Why Work with Computers? A Comparison of Using A→Z+T with Pen and Paper Participatory Methods

Beta Test on Zulgo

A→Z+T was tested in the Zulgo [gnd] language of Cameroon in November 2020, during five work days in Yaoundé, Cameroon. We checked an existing LIFT database with ~2.4k words. Within that database, we checked three sets of roots, which were sorted for tone class to provide underlying tone melody hypotheses for later testing. 33 CVC nouns were sorted in four tone frames, resulting in three melodies. 99 CVC verbs were sorted in four tone frames, resulting in at least three melodies, and 145 CVCV nouns were sorted in isolation, resulting in at least eight melodies. Most of the above plus 85 CVCV verbs in isolation were recorded, resulting in 686 96khz/24bit sound files — parsed, labeled meaningfully (for part of speech, syllable profile, lexicon sense id and gloss), and added to the database, by the end of the fifth day.

This page is mostly based on that trial run of A→Z+T. It has also been updated (though mostly affirmed) by work since, including a follow up two week workshop with Zulgo, and two two-week workshops with Chufie' [bfj], all in the first half of 2021.

Where Pen and Paper Methods are Better

I don't want anyone to think that I imagine that A→Z+T captures all the value of pen and paper participatory methods. However low we make the bar on using this computer program, there will always be some people (language community members and others) who simply prefer pen and paper over computers, for a number of reasons.

Flexibility

Pen and paper methodologies are ultimately *flexible*, whereas A→Z+T contains instructions for the computer written in advance, and we cannot anticipate every eventuality (as with any procedure developed in advance). That said, I hope we have captured much of what is normally done in a pen and paper workshop in this computer model.

Accessibility

Pen and paper methodologies are ultimately *accessible*, in that anyone can participate, (almost?) regardless of education and second language skill. Computers pose a particular barrier to participation, which pen and paper methods avoid altogether. However, I believe we have lowered this barrier to participation significantly with the A→Z+T user interface. Additionally, it is not clear how many people the computer barrier effects, especially when compared with the attractive advantages of using computers. That is, will the number of *people who* **participate** *because computers are used* be more or less than the

number *who **don't participate** because computers are used*? My impression is that, given the choice, most Africans (that I have worked with) would prefer to use a computer —even the farmer who has never used one before.

Summary

So while pen and paper methods maintain superiority in their flexibility and accessibility, it isn't clear how much of an advantage these are, in terms of functions actually requiring flexibility (and thus available to pen and paper but not A→Z + T), and in terms of the net impact of computer use on the engagement and involvement of people.

Where A→Z + T Performs About the Same as Pen and Paper Methods

It is also important to acknowledge where A→Z + T models pen and paper methods adequately, without providing any particular improvement.

Sorting Time

Perhaps the most important non-change for A→Z + T is the time and energy required to sort words well. Whatever changes there may be in the filtering, storing, and processing of words before or after the actual sorting process, that process remains much the same: People who speak the language must consider words and phrases, and make judgments as to whether they are the same or different. This process is *work*, requiring training in the beginning stages, and time and energy throughout. So it is good that A→Z + T doesn't provide much change here, because we want to capture native speaker judgments in a future proof manner, not short circuit them. So whatever method you use, plan time to train people to hear tone, and to distinguish one surface tone melody from another –and don't think that A→Z + T is going to reduce that.

Where A→Z + T is Better

Sorting and Filtering

Apart from the sociological advantages of involving people in the sorting of cards, I don't think I know anyone who would prefer sorting a lexical database on physical cards if doing it on a computer were possible —so I think this advantage is clear. At a pen and paper workshop, one separates nouns and verbs initially, and maybe syllable profiles within those sortings. And maybe none of those sortings have to be done again, if you keep track of your piles. But any further sorting is done and undone by hand, each time it is done. No matter how many changes are made to the LIFT database, A→Z + T presents up to date and accurate data for each sorting, with minimal wait.

Tracking Changes

A→Z+T tracks changes in the LIFT file as they are made. This is likely less efficient than the typical pen and paper method, which marks changes after a sort pile is verified. But because the time to make the change in the LIFT file is negligible, it can be done on the fly, meaning that

- sorting progress is stored in the LIFT file as the work progresses, in case it is interrupted, and
- we avoid altogether the process of going through each card, to mark it for which group it sorts into.
- we avoid altogether the need to type all those card notations into another database later (another day, month, or year).
- Essentially, as soon as a language judgment is made, it is put into the database, and is available to the analyst (who we assume is smart enough to not make too much of that data before it has been verified).
- The process of sorting and verification is more interruptable without negative effects (like wind or animals disturbing piles of cards that were only partially sorted)

Presentation of Data in Frames

The tone frames used by A→Z+T are compositional and not particularly intelligent, but for those people from high context cultures (like many Africans), it is a clear advantage to see the whole of the frame being compared with the whole of each of the other frames. For example, if pluralization of a noun comes with a prefix and suffix, A→Z+T presents all of that information (i.e., pfx-N-sfx) to the user during the sorting phase (for the word being sorted, as for piles into which it is being sorted), the verification phase (for each framed word being verified as belonging to the same group), the joining phase, and during recordings. So there is never a time that a speaker is asked to make a judgment about a word in a given context, without actually seeing it in that context, along with any comparative words also in that same context.

Tracking Frames

A corollary advantage of A→Z+T presenting data in frames is that it *stores* the forms and glosses used in sorting in the LIFT file, so this information is available later. This is perhaps done in some pen and paper methods, but work that I have observed usually has used shorthand notes on cards, writing as little as possible to make groupings clear (because of the work of writing it on each applicable card). So if a tone grouping is indicated for "plural", for instance, but later research shows multiple pluralizing morphemes, one has to deduce which one was used in the sorting. But with A→Z+T, whatever is presented to the user for sorting is recorded in the database, and thus remains available as the data is analyzed later, in case questions or unexpected hypotheses arise.

Efficient and Organized Recordings

The burden of processing (even a couple) hours of recordings into individual utterances, saving and naming them meaningfully, and entering those files into some kind of database, should be known to most fieldworkers. Some work hard to make this happen (and feel keenly the time to do so), whereas others simply don't. But A→Z + T offers a workflow to get large amounts of recorded data parsed, organized, and entered into the database with a much smaller burden of time and energy.

For instance, at the end of the five day beta test with Zulgo, we had 686 sound files, parsed, meaningfully named and stored in the repository, with links to each in the LIFT database. Recording these took significantly less time than the actual sorting of each of these framed words. Another two weeks brought the number to 3,157. And in four weeks of sorting and recording, the Chufie' did 2,669 recordings. Each of these recordings is named with relevant meta-data:

- Part of Speech/Grammatical category
- Frame Name (for recordings of tone sorting)
- Unique sense id (32 character hexidecmal, uniquely identifying that sense in the whole LIFT database)
- The field recorded: example, lexeme, citation or field (plural or imperative)

A→Z + T includes options to augment an initial (and potentially very rough) word list collection to record citation or lexeme forms, or plural or imperative forms, if present. This means that the advantage of efficient recording can be had both before and after sorting words in tone frames.