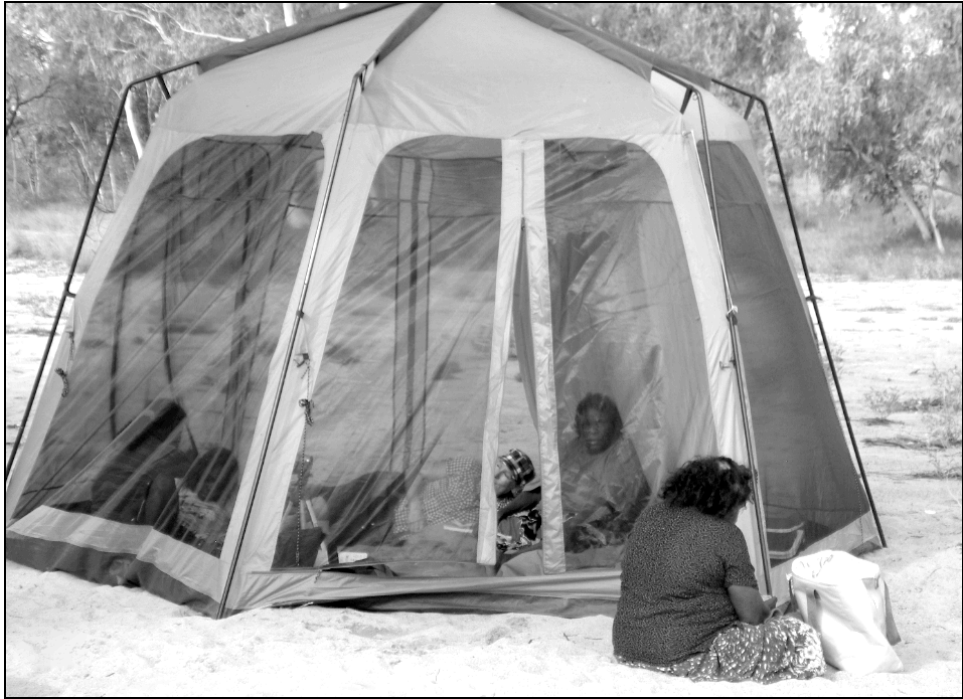
#### **4. The signadome - recording handsigns in the bush**

It is difficult to balance the desire for data that is ‘ecologically valid and representative’ of everyday speech, sign or gesture (Seyfeddinipur 2006: 56) with the rigour required if primary data is to be verifiable, and thus able to yield insights that are generalisable beyond the single occurrence of their documentation. To meet the challenge of recording clear images in a diverse range of community, geographic and light/weather situations we established a makeshift studio affectionately dubbed the ‘signadome’ (Figure 1). This large hexagonal mosquito dome was modified so that a backdrop could be hung inside, thus simulating in the bush the uniformity of background colour achieved in more standard laboratory conditions, and seen on websites of primary sign languages such as ASL, Auslan, NZSL and BSL<sup>6</sup>. We experimented with various fabrics and colours and finally settled on sky-blue polar fleece—the colour was bright and attractive and the fabric did not crush. The kit was completed with cushions and an ochre red-coloured canvas groundsheet. The signadome had some unexpected advantages: it provided a discreet and dedicated workplace, and it gave some protection

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<sup>6</sup> Preferences for background colour vary on these sites. BSL Signstation and Auslan Signbank both have blue. Various ASL sites use either black or grey. Schembri (2010: 132) notes that ‘pale colours in the background make it very difficult to see the hand-shapes of fair-skinned signers’.

from sun, flies and mosquitoes. With the addition of lengths of fabric attached to the outside by bulldog clips the space could be totally in shade, and their placement adapted to deal with fluctuating light conditions. There were some disadvantages: wind sometimes gave the visuals a flappy look (and impacted on the sound). The space is slightly constrained and will need to be modified if we are to successfully film more than one signer at the same time. The blue backdrop curtain was also used in other recording locations when the tent was not needed.



**Figure 1:** Signadome set up in the Hanson River, Central Australia, March 2011

Those who are inexperienced in photography in desert light conditions may record images where the background is over exposed or there are impenetrable dark shadows on people's faces. By controlling the light situation during filming we were able to achieve images that had a uniform 'look' across our data set. The diffused light in the signadome resulted in film where the exposure on signers' faces and hands was consistent. Cultural value is attached to images that appear as 'bright' or *aketh* ('clear, open') and there is a negative view of images that have sharply contrasting blocks of dark and light that obscure the details of faces. There is also a practical scientific interest in achieving uniform images of sign with a minimum of visual clutter. Sign

annotation is made easier if the hands can be seen clearly. In addition to this, video can be compressed more efficiently for online delivery if movement and image complexity in background areas is kept to a minimum. Although we did not go so far as to introduce a regular sign uniform (cf. Schembri 2010), we did provide ‘hoodies’ and T-shirts of various plain colours that signers could choose to wear if they wanted. However, we felt that it was important to not override the vibrant style of dress so apparent in desert communities.

The sign elicitation set was based on a group of approximately 500 words arranged in semantic domains similar to those found in the IAD Picture Dictionary series. The first picture dictionary was developed by Green with Anmatyerr people (Green 2003)<sup>7</sup> and the dictionaries include basic vocabulary; well-known plants and animals, kin terms, frequently used verbs and some common expressions. The objective of using graphics in the design of the sign website dovetails with the semantic domain-based categories established in the Picture Dictionary series. We aim to re-affirm some aspects of this format in the sign website design, maximizing the usability of both in education. In addition to these items, the elicitation list was enhanced by documentations of sign made by Strehlow (1915), Kendon (1988) and Wilkins (1993/1994). Although this list is clearly not exhaustive, it provided a starting point.

The elicitation sessions were conducted in local languages, in this particular instance Central Anmatyerr, but generally *not* in local sign. We also tested the use of visual media as a tool for eliciting sign by playing film clips on an external computer monitor and filming signers’ commentaries on the unfolding action. Our source material included a set of video clips developed by the Max Planck Institute for Psycholinguistics (MPI) to investigate cross-linguistic properties of reciprocal constructions (Evans *et al.* 2004, 2011)<sup>8</sup>, and clips of Australian rules football games accessed on YouTube<sup>9</sup>. The sign data thus generated was back-translated by playing the footage to a signer who was not present when the first recordings were made, and filming their sign and speech interpretations of the video material. We also filmed sign

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<sup>7</sup> Based on this initial template, there are now nine of these dictionaries for languages in Central Australia, with two more close to publication.

<sup>8</sup> <http://fieldmanuals.mpi.nl/volumes/2004/reciprocals/>

<sup>9</sup> Some signs for the BSL Corpus project were elicited by using Powerpoint slides showing a picture and an English word (pers. comm. Adam Schembri to J. Green).

in the context of other narrative practices such as sand drawing (Green 2009) and we recorded a Warlpiri and an Anmatyerr sign version of the Ti Tree Community Language Team's 'baby board books' (TTCLT 2010a, 2010b).

The elicitors were linguists and local community members, and they sat behind the camera so that the line of sight of the signer corresponded to the camera as surrogate 'interlocutor'. As the great ethnographic filmmaker Jean Rouch commented, 'When you observe people, you're automatically present and there's nothing you can do about it' (Rouch 1978). Eye contact was maintained between the participants in the recording sessions and this made for more expressive demonstrations of sign. In some cases the camera operator and the elicitor were one and the same, and on other occasions the elicitation sessions became lively group collaborations that drew on the multilingual and multimodal skills of all present.

We filmed with one camera (Panasonic HDC-HS900) attached to a tripod and orientated to capture the signing space around the signer. Although this tended to be contained within the space in front of the body and to the sides, sometimes it was necessary to re-position the camera to film the full extension of the signer's arm above their head (e.g. for the sign CLIMB) or for deictic gestures/signs expressing distance and in which it is clear that arm elevation is an important parameter (Kendon 1988). We captured the cycle of the signer's hands from a position of rest, through the various phases of the expression of the sign or of a series of signs, and then back to rest again. Signers were seated, generally cross-legged on the ground, in contrast to the standing position frequently evident in formal recordings for online dictionary clips seen in recordings of primary sign languages. As some Arandic signs are articulated on parts of the body, for example the knee or the thigh, it was important that the signer's entire body was filmed. The signer was positioned in the centre of the frame, and as such violated various film conventions such as the 'Law of thirds'<sup>10</sup>. Figures 2 and 3 show stills taken from the video data.

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<sup>10</sup> The 'Law of thirds' divides a film, photo frame, or visual image into nine equal rectangles by superimposing two equally-spaced imaginary horizontal and vertical lines. The four points where the horizontal and vertical lines intersect are said to be the most interesting points in a photograph. In sign language and gesture documentation the need to make sure that the video captures the entire signing space overrides some aesthetic considerations that may be considered important in film-making.





**Figure 2:** Eileen Campbell Perrwerl signing INARLENG ‘echidna’

**Figure 3:** April Campbell Pengart signing ARENG ‘euro’

The single word elicitation prompts generally led to rich multi-sign utterances. While on occasion signers involved in this project signed without speaking, there were many examples when sign was accompanied by speech. No doubt this was in part a reflection of the elicitation process itself, however, as stated above, co-speech signing is one of the ways that sign is used in Central Australian communities. Recording both sign and speech added a dimension to our annotation processes not so apparent in primary sign language research. Co-occurring speech was recorded with an external microphone mounted on the camera or with a lapel microphone. The majority of the recording sessions were with individual signers, although as the research proceeds we will record sessions where there are two or more signers. In the future we plan to record more spontaneous conversational sign data, and we will use a second, and perhaps a third, camera to ensure that there is clear film of all interlocutors<sup>11</sup>.

## **5. Editorial chunking during content acquisition**

As videotape-based cameras are phased out, and hard drives or SD cards become the dominant recording medium, researchers are faced with new opportunities for content acquisition, media editing and storage. The recording of the sign data to hard drive rather than to tape provides a range of camera-operator options for segmentation that

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<sup>11</sup> The BSL documentation project used up to four cameras (Schembri 2010: 131).

have previously been in the domain of the media capturing and editing process. Ingesting media from tape allows an editorial decision-making process to chunk filmed sessions into smaller segments (say, for working with in ELAN). With many drive-based cameras recording sessions can be split into discrete clips by pausing or stop/starting during the filming itself. During our first recording sessions we took advantage of this as a way of reducing the post-production trimming required to isolate signs or sign utterances. The hard drive camera was paused at the end of each elicitation segment, creating multiple clips (for example in one session 158 utterances = 158 media files). Although the ease with which discrete clips could be generated on the camera held some initial appeal, the proliferation of files had implications for efficient use of ELAN search functions, and keeping track of enormous numbers of files and their metadata can be problematic<sup>12</sup>. In subsequent filming sessions the camera was paused less frequently, creating larger files comprising multiple sign utterances. These larger files inevitably include more spontaneous and unplanned data (cf. Himmelman 1998:180), and they did not rely solely on the camera operator's on-the-spot intuitions about the beginnings and ends of sequences of sign production.

In this first phase of the project we have recorded an estimated total of 400-500 signs, mainly in Central Anmatyerr, but also including some Warlpiri, Kaytetye and Alyawarr signs. This has generated around 800GB of data and over 1100 separate film clips, ranging in length from 3 seconds long to 25 minutes (approximately 20 hours of recording in total)<sup>13</sup>. There are numerous examples of single signs but also many of complex sign sentences, comprising up to five or six signs.

## **6. Storage, backups and data sets**

The first sign footage was recorded as .mts files with a hard drive camera. The footage was captured from camera as high definition .mov files using the Log and Transfer

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<sup>12</sup> Although there appears to be no limit as to the number of files that can be included in an ELAN search of multiple .eaf files, complex searches require more RAM (Han Sloetjes pers. comm. to J. Green).

<sup>13</sup> As a point of comparison, the Auslan Archive includes data collected from 256 participants, and the Endangered Languages Documentation Programme (ELDP) corpus subcomponent deposited in the Endangered Languages Archive (ELAR) at SOAS contains 1,100 video clips (Johnston 2011: 3). This represents around 150 hours of digital video. Data from the Sociolinguistic Variation in Auslan Project (Schembri *et al.*, 2009), which also forms part of the Auslan Archive, has about another 150 hours of video (Trevor Johnston pers. comm. to J. Green, August 2011).

function in Final Cut Express (FCE). These were then transcoded to .mp4 files for ELAN annotation, web publication, for archiving and for backing up. The files were named in the Log and Transfer process and this naming was carried across to related file types (.mov, .mp4, .eaf). The file names include some metadata: the date of the recording session, the clip number, and a signer ID. The working media set and backup set were duplicated, and held in different locations. This workflow allows FCE and ELAN to each work efficiently with optimised media, although at the expense of the storage space needed to hold the two sets of media data. Predictably, this all results in a lot of media, however the duplication enables synchronous research processes and provides off-site copies of the media. The data sets are mirrored after new filming sessions to maintain currency. For the second test site (set up in August 2011), a selection of clips was edited in FCE and uploaded to a video streaming site.

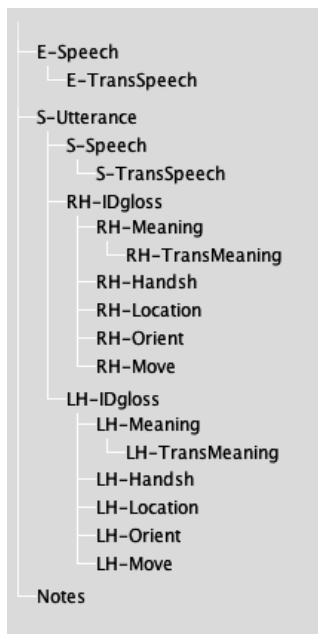
In future the media workflow may be adjusted to reduce the number of media sets generated. Alternative methods for naming and ingesting the media from camera to computer without the data overheads that FCE brings are being trialled. We hope to see dramatic reductions in the amount of hard drive space required to store and backup the media, reducing the project's data storage costs and minimising potential media management issues.

## **7. Annotation of data**

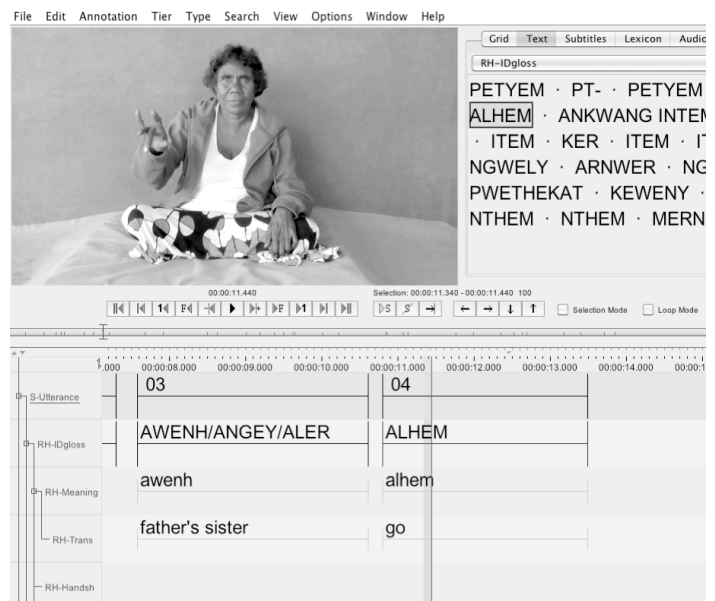
Our aim is to design an annotation process that enables us to answer some important research questions, some in the short term and some beyond the scope of the current project. We are constantly juggling the short- to medium-term aspirations of the community whilst endeavouring to foreshadow the longer-term potential of ongoing research. As is the case with primary sign language corpora, full annotation of our data, even the corpus already amassed, will take an enormous amount of time. It is clear that 'the creation of digital archives of signed languages is challenging, time consuming and expensive' (Johnston and Schembri 2006: 12, 15). Our first priority is to be able to assess the extent of sign language knowledge, to make efficient language internal analyses, to be able to make comparisons between Arandic language groups, individuals and communities and ultimately to provide access to sign data via a website

with time-aligned text and video presentation. We also aim to provide feedback from this growing corpus of sign for ongoing fieldwork in sign documentation.

The data is annotated using the ELAN (Eudico Linguistic Annotator) digital video software<sup>14</sup>. ELAN enables multiple user-defined levels of annotation that are time-aligned to the visual and audio media, and it is rapidly becoming a standard tool in sign language research (Schembri 2010: 114). Amongst many other features, it has the capacity for complex searches to be carried out across multiple annotation files. Our ELAN template design (Figure 4) will be used for annotating all the sign data, even if only several levels of annotation are accomplished initially. We recognise also that annotating sign language is necessarily a staged process and whilst we endeavour to project future research possibilities, the optimum number and type of tiers is not yet finalised. A screen-shot from an annotation file is shown below (Figure 5).



**Figure 4:** ELAN annotation template showing hierarchical structure of tiers



**Figure 5:** Screen image from ELAN annotation file

Whilst signers do not always speak as they sign, one of the significant differences between our sign language data set and those of primary sign language corpora is that it

<sup>14</sup> <http://www.lat-mpi.eu/tools/elan/>

includes a high proportion of co-signing speech. With the idea of being able to identify and stream coherent units ‘based on meaning or delivery’ (Johnston 2011: 10) the primary constituent in our data set was defined as a multimodal ‘composite utterance’ that potentially includes both speech and sign (S-Utterance). S-Utterances typically commence in response to an elicitation cue, and they are delineated by changes of theme and by the beginnings and ends of theme-related speech and action. An S-Utterance may include sign that is closely aligned with speech, sign only, or sign/speech composites that are less closely aligned. In some cases the speech and sign meanings are closely related, and in others not.

The data is annotated in series of passes. The first tasks include chunking the signer’s utterances, transcribing and translating their speech, and segmenting utterances into sign units. The speech of the elicitor and its translation are then entered. In the data we have instances of individual signs occurring in isolation and of signs occurring in a continuous stream of sign. We employ the following guidelines to identify the beginnings and ends of a sign (see Johnston 2011). A sign starts when:

- The hand or hands move from the rest position (in our data often on the signer’s lap)
- The hand or hands start to change direction or the handshape changes
- There is a change of handedness

A sign ends:

- Just before the hand or hands start to change direction or the handshape changes
- When the hands return back to a rest position
- Just before there is a change of handedness (this may occur for example, when a signer repeats a one-handed sign with the alternate hand)

The advantages of uniquely identifying signs based on their form rather than their meaning and of developing individual sign ‘ID glosses’ have been discussed in the context of work on the Auslan corpus (see Johnston 2010, 2011). One of the reasons given for this is that a given Auslan sign form may be used in more than one type of

syntactic slot (Johnston 2011: 10). In the Auslan case the ID glosses are based on entries in Signbank, the online Auslan lexical database<sup>15</sup>. In our work on Arandic sign we are clearly several steps behind this—we do not yet have the equivalent of a lexical database of signs, although one of the aims of the documentation process is to compile one. The need to separate a sign’s ID gloss from its meaning is particularly important in these alternate sign languages as signs are often highly polysemous (see Wilkins 1997a, Kendon 1988)<sup>16</sup>. For example the sign for ILTYANG ‘hand’ and for INGKANG ‘foot’ is the same in Anmatyerr. The sign for a person’s AWENH (‘father’s sister’), their ANGEY (‘father’) and their ALER (‘nephew, niece’) is the same in all of the Arandic sign languages that we have surveyed so far.

As we will not be able to build up a complete picture of the mappings of sign form to meaning until the documentation project has progressed further we provide three levels of identification for each instance of a sign (see Figure 4). The first, the sign ID gloss, is written in upper case, and it may list alternative spoken language equivalents for the sign, separated by a forward slash (see Figure 5). Sign ID glosses do not indicate grammatical class and verbs are glossed using the citation form, in keeping with the Anmatyerr to English dictionary (Green 2010). In a later stage of the research project we may introduce numbers as unique identifiers for signs. At the second level of annotation the meaning of the sign in the particular context of the sign utterance is entered, and finally the English translation of the meaning.

Remaining tiers that encompass significant aspects of the articulation of individual signs: ‘handshape’, ‘location’, ‘orientation’ and ‘movement’<sup>17</sup>, will be annotated in later stages of the documentation project.

## **8. Website design, publication and goals**

Website development can typically follow a linear timeline of analysis, design, content production, development, testing, implementation, and maintenance. This involves a significant time and financial investment in the development stages, and is heavily based on having high-quality and well-defined outcomes from the initial analysis and

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<sup>15</sup> <http://www.auslan.org.au>

<sup>16</sup> For example, in Carl Strehlow’s description of Western Arrarnta, approximately 280 signs were equivalent to 454 spoken language terms (Strehlow 1915).

<sup>17</sup> See Kendon (1988: 100-101) for discussion.

design stages, and unchanging needs amongst the user group. For the Arandic sign project, awareness, abilities and expectations of the resource's primary potential users (the language speakers) are rapidly growing and changing. To commit to a long development process without user feedback could result in building a resource that is out of date before it is complete, or a resource that is not used at all. In the Arandic sign language project we are proceeding incrementally, returning smaller community projects early on for feedback and adaptation. Thus the user journey within the online resource can be grown from real experience rather than modelled on imagined behaviour.

In Central Australia the use of digital video in the field is widespread for a range of different purposes such as the documentation of Indigenous ecological knowledge, recording of ceremonies and country visits and publishing of traditional and contemporary stories<sup>18</sup>. Invariably the DVD format has been used for the repatriation of such language and culture materials and consequently Indigenous people in remote communities have become familiar and comfortable with DVD technology. DVDs, however, can be ephemera. In remote communities there is seldom a reliable repository to store them in the long-term; they quickly become scratched, get lost or lose their covers and ultimately end up in the trash. While younger people are now more likely to have laptop computers or DVD players, or at least some way of accessing them, it is often the case that the senior people whose knowledge is so carefully being recorded do not. On some occasions the only meaningful way to return cultural material is to also provide the equipment to access it on.

Countering the benefits of the familiarity that DVDs offer are their cumbersome methods of navigation and limited opportunities for interactivity. Our first trial sign website began to test the interactive potential of a website compared with a DVD, and to test navigation and learning design issues. The content structure was based on the semantic domains in the picture dictionaries. It included key words in Anmatyerr and in English, line drawings, and corresponding sign clips. Users could access content through either an Anmatyerr or an English word search, by semantic domain, or by sign hand shape. We also began a process of checking approvals and protocols for publishing videos online and of building community awareness of the online resources

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<sup>18</sup> For examples see Turner & Woods (2007), and UsMob (2005).

with the intent of empowering people to engage with online content as owners and creators rather than simply as consumers.

We continue to monitor internet access in various Arandic communities in the area, and investigate the suitability of network speeds and access to internet-enabled devices. These checks confirm that the domains of use are variable; that there are low levels of personal computer ownership, very few functional community internet cafes, and only limited informal internet access through schools, knowledge and study centres and libraries. There are, however, high rates of phone ownership in Central Australian communities and many people have access to the internet via their phones. Although 'it is not yet clear what level of connectivity will be provided to remote and very remote communities under the National Broadband Network' (Featherstone 2010: 53), efforts need to be made to increase people's readiness and internet-savviness in preparation for the opportunities that future upgrades to network infrastructure may bring. Potential infrastructure upgrades alone won't increase people's online engagement; there must be relevant content with which to engage.

Alongside the development of the first trial website, we set up a Tumblr<sup>19</sup> blog to assist in recording the project progress. The blog also works to familiarise speakers/signers and community members with the interactivity potential that a website could afford. Some of the blog posts have been created at Ti Tree in collaboration with project participants. Examples of material that has been approved for public access are displayed, providing an opportunity to promote the richness and vibrancy of language and cultural practices to the general public.

We continue to explore details of appropriate technology, navigation and learning design for the website. Visual design considerations that have arisen from the first sites include the optimal arrangement of videos for signs for which we have examples from multiple signers (stacked, or cropped and set side-by-side) and the value of having close-up videos of hands to complement the full body shots. Another option that we are exploring is to present, adjacent to the video of the signer, an optional web-camera video feed of the viewer. This would enable the viewer/learner to mimic the sign demonstration and view the results, and it may have some useful teaching

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<sup>19</sup> Tumblr is a microblogging platform that allows users to post text, images, videos, and audio online ([www.tumblr.com](http://www.tumblr.com)).



applications. One consideration that needs to be tested more is whether to present the learner's web-camera feed in either a mirrored or a horizontally flipped orientation. When the sign video is presented onscreen, does the learner move their left hand to mirror the signer's right hand, or do they use their right? If the learner's mirrored web-camera feed shows their left hand moving this process 'appears' correct, but for signs where handedness is important it may set up incorrect learning of the handedness of the sign.

Future site mockups will test the publishing potential of using the timecode-aligned text attributes of HTML5 video presentation. HTML5 also presents opportunities for simple annotation functionality to be added to videos, giving the database great potential to grow from the addition of user-generated content, whereby the sign data could be added to online. Future website mockups will also test the technical and interface potentials for people to record new signs, add new recordings and transcriptions to existing sign entries, and upload contextual information and media.

## **9. Discussion**

The initial responses in the Ti Tree community to the website have been very positive. Participants commented favourably on the design and on the video images, and gave detailed instructions about their preferences for the 'look' in terms of image brightness. Indigenous teachers tested the website in the classroom with Smart Boards (interactive whiteboards). Significantly the first discussions about access conclude with no requirement for restrictions, either at a local or at a broader level. Anmatyerr people are also making suggestions that point to some specific issues relating to web design for such small-scale communities. For example having clips of several signers on the website is seen as an advantage as it maximizes the engagement of users, who will be able to choose to view their own close relatives in the sign demonstrations. They are also discussing the idea of local users being able to temporarily de-activate parts of the site in response to communities' decisions during periods of mourning. Whereas in the past the cultural practice was to remove images of deceased persons from public view, or destroy them altogether, these traditions are rapidly changing. There is also

enthusiasm to make the site multilingual in Anmatyerr and Warlpiri spoken language and sign.

It is essential to balance both short to medium term goals (for example creating teaching and learning language resources) with the long-term goal of detailed documentation. Thus we aim to create long lasting records and rich, accessible products that serve multiple purposes. By creating products that are functional but also aesthetically pleasing we can promote and further understandings of endangered languages and of specialised communication and performance genres in the broader public arena. There are great opportunities to expand the usefulness of existing language and culture learning materials by adding multimedia and by using the potentials of online resources in creative and culturally appropriate ways. Art and multimedia are powerful tools in language and cultural maintenance as they enable people to explore, express and reaffirm traditional knowledge. Media production enriches and expands language documentation, opening up new and sometimes unforeseen directions, and it provides great opportunities for training in media skills.

Another recent sign language example from Central Australia is the collaboration between Warumungu and Warlmampa elders, younger people with some media training, Central Land Council (CLC) staff, and a trainer, to produce a DVD about signs and ecological knowledge (CLC 2011). Rather than the more structured model of data collection that we have been following, this DVD product presents select signs in the context of bush trips organised around particular themes: *wirrkali* ('bloodwood tree'), *wurtilla*, ('bush bean'), *miyaka* ('Kurrajong tree'), and the healing properties of smoke. In the beginning stages of the Arandic sign language project, other ways of capturing and thinking about sign were explored alongside the more formal elicitation sessions in the signadome. Sign language 'portraiture' and a series of 'signed' prints were produced in response to the theme and in collaboration with the art department at BIITE. Figure 6 shows an example.



**Figure 6:** Self-portrait signing AHAKEY (Bush plum, *Canthium latifolium*).  
Clarrie Long Kemarr.

In the next stages of the project we will continue to expand the data set of sign to include naturally occurring sign conversation and sign narratives. This will contribute to better understandings of the communicative ecology of remote communities, in which sign is an important component. The growing annotated database of Arandic sign will enable detailed comparisons to be made with sign used in other Indigenous communities, beyond the Arandic ones. For example, we will be able to compare the Arandic corpus with Kendon's comprehensive documentation of Warlpiri sign and thus assess more accurately the differences in the sign language lexicon of Arandic languages and of Warlpiri. We anticipate that our methodologies will also provide some structural uniformity in the ways that sign language data is collected, stored and annotated, and, if not, at least a starting point that can be developed and improved upon. The database will also provide a basis for comparisons to be made between these alternate sign languages and primary sign languages, and will contribute to greater understandings of sign language typology, and of linguistic diversity (cf. Evans and Levinson 2009). There are various long-term research questions that may be addressed using the sign

corpus/database. For example, what is the role of gesture in signed discourse? Signers who communicate in primary signed languages, such as Auslan or ASL, use not only fully conventionalized signs: culturally shared or idiosyncratic gestures also occur frequently (Johnston 2011: 31). Comparative studies of how visible bodily action is used in a range of multimodal and ecological circumstances have the potential to contribute to the debate about what is ‘gesture’ and what is ‘sign’ (Kendon 2008). In our work on Arandic sign languages we plan to explore further the role that gesture plays and investigate the types of meanings that are conveyed in this way (cf. Schembri *et al.* 2005). Another question is how pronominal reference is achieved in these alternate sign languages and how this compares with primary sign languages.

Although the first pilot Arandic sign website has been successful, it is still early days. Realistically there is at the current time little capacity for community members to be responsible for the ongoing maintenance of the complex technologies involved in this project, even as their aptitude and enthusiasm for using them grows. Consequently, the project may need to search for ongoing funding or it may need to be concluded in such a way as to not require ongoing technical support. This is by no means a problem unique to online resources. Just as the website needs background support for its continuing maintenance, there needs to be an ongoing process whereby DVDs can be re-issued and distributed if these are to be a sustainable medium for repatriation of linguistic and other cultural material. The annotation of the ELAN database takes technical and linguistic expertise, and so far there has been no engagement of Indigenous people working on the project with these aspects of it. However, as discussed above, there are potentially other entry levels that will serve to introduce people to the exciting potentials of online language resource production. It is never the case that any one person has all the necessary skills and abilities to perform all tasks in a thorough documentation and invariably the tools that linguists perceive to be most appropriate for achieving particular technical ends are not always the most appropriate for the user group. Teamwork, where everyone’s strengths are explicitly acknowledged, is essential.

A sustainable investment in the future of Indigenous cultural material means not only ensuring that data is recorded skillfully, well-documented and appropriately archived, but also that there is effective situation-based learning, participation,

engagement and control at the local level. It means developing ethically grounded collaborative practices, and research aims enabled by local participation. With the affordances of new technologies, however, there remains a fine line between local investment, agency and participation in cultural maintenance activities and the preservation of digital heritage materials at archive standard for posterity. Providing opportunities for people to be involved with different levels of specialist activities is a key to designing appropriate processes for the production of language resources for remote Australian Indigenous communities.

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### Online resources

[<http://iltyemiltyem.tumblr.com/>] (current as of October 2011)