

EASY CONSTRUCTION OF MULTIMEDIA ONLINE LANGUAGE TEXTBOOKS AND LINGUISTICS PAPERS WITH LARA

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Abstract

LARA is a collaborative open project whose goal is to create resources that help people read L2 texts in foreign/archaic languages. It does this by providing tools that make it easy to transform plain text documents into hypertext versions that give non-native readers various kinds of help. Here, we describe recent work in which we have extended LARA in a new direction. Although the platform was originally constructed with pure L2 texts in mind, we have found that it is easy to adapt it so that it can also be used for linguistics papers and language textbooks; these are typically a mixture of L2 and L1 text, with examples in L2 and explanations in L1. Our presentation is organised around two paradigmatic examples, both developed within the framework of Ghil'ad Zuckermann's "Revivalistics" program. The first is a LARA version of *Barngarlidhi Manoo* ("Speaking Barngarla Together"), a 70 page primer for the South Australian Aboriginal language Barngarla composed by Zuckermann with the Barngarla people; the second is a section from Zuckermann's 2020 book *Revivalistics: From the Genesis of Israeli to Language Reclamation in Australia and Beyond* (New York: Oxford University Press). Both examples are available online.

Keywords: CALL, reading, multimedia, open source, textbooks, indigenous languages.

1 INTRODUCTION

LARA (Learning and Reading Assistant; <https://www.unige.ch/callector/lara/>) is a collaborative open project, initiated in Q3 2018, whose goal is to create resources that help people read L2 texts in foreign/archaic languages. It does this by providing tools that make it easy to transform plain text documents into hypertext versions that give non-native readers various kinds of help; the type most relevant to this paper is the ability to attach audio to words and sentences. Here, we describe recent work in which we have extended LARA in a new direction. Although the platform was originally constructed with pure L2 texts in mind, we have found that it is easy to adapt it so that it can also be used for linguistics papers and language textbooks, which are typically a mixture of L2 and L1 text with examples in L2 and explanations in L1. The specific examples we present have both been developed in the context of Ghil'ad Zuckerman's "Revivalistics" program, but the methods described carry over easily to other kinds of texts.

The rest of the paper is organized as follows. We start in §2 by giving a brief overview of LARA, and then in §3 describe how we extended the functionality to be able to handle the mixed L1/L2 texts used here. §4 gives an overview of the Revivalistics program. §5 and §6 describe two paradigmatic examples. The first is a LARA version of *Barngarlidhi Manoo* ("Speaking Barngarla Together"), a 70 page primer for the South Australian Aboriginal language Barngarla composed by Ghil'ad Zuckermann with the Barngarla people; the second is an extract from a forthcoming linguistics book by Zuckermann. The final section concludes.

2 THE LARA PLATFORM

The simplest way to give an idea of what LARA does is to show an example. Figure 1 presents a screenshot of the LARA version of Lewis Carroll's *Alice in Wonderland*. The full text of the book, including the Tenniel illustrations, is available online, divided up into pages. The reader can click on any word and immediately see other places where it occurs in the text. Here, they have clicked on "open" ("at any rate, it would not open any of them"). The right-hand side of the screen displays ten occurrences of "open"; note that there are several different inflected forms ("opened", "opening").

The reader can hover the mouse over any word and hear a piece of recorded audio with a native speaker reading the word; they can also click on any of the loudspeaker icons and hear a recording of the whole of the preceding segment of text. Audio is recorded using an efficient online tool, shown in

Figure 2. The content creator divides the text into segments, and a recording task like the one displayed is automatically created. The voice talent can click on the button opposite any phrase, record it, and listen to what they have produced; they may rerecord as many times as they wish, record the items in any order, or leave the task and return to it later.

Figure 1. Online LARA version of “Alice in Wonderland”. A link is given on the LARA examples page, <https://www.unige.ch/collector/lara-content/>

Figure 2. Using the online audio recording tool to record content for “Alice”.

All the functionality is available through an online portal, described in another paper presented at this conference [1]. This helps the content constructor mark up the text into the form required by LARA (an example is shown in Figure 3), record audio, add translations, etc. More information about LARA can be found in our recent overview paper [2] and the online documentation [3].

3 EXTENDING LARA TO HANDLE TEXTBOOKS AND LINGUISTICS PAPERS

As noted, LARA was originally designed to support the reading of non-native (L2) texts. There are many texts, however, that are not pure L2, but can benefit just as much from the kind of help LARA is able to provide. These texts mix L2 and L1 text, typically with L1 text explaining L2 text, or L2 text providing examples of issues described in L1 text, or some combination. The most obvious examples are linguistics articles and language primers.

As interest was expressed for this functionality, we developed the necessary extensions. Markup notation was introduced to distinguish between L1 and L2 text. Depending on the nature of the text, there is the option to make either the L1 or the L2 the default: the content creator chooses which to mark up. We consequently support two forms of the notation. If L1 is the default, we enclose L2 text in double braces, {{ ... }}. If L2 is the default, we enclose L1 text in “comment-brackets”, /* */.

```

■ <page>There were#be# doors#door# all round the hall, but they were#be# all locked#lock#;|| and when
Alice had#have# been#be# all the way down one side and up the other, trying#try# every
door, she walked#walk# sadly down the middle, wondering#wonder# how she was#be# ever to
get out again.||

Suddenly she came#come# upon a little three-legged table, all made#make# of solid
glass;|| there was#be# nothing on it except a tiny golden key, and Alice|'s
first thought#think# was#be# that it might belong to one of the doors#door# of the hall;||
but, alas! either the locks#lock# were#be# too large, or the key was#be# too small,
but at any rate it would not open any of them.|| However, on the second
time round, she came#come# upon a low curtain she had#have# not noticed#notice# before, and
behind it was#be# a little door about fifteen inches#inch# high;|| she tried#try# the
little golden key in the lock, and to her great delight it fitted#fit#!||

```

Figure 3. Marked-up LARA source text for “Alice”. Segment breaks are marked using a double vertical bar (||), page breaks using the <page> tag, and uninflected forms of words using hashtags (were#be#). Default markup is added automatically by the LARA platform; the context constructor can then adjust it as they wish.

To support the more complex layout requirements of this sort of text, standard HTML options (italics, bold font, headings, tabular layout, page-dependent CSS stylesheets etc) have been made available and include the possibility of automatically generating tables of contents and bookmarks.

Examples of all this functionality can be found in the two paradigmatic examples presented later in §5 and §6. Basic statistics for the examples are given in Table 1 immediately below. Links to online LARA versions can be found on the LARA examples page, <https://www.unige.ch/collector/lara-content/>.

Table 1. Texts used for examples.

	#Pages	#Words	#Audio files
Extract from <i>Revivalistics</i> (§5)	4	1674	113
<i>Barngarlidhi Manoo</i> (§6)	67	2568	339

4 A BRIEF OVERVIEW OF REVIVALISTICS

Revivalistics is a new trans-disciplinary field of enquiry studying comparatively and systematically the *universal* constraints and global mechanisms on the one hand [4,5,6] and *particularistic* peculiarities and cultural relativist idiosyncrasies on the other, apparent in linguistic reclamation, revitalization and reinvigoration across various sociological backgrounds, all over the globe [7,8].

What is the difference between reclamation, revitalization, and reinvigoration? All of them are on the revival spectrum. Specific definitions used here:

- *Reclamation* is the revival of a ‘Sleeping Beauty’ tongue, i.e. a no-longer natively spoken language, as in the case of Hebrew, Barngarla (the Aboriginal language of Eyre Peninsula, South Australia), Kurna (the Aboriginal language of Adelaide, Australia), Wampanoag, Siraya and Myaamia.
- *Revitalization* is the revival of a severely endangered language, for example Adnyamathanha of the Flinders Ranges in Australia, as well as Karuk and Walmajarri.
- *Reinvigoration* is the revival of an endangered language that still has a high percentage of children speaking it, for example the Celtic languages Welsh and Irish, and the Romance languages Catalan and Quebecoise French.

Revivalistics is trans-disciplinary because it studies language revival from many angles ranging from health to law to culture and technology (see [9]). Consider the example of architecture. An architect involved in revivalistics might ask the following ‘location, location, location’ question, which is, of course, beyond language:

- Should we reclaim an Indigenous language in a natural Indigenous setting, to replicate the original ambience of heritage, culture, laws, and lores?
- Should we reclaim an Indigenous language in a modern building that has Indigenous characteristics such as Aboriginal colours and shapes?
- Should we reclaim an Aboriginal language in a western governmental building – to give an empowering signal that the tribe has full support of contemporary mainstream society?

Why should we invest time and money in reclaiming ‘Sleeping Beauty’ languages?

The following are the main reasons for language revival.

Ethical reasons

According to the international law of human rights, persons belonging to ethnic, religious, or linguistic minorities have the right to use their own language (Article 27 of the ICCPR). Thus, every person has the right to express themselves in the language of their ancestors, not just in the language of convenience that English has become.

Through supporting language revival, we can appreciate the significance of Indigenous languages and recognise their importance to Indigenous people and to Australia. We can then right some small part of the wrong against the original inhabitants of this country and support the wishes of their ancestors with the help of linguistic knowledge.

Aesthetic reasons

The linguist Ken Hale, who worked with many endangered languages and saw the effect of loss of language, compared losing language to bombing the Louvre: ‘When you lose a language, you lose a culture, intellectual wealth, a work of art. It’s like dropping a bomb on a museum, the Louvre’ (*The Economist*, 3 November 2001). A museum is a repository of human artistic culture. Languages are at least equally important since they store the cultural practices and beliefs of an entire people. Different languages have different ways of expressing ideas and this can indicate which concepts are important to a certain culture.

For example, in Australia, information relating to food sources, surviving in nature, and Dreaming/history is being lost along with the loss of Aboriginal languages. A study by Boroditsky and Gaby [10] found that speakers of Kuuk Thaayorre, a language spoken in Pormpuraaw on the west coast of Cape York, do not use ‘left’ or ‘right’, but always use cardinal directions (i.e. north, south, east, west). They claim that Kuuk Thaayorre speakers are constantly aware of where they are situated and that this use of directions also affects their awareness of time [10]. Language supports different ways of ‘being in the world’.

Utilitarian benefits

Language revival benefits the speakers involved through improvement of wellbeing, cognitive abilities, and mental health (see [8]); language revival also reduces delinquency and increases cultural tourism. Language revival has a positive effect on the mental and physical wellbeing of people involved in such projects. Participants develop a better appreciation of and sense of connection with their cultural heritage. Learning the language of their ancestors can be an emotional experience and can provide people with a strong sense of pride and identity.

There are also cognitive advantages to bilingualism and multilingualism. Several studies have found that bilingual children have better non-linguistic cognitive abilities compared with monolingual children [11] and improved attention and auditory processing ([12]: 7879): the bilingual’s ‘enhanced experience with sound results in an auditory system that is highly efficient, flexible and focused in its automatic sound processing, especially in challenging or novel listening conditions’.

Furthermore, the effects of multilingualism extend to those who have learned another language in later life and can be found across the whole lifespan. This is relevant to the first generation of revivalists, who might themselves be monolingual (as they won’t become native speakers of the Revival Language). The effects of non-native multilingualism include better cognitive performance in old age [13], a significantly later onset of dementia [14], and a better cognitive outcome after stroke [15]. Moreover, a measurable improvement in attention has been documented in participants aged from 18 to 78 years after just one week of an intensive language course [16]. Language learning and active multilingualism are increasingly seen as contributing not only to psychological wellbeing but also to

brain health [17], with a potential of reducing money spent on medical care [16].

Therefore, language revival is not only empowering culturally, but also cognitively, and not only the possibly-envisioned native speakers of the future but also the learning revivalists of the present.

An example in practice

The reclamation of Barngarla began in 2012 after Zuckermann had contacted the Barngarla community in 2011 and asked them if they were interested in reclaiming their Dreaming, Sleeping Beauty tongue with the assistance of a dictionary and brief grammar written in 1844 by Clamor Wilhelm Schürmann, a German Lutheran missionary. At the first meeting, on 14 September 2011 at Zuckermann's Adelaide University office at the Napier Building (North Terrace, Adelaide), he asked the five Barngarla representatives whether or not they would like to reclaim their heritage tongue and thus to improve the Barngarla people's wellbeing, mental health, cultural autonomy, intellectual sovereignty, spirituality, and education. They told him: 'We've been waiting for you for fifty years!'



*Figure 1: Barngarla Workshop participants, Galinyala (=Port Lincoln), South Australia, 12 July 2018
Barngarla language reclamation activities*

Since then, activities have included:

- Conducting various Barngarla language reclamation workshop in Eyre Peninsula, involving more than 120 Barngarla people.
- Establishing and consolidating the Barngarla Language Advisory Committee (BLAC).
- Creating a user-friendly Barngarla dictionary [20], improving Schürmann's original 1844 dictionary.
- Creating an elaborate grammar Powerpoint (thousands of slides).
- Improving and maintaining the Barngarla language website: www.barngaralanguage.com (accessed 1 February 2019).
- Administering the *Barngarla Peoples of South Australia* Facebook www.facebook.com/groups/Barngarla/, attracting approximately 600 members.
- Conducting a narrative psychotherapy (especially suitable for oral, story-telling cultures such as Aboriginal ones) – art – language project (with Nexus Art), entitled 'Barngarla Stories of Resilience', resulting in a 'One Love, One Family' art exhibition of works by 'Stolen Generations' Barngarla people and their children (7 November 2014 – 21 December 2014, Port Augusta; 10 October 2015 – 13 November 2015, Adelaide: <http://nexusarts.org.au/event/one-love-one-family-barngarla-stories-of-resilience/>, accessed 15 April 2018).

- Recording Barngarla songs before the elders who remember some of it pass on (supported by the Yitpi Foundation, Nexus Art and the Australian Government) – see ‘Barngarla Song Project’: <http://nexusarts.org.au/programs/barngarla-songs/> (accessed 1 February 2019).
- Trying to change the *langscape* of Eyre Peninsula by urging councillors and other players to introduce signs that include Barngarla, for example with the Barngarla name for Port Lincoln: Galinyala.
- Familiarizing the Barngarla people with the Barngarla Dictionary (without sacred words and without vulgar words).
- Teaching Barngarla the Modern Barngarla Orthography.
- Exploring Barngarla within the MOOC *Language Revival: Securing the Future of Endangered Languages* and urging Barngarla people to take the MOOC.

5 A LINGUISTICS TEXTBOOK EXAMPLE

Zuckermann’s forthcoming Oxford University Press book, [6], will provide a comprehensive introduction to revivalistics. As the text makes clear, phonetic issues are central to the subject. When we want to talk about revived languages in the context of a linguistics article, it is thus often important to be precise about small phonetic differences. One can write down pronunciations in IPA, but this is not as immediate or as exact as being able to hear them.

For these reasons, we felt that LARA could add nontrivial value. As an initial experiment, we converted four pages of the second chapter, “Exploring the Revival of Hebrew”, which is phonetically rich. A link to the result can be found on the examples page of the LARA site, <https://www.unige.ch/collector/lara-content/>; here, we show a marked-up source paragraph in Figure 5 and a screenshot of the LARA content in Figure 6.

Intuitively, the feeling of people who have looked at the online passage are that the LARA functionality is concretely useful in terms of making foreign phonetics accessible. This includes the editors at Oxford University Press, who intend to make several LARA-transformed passages available on the book website when it is published.

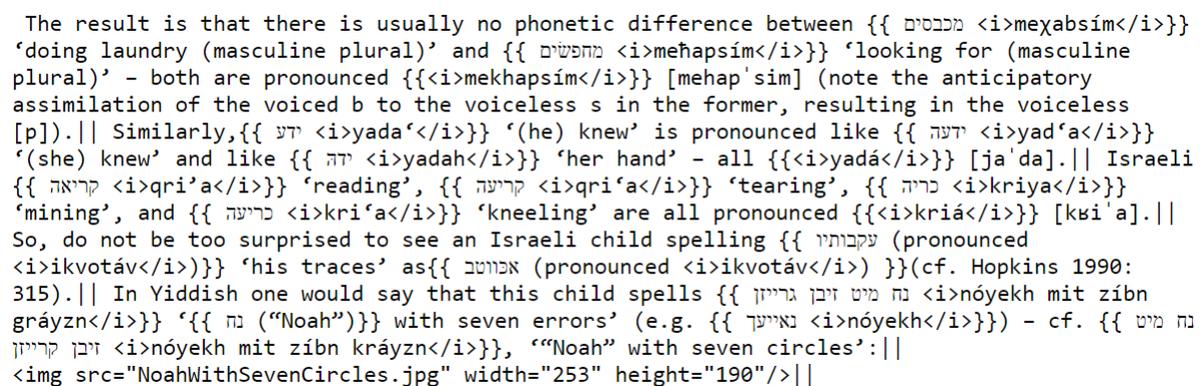
The result is that there is usually no phonetic difference between `{{מכבסים <i>mexabsím</i>}}` ‘doing laundry (masculine plural)’ and `{{מחפשים <i>mehapsím</i>}}` ‘looking for (masculine plural)’ – both are pronounced `{{<i>mekhapsím</i>}}` [mehap'sim] (note the anticipatory assimilation of the voiced b to the voiceless s in the former, resulting in the voiceless [p]).|| Similarly, `{{ידע <i>yada‘</i>}}` ‘(he) knew’ is pronounced like `{{ידעה <i>yad‘a</i>}}` ‘(she) knew’ and like `{{ידה <i>yadah</i>}}` ‘her hand’ – all `{{<i>yadá</i>}}` [ja'da].|| Israeli `{{קריאה <i>qri‘a</i>}}` ‘reading’, `{{קריעה <i>qri‘a</i>}}` ‘tearing’, `{{כרייה <i>kriya</i>}}` ‘mining’, and `{{כריעה <i>kri‘a</i>}}` ‘kneeling’ are all pronounced `{{<i>kriá</i>}}` [kwi'a].|| So, do not be too surprised to see an Israeli child spelling `{{עקבותיו (pronounced <i>ikvotáv</i>}}` ‘his traces’ as `{{אכוטב (pronounced <i>ikvotáv</i>)}}` (cf. Hopkins 1990: 315).|| In Yiddish one would say that this child spells `{{נה מיט זיבן גרייזן <i>nóyekh mit zíbn gráyzn</i>}}` ‘{{נה (“Noah”)}} with seven errors’ (e.g. `{{נאייזך <i>nóyekh</i>}}`) – cf. `{{נה מיט זיבן קרייזן <i>nóyekh mit zíbn kráyzn</i>}}`, ‘“Noah” with seven circles’:||


Figure 5. Source LARA version of paragraph from “Revivalistics”. Phrases associated with audio are enclosed in double braces, {{ ... }}.

6 A LANGUAGE PRIMER EXAMPLE

As noted in the previous section, phonetics plays an important role in language reclamation. A speaker of a revival language is expected to import considerable phonetic baggage from his/her mother tongue(s), resulting in hybridic phonetics within the revival language. For the revival languages referred to in this article, Israeli and Neo-Barngarla, the phonetic cross-fertilization will be mainly between Hebrew and Yiddish, and between Barngarla and Australian English, respectively. Despite the inevitable hybridity, Aboriginal/minority people reclaiming their Sleeping Beauty tongues would like to hear the original pronunciation. They are also interested to know the differences between the original pronunciation and the emerging revival one.

The result is that there is usually no phonetic difference between *מכבסים* *mexabsim* ‘doing laundry (masculine plural)’ and *מהפשים* *meħapsim* ‘looking for (masculine plural)’ – both are pronounced *mekhapsim* [mehap'sim] (note the anticipatory assimilation of the voiced b to the voiceless s in the former, resulting in the voiceless [p]). Similarly, *ידע* *yada* ‘(he) knew’ is pronounced like *ידעה* *yad'a* ‘(she) knew’ and like *ידה* *yadah* ‘her hand’ – all *yadá* [ja'da]. Israeli *קריאה* *qri'a* ‘reading’, *קריעה* *qri'a* ‘tearing’, *כרייה* *kriya* ‘mining’, and *כריעה* *kri'a* ‘kneeling’ are all pronounced *kriá* [kri'a]. So, do not be too surprised to see an Israeli child spelling *עקבותיו* (pronounced *ikvotáv*) ‘his traces’ as *אכווטב* (pronounced *ikvotáv*) (cf. Hopkins 1990: 315). In Yiddish one would say that this child spells *נה מיט זיבן גרייזן* *nóyekh mit zibn gráyzn* ‘נה (“Noah”) with seven errors’ (e.g. *נאייעך* *nóyekh*) – cf. *נה מיט זיבן קרייזן* *nóyekh mit zibn kráyzn*, ‘“Noah” with seven circles’:

Figure 6 Online LARA version of paragraph from “Revivalistics”. The reader can hear any phrase marked in red by hovering the mouse over it.

Bargarlidhi Manoo (“Speaking Bargarla Together”; [21]) was published in 2019. It introduces the Bargarla to various lexical items in their language. A problem, however, is that it is not possible in a book of this type to use IPA, which will be unfamiliar to most of the intended audience. The section on pronunciation is thus forced to describe Bargarla sounds primarily in terms of their similarity to English sounds. This inevitably runs into difficulties with sounds that do not occur in English, such as retroflex consonants and word-initial ‘ng’. Our second experiment has been to produce two different LARA versions of *Bargarlidhi Manoo*, one with audio recorded by Ghil’ad Zuckermann and one with audio from members of the Bargarla people. Links to both versions are again available from the LARA examples page.

Figures 7 and 8 show examples of marked-up source and a screenshot for a sample page. In the source, note use of a page-dependent CSS stylesheet, image tags, and tabular layout.

7 CONCLUSIONS AND FURTHER DIRECTIONS

We are still at an early stage in using LARA for the type of text considered here, but we find these initial examples encouraging. As well as envisaging further use of LARA for such texts as they pertain to traditional linguistics papers/resources, a use for scientific papers has been suggested. That is to say, for disciplines with high rates of technical jargon which create the same sort of barrier to understanding as any unfamiliar language does.

In the year of Indigenous Languages, as proclaimed by the UN for 2019, we note that the technology of LARA is responsive to minority languages and, indeed, we have begun development of LARA with examples ranging from the Bargarla described in this paper to Icelandic, and spanning not just the hemispheres, but the centuries as well – see for example the Middle High German and 14th century Italian examples on our site. We are doing everything we can to ensure that LARA is as accessible to minority languages as it is to the dominant ones.

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```
<page css_file="alphabet_page.css">
<table>
  <tr><td></td><td>Fish<br>{{Gooya}}|</td></tr>
  <tr><td></td><td>Flower<br>{{Boordnoo}}|</td></tr>
</table>
```

Figure 7. Source LARA version of page from “Bargarlidhi Manoo”. Phrases associated with audio are enclosed in double braces, {{ ... }}. HTML is used to specify the tabular format, insert images, etc.

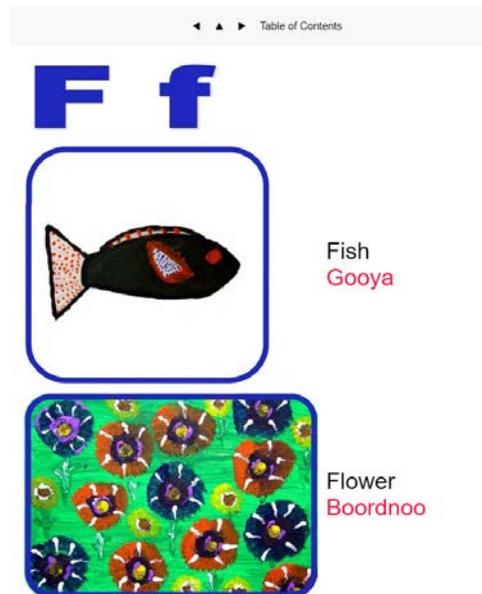


Figure 8. Online LARA version of page from “Barngarlidhi Manoo”. The reader can hear any phrase marked in red by hovering the mouse over it.

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