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# Tools for Analyzing Verbal Art in the Field

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Song is a universal human phenomenon that can shed much light on the nature of language. Despite this, field linguists are not always equipped with the knowledge and skills to analyze song texts and draw out their significances to other areas of language. Furthermore, it is not uncommon for a language community to ask linguists working in the field to record and document their songs. Barwick (2012) identifies a number of reasons why linguists should work on songs and identifies iTunes as a local repository for recordings of songs. This paper expands on these reasons and describes how iTunes software can be used for comparing, retrieving and managing recordings of songs. This not only assists analysis of song structure and text, but is also a useful means of providing the community with recordings, even in the absence of a local repository. The paper draws on our use of iTunes during fieldwork on central Australian Aboriginal songs. Our aim is to share the methodology and workflow we use and to encourage linguists to work on this universal, yet often neglected, aspect of language that is often highly valued within the language community.

## 1. INTRODUCTION.[1]

> …the linguist whose field is any kind of language may and must include poetry in his study (Jakobson 1987:93–94).

Language is expressed in various modalities such as speech, sign, poetry, and song. If we are to take seriously the enterprise of documenting a culture's language, we must document all linguistic practices of a language community. This includes the songs and other types of verbal art of a culture, whether they be signed or spoken. Such artistic uses of language are valuable in their own right as an instantiation of language that can reveal the most amazing feats of memory. Songs tend to play a special role in cultures where there is no widely used literacy (Seeger 1987). Here, the performing arts may be the sole means of transmitting important social, cultural and historical information and reproducing the norms of society (Barwick et al. 2005:391). Songs can also shed light on the nature of language, as will be argued here. Despite this, field linguists are not always equipped with the knowledge

[1] We thank the many Central Australian Aboriginal people with whom we have worked over the years. In particular, MK Turner, Agnes Abbott and the Arrernte Women's Songs Project coordinated by Rachel Perkins, where the use of archival recordings for teaching and learning led to furthering the use of iTunes. Funding for this research was provided by the Endangered Languages Documentation Program, the Australian Research Council, Screen Australia, and the University of Queensland.



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and skills to analyze verse and draw out its significances for language. This is even more surprising given how often field linguists find themselves recording songs (a widespread request from language communities), only to wonder what to do with these recordings.[2] Songs have their own structure, different to that of spoken language; and they can be a conundrum for translation.

This paper outlines a methodology for working on songs developed over the course of fieldwork on central Australian Aboriginal songs with Indigenous people. Crucially, it involves the use of iTunes software for comparing, retrieving and managing recordings of songs (Barwick et al. 2005, Barwick 2012). We show how iTunes can be used for playback to discuss the words and meanings of songs with tradition bearers, to facilitate analysis, and help meet community requests to obtain recordings of selected songs. The approach outlined here has been developed with the participation of Indigenous stakeholders which has lead to the development of metadata that facilitates discovery of songs according to culturally relevant categories (cf. Barwick et al. 2005:391); essentially emic categories within the various central Australian Aboriginal societies. Songs in other societies will no doubt be structured quite differently. In field situations where such categories are not yet understood by the researcher, the refinement of the methodology will develop as the researcher's own knowledge of the singing traditions grows. Our aim is not to impose a one-size-fits-all way of working on songs, but to share what we find to be a useful way of doing fieldwork on songs and provide reasons why we have adopted certain practices and not others. We hope that this will encourage field linguists to work on the songs of the language speakers with whom they work.

The outline of this paper is as follows; in the remainder of this section we define our use of the word 'song' for the purposes of this paper; §2 argues why the study of songs is important to linguistics; and §3 describes a methodology for analyzing songs involving linguistic transcription, audio segmentation, elicitation and dissemination of song recordings. §4 concludes the paper by discussing some of the options and issues for academic publication of song recordings.

**1.1 DEFINING SONG.** In comparison to speech, we may say that song is an artistic use of language. In this sense 'song' is part of a broader use of language sometimes referred to as 'oral literature,' 'ethnopoetics,' and 'verbal art' (Woodbury 2003). In this paper we use the term 'song' to cover genres that might be translated in English as 'poetry,' 'verse,' 'chant,' 'ritual speech,' or 'children's rhyming games'. Rather than being discrete categories, many musicologists regard these as points on a continuum as all share a number of features: they occur in specific social contexts, have recurring units and they can often be highly emotive (Barwick 2012:170–171). Not surprisingly, terms for these categories do not always translate well across languages. What is called 'song' in one culture may be quite different to what is called 'song' in another. In many cultures there is a single term that straddles the sung/spoken divide. In the literature we find such genres referred to as 'sung tales' (Rumsey & Niles 2011) and 'song poetry' (Strehlow 1971). In a cross-linguistic comparison of song we should not be surprised to find that the boundaries of 'speech,' 'poetry,' and 'song' differ across cultures, and that such categories may not exist at all. Our use of the term 'song' is broad and meant to include categories of verbal art that may not have a pitch structure and whose rhythm may not be isochronous. While 'song' may well be defined on musical, as

[2]Barwick (2006:54) estimates that many linguistic deposits in archives include a large number of recordings of songs and or music.

well as textual grounds, the focus of this paper is on song texts. Similarly, we may find that verbs such as 'sing' and 'speak' differ in what vocal actions they refer to. For example, in the Arandic languages of central Australia 'sing' applies to the chanted or melodic delivery of poetry and song by people (as opposed to birds), whereas 'speak' is a vocal activity that can be performed by any creature (Green & Turpin 2014).

**1.2 SOME COMMON FEATURES OF SONG.** Although songs may have a written form, in many cultures they are primarily oral, especially songs performed by children. Songs, like other forms of language, may have no written form at all in some cultures. Songs may also have non-linguistic elements, in addition to music (Cross 2007:652). For example, many Aboriginal Australian songs have associated dance and a body design and these are also referred to by the genre name (Barwick 2012:168). One feature that distinguishes song from speech is that the former is made up of lines. Lineation is not a feature of speech—spoken utterances can be of any length and form (Fabb 2009). Lines often have constraints on their length and the types of sounds that can occupy particular positions in the line (e.g., rhyme). Songs also make use of other types of sound patterning, such as parallelism—the repetition of a section across multiple lines. Both these features assist in memorization and transmission of knowledge. This is especially important in preliterate societies where "human memory is the only archive" (Evans 2009:189). Another feature of song is that language can be used for its sound alone, revealing aesthetic preferences of the people who perform them (Seeger 1987).

In some cultures a sung improvised text, made up on the spot, does not constitute a 'song'; only a musical text that can be sung again in subsequent performances is regarded as a song. Songs often adhere to certain design principles, however singers may not be cognizant of these rules, just as most people are not aware of the grammatical rules of their native language. Where songs constitute an open class, that is, where new songs can be composed and added to a genre, then it is possible to test intuitions about the design principles of song by composing a song. In some cultures, however, songs are regarded as having a non-human origin, emanating from spirits or ancestors. In such cases, it may not be possible to get tradition bearer's judgments on whether a made up song is well formed. Performance errors can also reveal the design principles underlying a genre of songs; thus these should be keenly observed. In much of Aboriginal Australia there are specialists within the culture who interpret lyrics, as the differences between sung and spoken language can be great (Strehlow 1955). The right to interpret and sing songs may be dependent on a person's role in society or their relationship to specific songs.

## 2. WHY DOCUMENT SONGS?

> Some forms of verbal art—verse, song or chant—depend crucially on morphological and phonological, even syntactic properties of the language in which it is formed (Hale 1998:204).

There are a number of reasons why linguists should be interested in songs. Songs are an artistic and universal instance of both language and music that is part of the human cognitive capacity for communication (Barwick 2012:167). Furthermore, the debate over the origins of language and music requires an understanding of song (Masataka 2009), as singing is a universal phenomenon but purely instrumental music is not. Given this, it is somewhat surprising that relatively little is known about the nature of song cross-linguistically (Hai

& Bannan 2012:144, 160). This is partly because the structural properties of song are both linguistic and musical. Until we have a clear picture of the singing traditions in a diverse range of cultures our concept of 'song' remains limited and we cannot make headway in the debate over whether people "sang out their feelings long before they were able to speak their thoughts" as put forward by Jespersen (1921:436). It should be apparent too, that we can not answer the question of 'What is music?' until there are descriptions from a broad range of cultures, revealing the full diversity of "humanly organized sound" (Blacking 1973:10).[3]

Songs are often regarded as the "crown jewels" of a community's linguistic achievements and their documentation offers a unique opportunity for the field linguist to build relationships and give back to the community something of great worth (Marett & Barwick 2012:172). Documenting songs is not just documenting language and music, but also cultural practices and knowledge systems, many of which are highly endangered (Feld 1982). In such contexts, the documentation of songs is often a local priority (Barwick et al. 2005:384). From the community perspective, listening to songs can give great pleasure, and recordings may be played over and over again within the community. In some cases, playing these songs is an act of reinforcing the norms or expectations of society; sometimes quite overtly. We have witnessed an amplifier playing traditional songs being turned in the direction of a household whose members were, as we were told, in need of this reinforcement. Working on songs can also be a reward for the "sometimes arid pursuits of grammatical paradigms" (Evans 2009:185). For those involved in the task of transcribing and translating language, the opportunity to work on songs offers significant rewards with its stimulating intellectual content and linguistic artistry.

Songs can also reveal many things about the lexicon. Most cultures have a metalanguage around performance arts. These terms are often based on a polysemy of a concrete concept, and thus may escape the attention of a linguist; for example, a body part term referring to a part of a musical instrument (Feld 1981, 1982, 1983). Songs may also contain other vocabulary and meanings that are rarely encountered in elicitation or in everyday speech, and it may only be in their sung context that they are recognized. For example, emotion terms and words with highly specialized meanings, such as particular dance styles, animal behaviors, types of sounds, as well as past cultural items and practices (Barwick 2006:54, 2012:171). Songs abound in proper nouns and information relating to landmarks and maps (Fabb 2014, Marett & Barwick 2003:146, Feld 1982). Lyrics can be woven from highly elaborate language, with rare and complex words, as songs "do not just come out cold…but are polished and elaborated through numerous retellings" (Evans 2009:185).

Songs can also reveal the basis of metaphors used in everyday speech and their lyrics quoted in conversation as collective shorthand for known places and events (Basso 1996). In Aboriginal Australia there are extensive history myths that are punctuated by songs (Strehlow 1971); and so humming the tune of a song or citing a portion of its lyrics is enough to recall the places, people, and events to which a song relates (Ellis 1985).

Finally, from a grammarian's perspective, songs can shed light on the rules that govern language. For the phonologist, songs are a natural experiment, as they "follow the lines of cleavage given by their phonology" (Evans 2009:186). That is, the prosodic distinctions of a language, such as that between stressed and unstressed syllables, or heavy and light syllables, are often selected to align with the patterns of strong and weak positions of a musical meter (Halle & Keyser 1971, Fabb 1997, Hayes & Kaun 1996). In many Central

[3]This definition of music is intended for the purposes of comparing natural human speech and song; and while it excludes the musical ability found in birds (Taylor 2008), it is beyond the scope of this paper to enter the debate as to whether or not bird song constitutes music.

Australian singing traditions it is the prosodic word that is selected to align with a metrical foot/musical bar (Turpin & Laughren 2013).

Songs may provide evidence of language change, retaining archaic forms for their sound and nuances; and they can expose extensive multilingualism for these same reasons (Koch & Turpin 2008). Songs may also reveal the full semantic potential of the lexicon and throw light on the pathways of semantic change in their abundance of figurative language. In languages that have pragmatically determined word-order, songs may provide evidence for a pragmatically unmarked form. For example, in genres where lines are standalone units, with no relationship to previous or subsequent lines, an absence of discourse marking morphology or variable word order suggests a pragmatically unmarked form (Turpin 2013).

To summarize, song draws upon spoken language—its sounds, grammar, and vocabulary—but it also expands on these in remarkable and creative ways. To what extent song is a development of ordinary language and to what extent it is constrained by musical-poetic requirements remains to be seen, as we are far from a "cross-linguistic synthesis of poetic styles" (Evans 2009:186). We should also keep an open mind as to how song can influence spoken language, as "the impact of artistic creativity does not stop at the work itself, but flows on to the rest of the language system" (Evans 2009:194).

There is a further reason, beyond that of the songs themselves, for field linguists to work on song. In cultures where singing is a group activity, performance of songs can be a spectacular arena of language use. Singers, dancers, and audience may negotiate, praise, criticize, and express expectations, as well as refer to concepts in the domain of song (e.g., pitch, rhythm, text, tempo, timbre), thus providing rich data on both language use and the lexicon. Furthermore, the language in such performances is often more natural than the speech recorded in elicitation settings.

**3. A METHODOLOGY FOR WORKING ON SONGS.** Having decided to work on recordings of songs, the next step is to design a workflow. The workflow proposed in Figure 1 enables quick access to songs for analysis, elicitation in the field, dissemination and publication. Crucially, it involves the use of iTunes for comparison and retrieval of songs, as well as audio editing software to create individual files for each song. The widely available free software iTunes has proven to be useful for working on Aboriginal songs (Barwick et al. 2005, Barwick 2012). One of the advantages of iTunes is that it has a playback function together with the song metadata. Figure 1 is based on current software and formats that are freely available and supported; while formats, software, and devices are constantly evolving, the principles of efficiency (e.g., playback with metadata) and sustainability remain.

Figure 1 assumes that the researcher has already made or obtained an archival copy of a digital recording containing songs.[4] It also assumes the transfer to digital of any analog recordings, a task which is discussed by Barwick et al. (2005:390). From this recording, the workflow shows three main tasks: 1) importing & backing up, 2) linguistic transcription, and 3) excerpting songs as separate files—segmentation. The first two tasks will be familiar to any field linguist and we have little to add here. Instead, we focus on the third task, generating files containing the songs alone. As noted previously, this prepares songs for research in the field, local access, and publication (Barwick et al. 2005, Barwick 2012). While it may not always be appropriate to divide a recording of a musical performance into parts, there are some benefits where this is appropriate. For example, chatter of a personal

[4]See Barwick (2006, 2012:174) for issues to consider when recording singing.

or private nature can be removed before playback within the community; and particular features of the performance for discussion can be retrieved quickly.

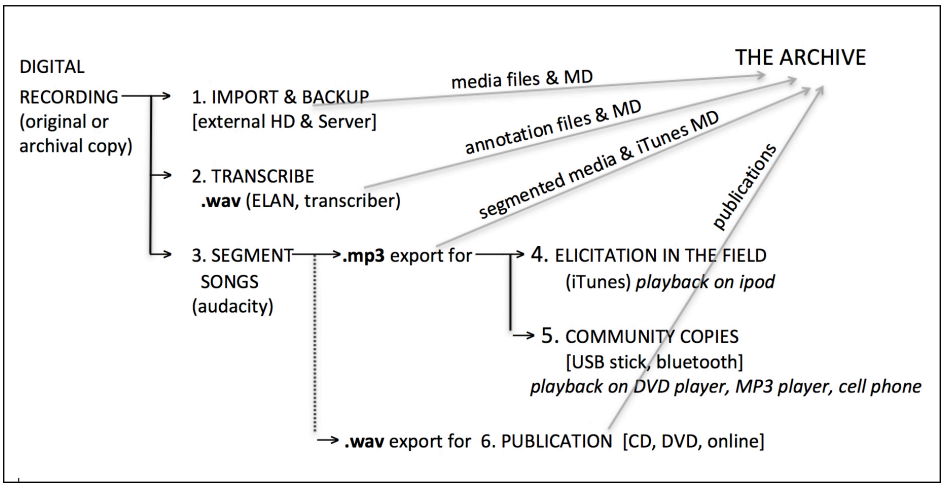



FIGURE 1. Workflow for managing, analyzing and disseminating songs

Each of the three tasks in Figure 1 produces new files, and so archiving is required after each of these tasks. Figure 1 also shows a number of technical things to consider for each task: the software to use, any restrictions on the format of the media (file type), the device or hardware on which the media will be played back, as well as the means of transfer onto that device. The playback devices that are in use in communities can differ greatly, so it is important to know which you will be using before you go into the field. For example, the USB stick is currently a preferred device for audio recordings amongst Aboriginal people in central Australia. These are plugged into portable speakers or DVD players (e.g., Figure 12).[5] Figure 1 also assumes that there is no cell coverage or Internet access in the home, which is the case in many parts of remote Australia (if community members readily access the Internet then other means of transfer are possible).

In the next section we describe each of the tasks numbered 1–5 in Figure 1. These tasks need not be done sequentially and some are best done in tandem, such as transcription (musical and linguistic) and analysis (cf. Barwick et al. 2005:393).

**3.1 PREPARING AUDIO: SOFTWARE, IMPORTING, AND FILE NAMING.** Before starting to work on your recordings, it is a good idea to have the following software downloaded and installed on your computer.

- For transcribing: ELAN and/or Transcriber free software[6]
- For segmenting:
  - Audacity free software (or Sound Studio)[7]

[5]These observations are based on fieldwork undertaken in July 2014 and April 2015. The take-up of various playback devices and the regions in which there is cell coverage in Australia are changing rapidly.

[6]ELAN: https://tla.mpi.nl/tools/tla-tools/elan/; Transcriber: http://transag.sourceforge.net/. Note that Transcriber does not run on Mac System 10.9.4.

[7]Audacity: http://sourceforge.net/projects/audacity/.

  - LAME MP3 codec[8]

- For managing files: iTunes free software[9]

We import the audio from a CD or hard drive by dragging the items into a new folder onto the computer. It is best not to use iTunes at this stage to import the files because it is easy to mistakenly import in a non-ideal format. At this stage we assign appropriate filenames and a hierarchical structure to the media, as shown in Figure 2.[10]

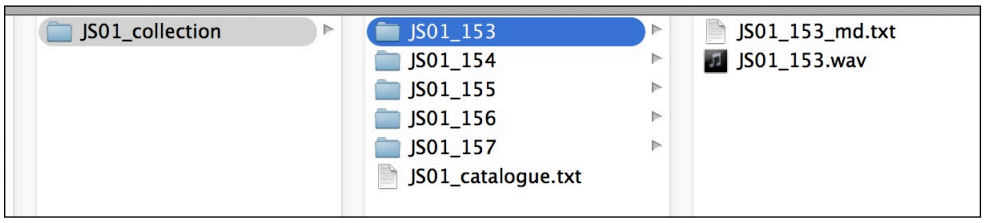



FIGURE 2. An example file hierarchy of John Smith's collection

In Figure 2, each recording session has its own folder (JS01_153, etc.) and inside this folder is the original recording (JS01_153.wav) and metadata, the information about this recording (JS01_153_md). Although not created at this stage, any transcripts and segmented audio files will also go into this folder, as will be discussed below. Before commencing these we back up the imported collections to a hard drive and an external server.

**3.2 LINGUISTICS TRANSCRIPTION.** In this section we discuss software for linguistic transcription, compatible audio formats, and how to label songs and singing in such transcripts. We do not discuss software for musical transcription, such as Sibelius or Finale; however when working with text files we have found the rhythms font useful for standard western musical notation of rhythm. This font can be downloaded from Matthew Hindson's website.[11]

**3.2.1 TRANSCRIPTION SOFTWARE AND AUDIO FORMATS.** Transcription can be done in either ELAN or Transcriber,[12] depending on the aims and context. We have found that language speakers undertaking their own transcription work prefer Transcriber rather than ELAN because it is more intuitive. As these software packages are familiar to linguists we say little about them here. When considering file formats for transcription we use WAV because the waveform does not display correctly in ELAN if it is AIFF. This is also a lossless format and in many cases it is also the format of the original media copied onto the computer (§3.1). Table 1 compares the pros and cons of these audio file formats.

**3.2.2 TRANSCRIBING LYRICS.** It is not uncommon for different people to have different ideas about the lyrics of a song. While this is also a feature of speech, in song this is much

[8]LAME MP3 Codec: http://lame.sourceforge.net/.
[9]iTunes: https://www.apple.com/itunes/.
[10]Screen shot examples given throughout are from a Mac Operating System 10.9.4. Newer versions of OSX may have a slightly different appearance, but the basic functions remain unchanged.
[11]http://www.hindson.com.au/wordpress/free-fonts-available-for-download/.
[12]While ELAN works across platforms, Transcriber only works on Windows and on Apple OS X pre-10.6.

| | WAV | AIFF | MP3 |
|---|---|---|---|
| lossless format | √ | √ | x |
| wave form displays in ELAN | √ | x | x |
| wave form displays in Transcriber | √ | √ | √ |
| metadata transfers to iTunes | x | √ | √ |

TABLE 1. Audio file formats: pros and cons for transcription

more common. Furthermore, in song it may not be the case that one version is wrong and the other is right, in terms of the words intended by the speaker. Ambiguity of the text can be aesthetically pleasing and may be a design feature in some songs. Furthermore, in oral traditions it may be a futile task to even consider the intentions of the original creator, who may be unknown. When it comes to interpretation, even when there is agreement on the words of a song, people may interpret the meaning of lyrics differently. In some cases there may be layers of meanings evoked by a single song; in other cases the choice of words may be deliberately vague to have relevance to many people and across a wide range of contexts, a feature that may increase the popularity of a song. It is highly recommended to keep track of the differing views on the words and meanings of a song, as these may be related to different individuals' experiences and domains of knowledge.

**3.2.3 LABELING SONGS IN A TRANSCRIPTION FILE.** It is a good idea to distinguish speech from singing in linguistic transcriptions. In addition, it can be necessary to distinguish singing (a method of delivery) from songs (a formally recognized song text), which may or may not be sung. The distinction between singing and song is also necessary because what may be sung may not be considered a song. For example, as part of a performance the artist may spontaneously sing parts of a narrative; however these may not be recognized as a song. Songs often have formal requirements pertaining to meter, lineation, sound patterning, or verse structure; and they may have to be previously composed (i.e., not improvised). While such sung speech should be studied in its own right (e.g., When does it occur? What are its structural features? What is its function?), it is important to distinguish singing, as a method of vocal delivery, from a song proper.

At this early stage of linguistic transcription it can be better to avoid labels such as 'song' unless you are clear of what constitutes a song in the culture. For example, in central Australia each song is sung two or three times before moving on to a new song. If we were to label each new unit of singing as song 1, song 2, etc., we would not be counting songs, but some other smaller unit of singing. Researchers in this region use the term 'song item' to refer to these smaller units and the term 'song' is reserved for the larger unit that singers themselves classify as contrastive songs.[13] Another reason to avoid labeling songs uniquely at this early stage is that the starting point of a song may not be fixed (compare how some people may begin a folk song with the chorus while others might start with a verse). Unless the whole text of a song is known, it is easy to misidentify a song as different simply because it is starting at a different point within the song.

[13]The term 'song item' is used frequently in the musicological literature on Australian Aboriginal songs; e.g., Barwick (1989:13, Ellis 1985). Cultures differ as to whether songs can be divided or combined to make up other units, e.g., line, verse, refrain.

Without paying attention to the difference between song items and songs in this tradition it would be easy to mistake two song items as different songs. The process of singing numerous items of the one song is referred to as 'spreading out the song' in some central Australian languages. This is a crucial part of performance that may play a critical role in learning the musical and textual elements of songs (Barwick 2005). A feature of 'spreading out the song' is that subsequent items of the one song tend to commence where the previous item trailed off and hence the starting point of a song is not fixed.

In performances it is always possible to have false starts. These often occur for very interesting reasons. We have observed false starts due to a singer realizing that the subject matter of a song had associations to a deceased person who was very dear to one of the other singers present. We have also observed false starts as a result of needing to vary the order of songs, due to unusually complex rhythms, and wanting to accommodate the vocal range of another singer present. Paying attention to the structural units and organization of a performance and false starts is an important part of understanding what constitutes a song or singing in any culture.[14]

**3.3 SEGMENTATION.** As stated in §3, it is useful to generate excerpts of singing alone to facilitate elicitation in the field, analysis, and to make community copies that can also be prepared for multi-media publications (providing that this is culturally appropriate). In our workflow (Figure 1) this involves exporting the song items from the original audio file into separate audio files. Segmentation can be done before, after, or during transcription.

**3.3.1 AUDIO EDITING SOFTWARE.** Labeling and exporting can be done using Sound Studio, but we prefer Audacity for the following reasons:

**a)** Audacity allows you to enter metadata into the fields 'Title,' 'Artist,' and 'Album' and this information transports into iTunes. (Alternatively you can choose to do this in iTunes using an iTunes script. See §3.4.4).

**b)** Audacity exports each marked up song item into separate files that need no extra cleaning up. (The export in Sound Studio requires you to delete 'leftover' non-song files, which is one extra step.)

**c)** It is simpler to export the time codes in Audacity (by using 'export markers') than in Sound Studio. (In Sound Studio it is necessary to cut and paste and organize this information manually.)

**d)** Sound Studio doesn't create work-in-progress files whereas Audacity does (.aup file extensions), so there is no difference in appearance between a regular audio file and a marked up audio file (unless you open it in Sound Studio). This means that it is easy to accidentally overwrite the marked up audio file with an unmarked version. (A solution to this is to label your marked up Sound Studio files differently, e.g., JS01$_1$53-MU.wav 'Marked Up').

[14] While participant observation is one of the best methods for understanding music, in some contexts this is not appropriate for a number of reasons. In situations of cultural loss, the researcher's involvement can displace younger community members who are striving to learn their songs. Additionally, in some cultures the right to sing a song is highly regulated and so to participate without unprompted invitation would be viewed as brash.

**e)** Audacity is freeware. Having said this, it should be noted that Sound Studio is inexpensive and has a more intuitive user-interface. The pros and cons of the software packages are summarized in Table 2 below.

| | Audacity | SoundStudio |
|---|---|---|
| Metadata transfer (title/name, artist, album) | √ | x |
| Exports files with no extra cleaning up | √ | x |
| Easier to export time codes | √ | x |
| Creates work-in-progress files | √ | x |
| Freeware | √ | x |
| User-friendly, intuitive | x | √ |
| Works across multiple platforms | √ | x |

TABLE 2. Pros and cons of two common audio editing software packages

**3.3.2 LABELING SONG ITEMS.** Here we describe the process we use for labeling songs (or song items) in Audacity.[15] Open the WAV audio file in Audacity and mark the beginning and end of each stretch of singing using the function Add Label (or Add marker if using Sound Studio).[16] The name given to each label will become the filename, once exported (Figure 3). In order to track the relation of each excerpt file to the original recording it is best to label song items sequentially (Barwick et al. 2005:393). We copy and paste the first part of the filename (e.g., JS_01-153-) into each song item and then manually type: 01, 02, etc. Note that the copy and paste functions will only work in Audacity if the audio is paused.

**3.3.3 EXPORTING SONG ITEMS.** After identifying and labeling all song items, to split a copy of the audio into individual files, select Export Multiple from the File menu (Figure 4). Here you can choose the file format. We use MP3 rather than WAV when exporting individual items because metadata is only transferred into iTunes in MP3 format. Additionally, MP3 audio has a smaller file size (the iTunes database quickly gets very big and playback devices are often short of room). When choosing options for export, check the 'Using Label/Track Name' circle to ensure the files are named as per the labels in the Audacity file (e.g., JS01_153-01). For the export location, we create a separate folder within the session for the exported song items. Select Export. You must have LAME MP3 CODEC downloaded and installed on your computer to be able to export audio as MP3 (§3.1). A message appears asking you to locate this file or download it if it is not installed on your computer.

Audacity also allows you to enter metadata at this stage for each item and save this as a template (Figure 5). Use either Set Default or Save. Audacity assigns a track number but this doesn't show in the name of the exported file, or in the copy that is imported into

[15] We have tried to export the time codes of song items from the transcription file (ELAN, Transcriber) into Audacity or Sound Studio; however we have not had success with this. It may be possible to export the time codes into the audio editing software if the original transcription were done in Praat; however we assume that most field linguists use ELAN for transcription, especially if they use video.

[16] Useful Mac keyboard shortcuts in Audacity: (cmd+B) Add Label; drag >< buttons on the marker to Adjust Selection Boundary; (cmd+1) Zoom In Waveform, (cmd+3) Zoom Out Waveform.

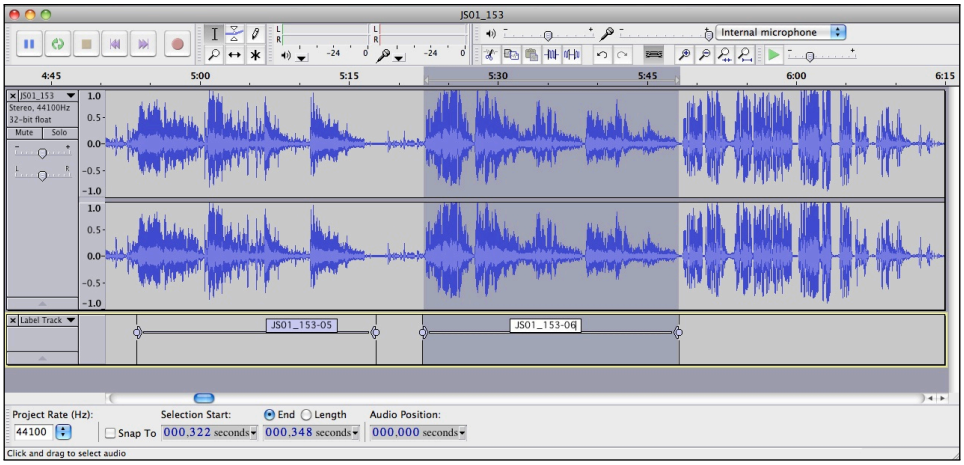



FIGURE 3. Labeling song items in Audacity

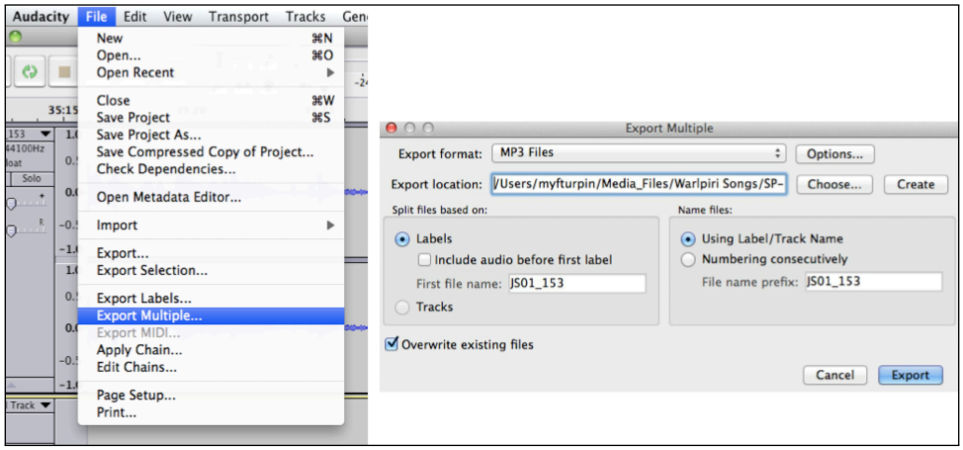



FIGURE 4. Exporting multiple items as MP3 audio files

iTunes. At this stage you need to click the OK button for each label you want exported. For example, if your file has 90 song items you will need to press the OK button 90 times (alternatively you can hold the Return key down until the 90 songs have been exported).

Once the export is complete it is a good idea to export the time codes of each song item by selecting 'Export Labels' from the File menu of Audacity. This creates a text file of the start and end point of each label (the song items) in the original audio file. This can also be done in Sound Studio, although it requires a few extra steps (Open Markers window, Select all, Copy, and then Open and Paste into a new text file). It is important to keep track of the time codes of the excerpted songs so that the individual song files can be linked back to the original recording. It is also then a simple matter to export particular song items again in a higher quality form (e.g., WAV), for example for CD publication.

The Session folder, ready for backup and archiving again, will now have associated transcripts (JS01_153.eaf, JS01_153.trs)[17] and a folder of song items with a text file of time

[17]These are sometimes referred to as annotation files.

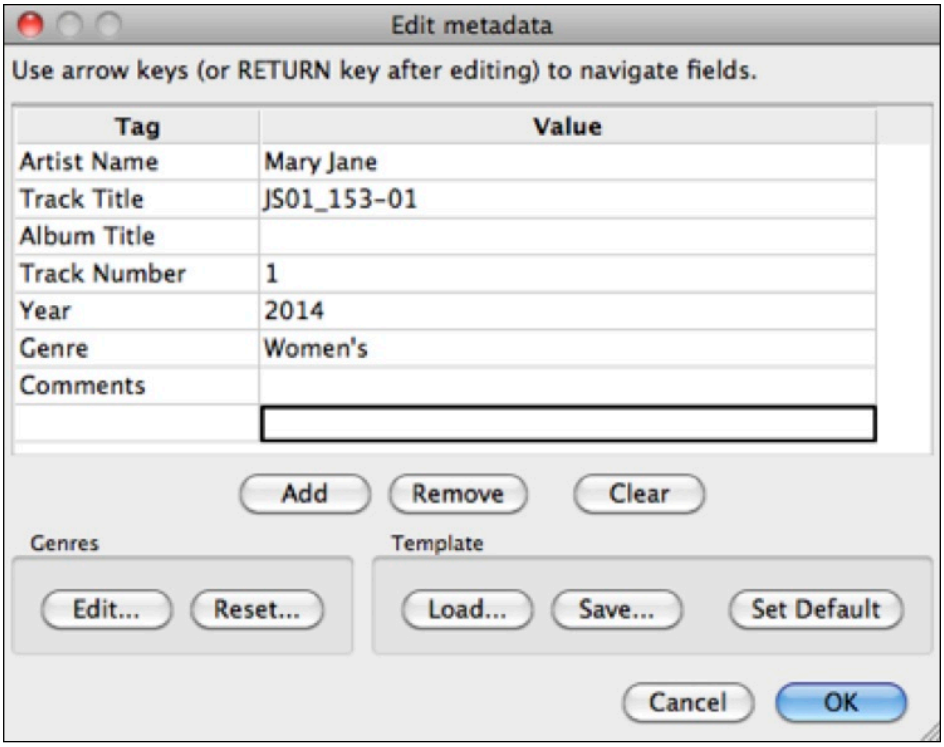



FIGURE 5. Assigning metadata to song items in Audacity

codes (Figure 6). Audacity also creates its own folder of data files (JS01_153-audacity), as discussed in §3.3.1.

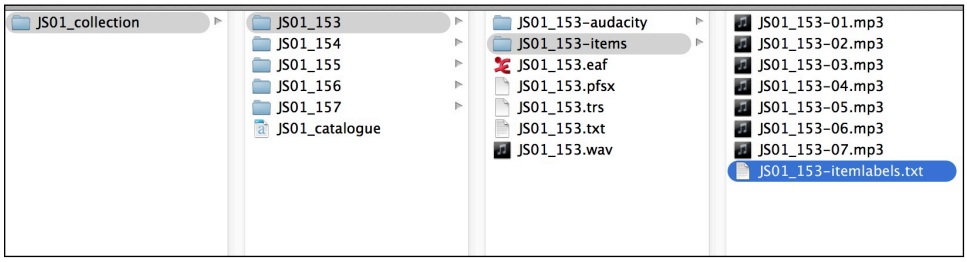



FIGURE 6. File hierarchy of the recording JS_153 transcribed and segmented into song items

**3.4 USING iTUNES FOR MANAGING AND ANALYZING SONG.**[18] During playback, information provided by tradition bearers can be entered directly into the iTunes database of the song being played as fieldwork takes place (Barwick et al. 2005: 393). The metadata fields in the iTunes database can also be tailored to suit your own needs, enabling searching and sorting similar to an Excel database. It also allows the creation of playlists to organize songs, which is useful for elicitation and for returning copies of selected audio to community members.

[18]This discussion of iTunes is based on Version 11.1.5 (5).

Further benefits of iTunes are that it has a user-friendly interface, it works across platforms and on many devices, and is unlikely to become obsolete in the near future.

**3.4.1 IMPORTING THE SEGMENTED SONGS INTO iTUNES.** You can import the folder of song items from the session into iTunes in one of two ways. Within iTunes, you can do this by selecting 'File > Add to Library' and navigating to the location of the Song items folder. Alternatively you can copy and paste (or drag and drop) the song items into 'iTunes Media > Automatically Add to iTunes.' These songs appear in iTunes next time you open it. The folder 'Automatically Add to iTunes' can be put anywhere on your computer and so we keep it under Favorites (Figure 7).

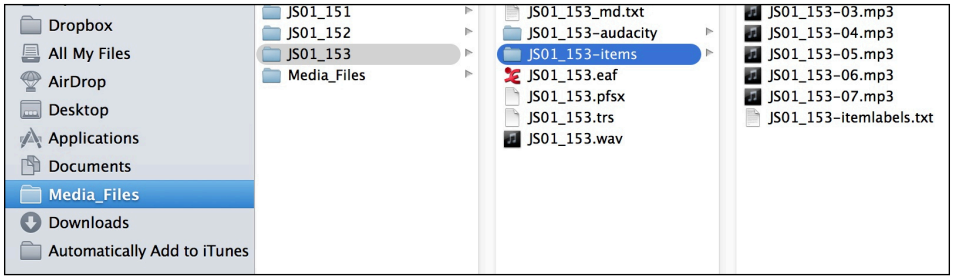



FIGURE 7. Importing songs using Automatically Add to iTunes

Note that iTunes adds another copy of a song should you happen to import a file with the same name more than once. This means that you cannot replace a file in iTunes with an updated one; you need to manually delete the previous version.[19]

**3.4.2 USING iTUNES METADATA FIELDS.** The iTunes metadata fields can be used for different types of information. However, when choosing fields to suit your own purposes, be aware that the only fields that display on the screen of many older iPods are: Name, Album, and Artist (Figure 8).[20]

We use the 'Name' field for the original media file plus a sequential number for each song item on this media file (-01, -02 etc.) and the 'Album' field for the song (since each item is not necessarily a unique song). We use the 'Album Artist' for the sung text, with vertical lines ( | ) to represent line boundaries and apostrophes ( ' ) to indicate where a breath is taken. We use the 'Artist' field for the performers, 'Composer' for the language associated with the song, and 'Comments' for additional information about the song item. These iTunes fields are shown in Figure 9.

The level of granularity in our iTunes database is thus the song item. All song items are an instance of a song, which is a member of a repertory, which is a member of a genre. The hierarchical classification of units in the domain of song can be represented as [genre > repertory > song > song item]. Songs are named using a unique identifier that also encodes the genre and repertory to which the song belongs. In Figure 9, the 'w-' prefix is a

[19] There are various iTunes scripts (§3.4.4) that will locate multiple files of the same name, e.g., 'Wrangle Same-Named Tracks': http://dougscripts.com/244.

[20] Newer iPods display Album Artist (which we use for song text), however this text runs across the screen, which is not very convenient in the field.

[21] Figure 8 shows a fifth generation iPod.


FIGURE 8. An iPod display for a song elicitation session[21]

| Name | Album | Album Artist | Composer | Artist | Comments |
|---|---|---|---|---|---|
| Arnka070404_10-28 | w-ntarr10 | karnkilyarn kilyila ' lekwalpa kwetyay \| ' karntithal petha... | Alyawarr | Kiji Kemarr,... | Crying in background |
| Arnka070404_10-29 | w-ntarr10 | karnkilyarn kilyila ' lekwalpa kwetyay \| ' karntithal petha... | Alyawarr | Kiji Kemarr,... | note tense ending |
| Aus355-item01 | w-ntarr10 | karnkilyarn kilyila ' lekwalpa kwetyay \| ' karntithal petha... | Alyawarr | Polly Pwerl,... | |
| Aus355-item02 | w-ntarr10 | karnkilyarn kilyila ' lekwalpa kwetyay \| ' karntithal petha... | Alyawarr | Polly Pwerl,... | |
| Aus357_item23 | w-ntarr10 | karnkilyarn kilyila ' lekwalpa kwetyay \| ' karntithal petha... | Alyawarr | Polly Pwerl,... | |
| Aus357_item24 | w-ntarr10 | karnkilyarn kilyila ' lekwalpa kwetyay \| ' karntithal petha... | Alyawarr | Polly Pwerl,... | |
| JG019584-item16 | w-ntarr09 | kakurrpa rerla ' lernawa tyerni \| kaharrki lema yalharna | Alyawarr | Kiji Kemarr,... | |
| JG019584-item19 | w-ntarr09 | kakurrpa rerla ' lernawa tyerni \| kaharrki lema yalharna | Alyawarr | Kiji Kemarr,... | |
| Arnka040911_05-19 | w-ntarr09 | kakurrpa rerla ' lernawa tyerni \| kaharrki lema yalharna | Alyawarr | Kiji Kemarr,... | |
| Arnka040911_05-20 | w-ntarr09 | kakurrpa rerla ' lernawa tyerni \| kaharrki lema yalharna | Alyawarr | Kiji Kemarr,... | |
| Arnka070404_10-26 | w-ntarr09 | kakurrpa rerla ' lernawa tyerni \| kaharrki lema yalharna | Alyawarr | Kiji Kemarr,... | |
| Arnka070404_10-27 | w-ntarr09 | kakurrpa rerla ' lernawa tyerni \| kaharrki lema yalharna | Alyawarr | Kiji Kemarr,... | |

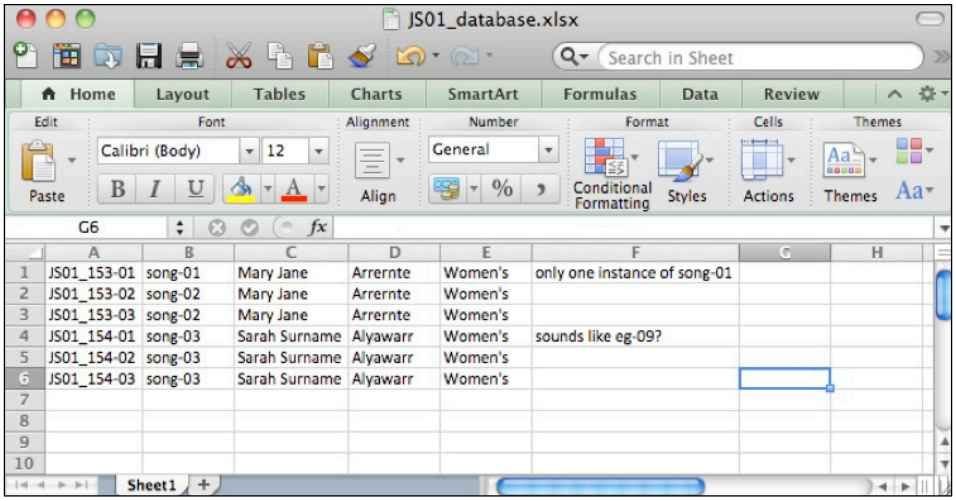
FIGURE 9. Example of iTunes metadata fields used for linguistic fieldwork on songs

genre abbreviation and the five letters following are a repertory abbreviation; the two-digit numbers are unique within this identifier.

Sorting iTunes by song (for which we use the Album field) is very useful for comparing multiple renditions of a single song (i.e., multiple items of the one song). For example, to compare the text of multiple items of a song across performances, to count the number of songs in a repertory, or to discern the number of items of each song. Such comparisons often reveal variation that does not constitute a different song but simply performance variation. For example, in many Arandic songs, items of one song may begin with '*-k*' or with '*-m*'. These two different consonants correspond to different tense marking on the verb: past and non-past respectively; yet tradition-bearers regard these as variants of the one song. We

can interpret this 'free variation' as a result of the tense marker no longer performing a communicative function in the songs. Instead these consonants are used for their sound rather than their meaning (Turpin 2013, Turpin & Ross 2013).

**3.4.3 COPYING AND BACKING UP iTUNES METADATA FIELDS.** The iTunes metadata can be exported as a catalog by selecting all the songs (cmd+A) and copying and pasting into a blank Excel spreadsheet (Figure 10). We have found this useful for making CD covers in the field (Figure 11) and providing people and organizations with sheets of metadata for specific song repertories or singers. It is also important to back up the metadata in a spreadsheet regularly in the event of an iTunes database malfunction.




| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | JS01_153-01 | song-01 | Mary Jane | Arrernte | Women's | only one instance of song-01 | | |
| 2 | JS01_153-02 | song-02 | Mary Jane | Arrernte | Women's | | | |
| 3 | JS01_153-03 | song-02 | Mary Jane | Arrernte | Women's | | | |
| 4 | JS01_154-01 | song-03 | Sarah Surname | Alyawarr | Women's | sounds like eg-09? | | |
| 5 | JS01_154-02 | song-03 | Sarah Surname | Alyawarr | Women's | | | |
| 6 | JS01_154-03 | song-03 | Sarah Surname | Alyawarr | Women's | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |

FIGURE 10. Metadata pasted into Excel from iTunes

**3.4.4 PREPARING A PLAYLIST FOR ELICITATION.** Make sure you test the playlist prepared for elicitation on the iPod before heading into the field to make sure all songs play correctly. If the audio in iTunes is sampled at an unusual rate (e.g., 32/48khz) then a conversion to MP3 will correct this, whereas a conversion to WAV or AIFF will not.

It may be necessary to edit the existing metadata of many fields in iTunes at once. If you want to overwrite the information, simply select the necessary items and 'Get Info' (cmd+I), and fill in the field. However, sometimes more complex renaming is needed, for example to change the numerical sequence of items or append information to a filename. In these cases we recommend the use of iTunes scripts. They are freely downloadable[22] and can be used to automate what would otherwise be a repetitive and time-consuming task. There are hundreds of these scripts available for all kinds of functions. For example, the 'Search-Replace Tag Text' script can be used to automatically replace all instances of an artist's name across the entire music library if you need to change the spelling. For similar renaming functions in Finder, the Name Changer software is also useful.[23]

[22] http://dougscripts.com/itunes/
[23] http://mrrsoftware.com/namechanger/

**3.5 ELICITATION.** In the iTunes database it is a good idea to create a playlist of the songs you wish to elicit from in the field. These playlists can then be loaded onto an iPod or other portable music player.[24] We use an iPod rather than an iPhone because it has longer battery life and more room; however, note Apple's recent announcement that it will no longer support the iPod.[25] We connect the iPod to high quality portable speakers via a 1/8-inch cable rather than via Bluetooth or iPod dock speakers.[26] We find the cable is most robust, and unlike an iPod dock, it enables the researcher to control the iPod while the speakers can be placed near other people.

When selecting exemplars of songs for elicitation it is a good idea to exclude ones with talking or any other sorts of noise that could distract participants from the task of identifying and translating the song. We select only one or two song items of each song, as in some performances a song may be 'spread out' many times.[27] As stated in §3.3, it is a good idea to adhere to the order of songs as per a particular performance. In this way it is possible to uncover whether there are different meanings of a song performed at different stages in a performance, or when it follows a different song. For those song items whose text is difficult to discern, it can be a good idea to play these after the easier ones have been played.

When working with archival recordings it is a good idea to provide the community members with as much information about the context of the recordings as possible before working on the recording. Ideally it is best to find someone in the community who was present or remembers when the recording was made and involve them in the elicitation session. However some things cannot be planned for. There was one set of archival recordings that, when played back to tradition-bearers, was regarded as being performed at an incorrect tempo, much too fast.[28] While this situation led to some insightful discussions about tempo, it was not possible to focus on the lyrics of these songs and so the task had to be abandoned.

A song can sound very different when it is sung to when it is spoken, in such cases it is useful to ask tradition-bearers to say the lyrics. Note, however, that this can be a difficult task if the lyrics are not in a language spoken by the singer or if they contain vocables (Marett et al. 2013). There may also be many ways of rendering a song text into speech. Sometimes the spoken version equates word-for-word with the sung version, but other times one or more syllables may be left out, added, or the entire song is paraphrased. Such spoken versions of the text are of interest for a number of reasons. Where do the extra syllables occur? Does this same omission occur in more than one song? Often an omitted syllable in the spoken version is a vocable, meaning that it has no lexical function but is there to meet the syllabic requirements of the line. Vocables tend to be inserted regularly, for example at the end or beginning of a line. Conversely, text in the spoken version that is absent in the sung version may be due to limitations on line length. For example, in some central Australian repertories the semantic case of a complex noun phrase is omitted in the song.

[24] One drawback of iPods and mobile phones is that the battery cannot be taken out and replaced.

[25] his decision comes much to the disappointment of many music enthusiasts http://www.sbs.com.au/news/article/2014/09/15/comment-farewell-ipod.

[26] We currently use the Bose SoundLink Mini Bluetooth speaker: http://worldwide.bose.com/axa/en_au/web/soundlink_mini/page.html?src=OMDAUSRCH.

[27] This would not be appropriate for other aims. For example, one could not understand the structure of song items in a Central Australian performance by singling out song items in this way.

[28] The ethnomusicologist who made the recordings believes these to be at the tempo as performed. One possible explanation is that the singers, who were involved in the recordings some 40 years previously, have not noticed a gradual decline in tempo of their performances over the years.

It is not uncommon for different custodians to give different spoken versions of a song. Some may include the vocables; others may give only the lexical content, while yet others may paraphrase the meaning of the song, so that there is very little formal resemblance to the sung text. A paraphrase of a song is useful to understand the broader meanings and significances of the song. It is not uncommon for songs to be highly elliptical and so a broader exegesis of the song is necessary to determine what they are about. In group singing, consonants in particular may be hard to differentiate, making it difficult to identify words. If it is not possible to elicit a spoken version of the lyrics, one way to check the phonemes of the song text (as opposed to its meaning) is to say or sing the song text back to the consultant during elicitation, as it is possible that s/he will correct you, hopefully enabling you to confirm the underlying phonemes of the song.

**3.6 COMMUNITY COPIES.** We have found that community members often ask for particular collections of songs, such as all the songs sung by person X, or all the songs of repertory X. In iTunes, a smart playlist enables you to create such collections without physically having to move the required songs into that playlist. Furthermore, a smart playlist keeps up with the latest songs entered into the iTunes database. It is then a simple matter to burn a CD (iTunes playlist > burn to CD) or copy the smart playlist onto a hard drive or USB stick. Note that iTunes automatically renames the files in a copied playlist to include a track number at the front, e.g. 01 JS01$_1$53-05. It is a good idea to delete the track number prefix from the copied files so that the community copies are named identically as per the database.

It is easy to make a CD sleeve of the tracks with their song texts by cutting and pasting the metadata from iTunes into a CD or DVD sleeve template (Figure 11).

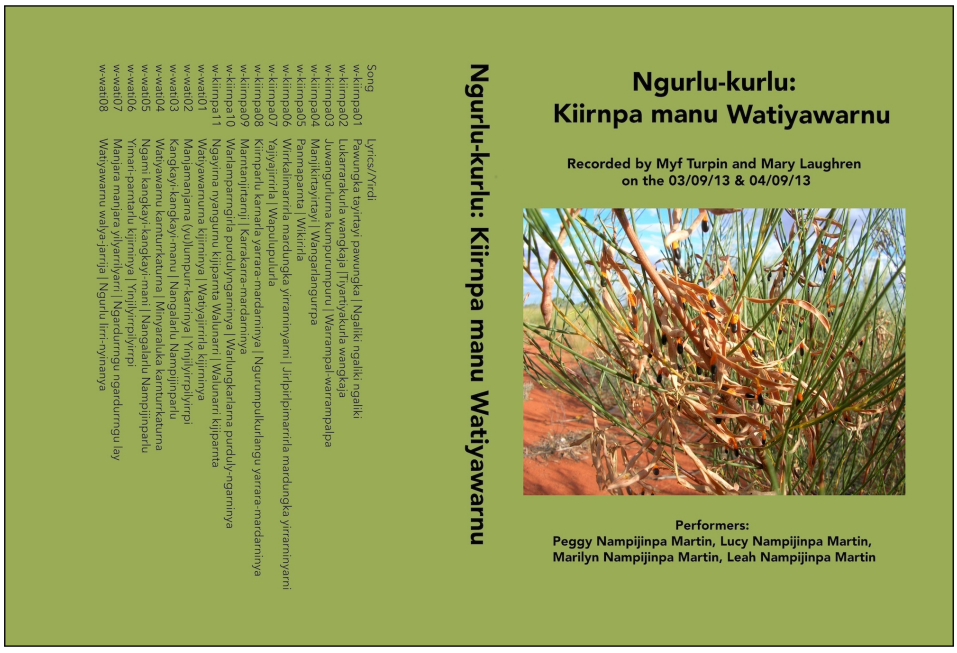



FIGURE 11. DVD sleeve with tracks and text exported from iTunes in the field

In central Australia we find that community members now have devices that play USB sticks rather than CDs, such as that in Figure 12, so we have also considered printing and

laminating this information and attaching it to a USB stick.[29] It is also relatively inexpensive to buy USB sticks in bulk and have an institution name or logo printed on them.[30]


FIGURE 12. A favorite playback device in central Australian communities: an outdoor MP3 player/speakers with USB and Micro SD input

**4. PUBLICATION OF SONGS.** Published analyses of songs are of much greater value to the research community when the audio data on which they are based can be accessed. Furthermore, by including audio, academic publications are also useful to the language community. For academic publishing of songs there are now a number of options for including media with the analysis of songs:

1. publishing audio CD/DVDs with detailed sleeve notes
2. uploading audio files to a website to accompany a publication
3. embedding audio/video into a digital PDF publication (e.g., Adobe Acrobat)

[29]Laminators are widely used throughout schools in central Australia.
[30]In Australia, this works out to be $AUS6 per USB.

4. embedding audio into a hardcopy publication through Soundprinting[31] (e.g., Turpin & Ross 2013, Curran & Napanangka 2014)

A discussion of the pros and cons of these various options is beyond the scope of this paper. The choice will depend to a large extent on the particular publisher involved (see Barwick 2012:178–9). Note that the third option, which is only available in a digital form, is the cheapest.

No matter which format is chosen, it is crucial to obtain permissions from all copyright holders of the songs to reproduce songs in any publication. Researchers have a responsibility "to acknowledge the moral and legal rights of musicians and performers under traditional and international law," which Barwick (2012:172) notes defines music, songs, dance, and poetry as 'works.' Many publishers will require evidence that copyright holders have consented to the reproduction of their songs. Many countries have creative arts laws that aim to protect singers and other artists;[32] however these laws may not reflect the local system of song ownership, which may or may not be formalized. Thus, it may be necessary to obtain agreements from within two different legal frameworks: the national system and the system that exists within the language community with whom one works.

The rapidly changing face of the music industry with its implications for playback and distribution brings exciting possibilities for accessing songs, yet poses challenges for controlling the use of recordings. While such changes cannot always be anticipated, the methodology for working on songs outlined here remains a practical tool for working with recordings of songs in the field. We encourage linguists to examine the songs of the language community with whom they work, which can bring great personal rewards and enrich our understanding of the diversity of language and music.

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[31] http://www.printingasia.com/sound_printing.html

[32] Despite this, there are instances of laws being broken and communities not having the power or money to afford legal action to assert their right. See Feld (2000) for a discussion of a particularly well-known example.

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