Some Guidelines for Phonological Descriptions

Rod Casali

SIL

March 2000 (slightly revised March 2006, with minor edits 2008)

1 Introduction

This is an attempt to give some advice on preparing phonological descriptions. It is neither an exhaustive description of everything that should be covered in a description nor a step-by-step guide to doing phonological analysis or writing a description. Rather, it contains some general methodological guidelines and some specific suggestions for handling certain areas that, in my experience, have proved troublesome for language teams doing a phonological description of a Ghanaian language. My hope is that making these available beforehand to teams with whom I may be consulting on phonology will save some time and effort both for myself and the team.

These guidelines represent my own opinions. They depart in some respects from what is taught at some of the SIL schools. Although I feel strongly about some of these issues, I recognize that the recommendations made here do not represent the only way of doing things and I do not expect everyone to agree with them. A language team should have freedom to approach phonological analysis and description in a way they are comfortable with, as long as the important facts and generalizations are clearly and accurately presented, and provided that the format and style conform to generally accepted academic standards.

This is a preliminary version of what I hope will eventually become a more extensive and polished document. Comments, corrections, and suggestions are welcome.

2 Some General Guidelines

Be prepared to invest a lot of time; be patient. Phonological analysis is a difficult and time consuming task. Writing up an analysis in a clear and coherent fashion is something many people find even more difficult. Neither task is something to be rushed. Be prepared to invest a few months working on analysis and description, even after most of the data is in place. Also, there is something to be said for spreading out phonological analysis over a longer period of time, while you are working on language learning and other tasks, rather than trying to accomplish everything in one massive push.

Make a clear distinction between phonology and orthography. Within the context of SIL language work, phonology is of course very closely related to orthography, and indeed the development of a practical orthography is usually one of the main (or perhaps the main) reasons for analyzing phonology as part of a language project. Nevertheless, a phonological analysis should be based as much as possible on objective criteria and should not be influenced by orthographic preferences. Not only is it undesirable to allow orthographic considerations to influence the phonological analysis, it is entirely unnecessary, as there is no reason why the phonological analysis and orthographic decisions must coincide at every point.

It is not even necessary for a phonological description to take an analytical stand on every issue that potentially has orthographic implications. As an example, consider the case of labialized consonants. Orthographically, there are two main ways in which these have been represented in African alphabets. One alternative has been to use vowel sequences, e.g. [Cwa] is represented orthographically as kua. The main alternative of course is to use a w and represent such sequences as kwa. For purposes of orthography, a choice between these alternatives cannot be avoided; some consistent standard must be adopted. Linguistically, however, the evidence sometimes fails to point clearly to either /kua/ or /kwa/ as the preferred phonological analysis; arguments can be found for both possibilities. In cases where the evidence is equivocal, presenting detailed arguments in an effort to justify one phonological analysis over others seems unnecessary and unprofitable at best, and even potentially confusing or misleading. A better alternative in such cases might be to simply state the possibilities and leave the question unresolved. (See below under *Labialized and/or Palatalized consonants* for one suggestion as to how this might be done.)

Failing to take a strong stance on the analysis of labialized consonants in the phonology does not make it impossible to come up with an acceptable orthographic solution. Where the linguistic analysis is indeterminate, the choice between u or w as the orthographic representation can be made on the basis of other factors such as popular preference or consistency with the orthographies of some language(s) of wider communication. Even in cases where it is possible to find fairly clear evidence in favor of one or the other phonological analysis, sociolinguistic factors may in

some cases warrant the adoption of the orthographic alternative which does not correspond most directly to the linguistic analysis.

None of this is meant to deny the fact that orthographic choices should be based as much as possible on sound linguistic analysis. I am simply claiming that (1) the direction of influence should be one-way, i.e. phonological analysis should not be influenced by orthographic preferences, and (2) orthographic decisions need not match phonological analysis exactly at every point, especially in cases where the phonological analysis is not clear cut. Phonological analysis is only one of the factors that influences orthographic decisions, and arguably not the most important one.

Although development of a good practical orthography and pedagogical literacy materials may well be the most important goal of phonological analysis, it is not, in most SIL entities, the only one. Historically, most SIL entities have expressed the goal of making the results of language research carried out by entity members to the academic community, government agencies, missionary colleagues, and others. Failure to make an adequate distinction between orthographic and linguistic concerns may in some cases lessen the value of a description for these other parties. For example, the author of a phonology description might be tempted, in presenting phonetic transcriptions in the description, to ignore phonetic details which (perhaps for non-linguistic reasons, such as national orthography requirements) he/she does not expect will be represented in practical orthography. The fact that the phonetic facts in question are not represented in the orthography need not mean however that they are not of interest to scholars who might read the description. Even sub-phonemic (i.e. allophonic) details, let alone "sub-orthographic" details (those which one has chosen not to represent orthographically, for either linguistic or non-linguistic reasons) might turn out to be of considerable value to some scholars. Orthographic considerations do not provide a good basis for deciding what information to represent in a phonological description.

Consider your intended audience. If you are writing something for eventual publication even electronically it will often be best to assume that you are writing for readers who are professional linguists. This is not to deny the fact that other parties may also be interested in your description, including government agencies, missionaries with other organizations, and literacy specialists. It is difficult or

impossible however to write a description that is ideally suited to the needs of all of these different categories of people. A description written for professional linguists represents in some respects the most difficult and exacting standard. If your description succeeds in meeting the needs of this group, it will to a large extent serve the requirements of most of these other groups as well. The converse is not necessarily true, at least to the same extent. A further reason for writing with professional linguists in mind is that this is likely to be the largest category of potential readers of a published phonology description.

3 Qualities of a good description

A good description should clearly present the facts and generalizations about the sound system of the language. It should not recapitulate the steps by which you arrived at your understanding of those facts and generalizations. It is not necessary, for example, to include a phonetic work chart with phonetically similar segments circled.

It is also not necessary to take a definite analytical stand on every issue that can potentially be decided in more than one way. Where the evidence does not clearly favor one alternative over the other(s), it is completely legitimate to simply present the possibilities and leave the decision to the reader. It is also reasonable to simply select one of the possibilities more or less arbitrarily with a note that your decision is tentative.

One quality that is very important is **consistency**. If for example you decide to analyze labialized consonants as /Cw/ clusters, then you should not also include them as independent phonemes in your phoneme chart. Also, if a sound is an allophone of some other phoneme, then it should not appear in the phoneme chart.

It goes without saying that **clarity** is also important. A common difficulty I have observed is that people tend to assume too much awareness on the part of the reader. This shows up in several ways. First, important information is sometimes not explicitly stated. A common example of this is where long lists of data are presented without any explicit discussion of their significance, or where examples illustrating several different points are lumped together in a single group, with no attempt to sort out what each is demonstrating. Also, writers often tend to assume that the reader is fully aware of whatever information has already been presented to that

point. In fact, someone who is not already familiar with the language will probably find it difficult to remember a fact mentioned in passing 20 pages previously. So it is often helpful to include reminders, e.g. “as stated previously, there is no contrast between labialized and non-labialized consonants before round vowels.” Similarly, there may also be points at which you find it expedient to briefly state some claim without going into detail until later. In such cases, it is helpful (and reassuring) to the reader if you note your intention to return to the matter, e.g. “this is discussed more fully in section .... below.”

Another clarity issue is related to sentence style. People sometimes use a very terse writing style, with very short sentences and few logical connectives. This is okay in places, for example it is often possible and desirable to describe the allophonic variants of a phoneme in short, succinct statements. (Even here, however, you want to vary the sentence format a bit so that the description does not sound too repetitive.) In other places, especially where you are presenting arguments for some analysis, logical relationships must be made explicit if the reasoning is to be clearly understood. This generally requires longer sentences with connectives and some embedding.

Example:

Less clear: “I have analyzed [ɾ] as an allophone of /d/. It occurs intervocalically. [d] occurs word-initially and following nasal consonants.”

Clearer: “**Since** [ɾ] occurs **only** intervocalically, while [d] occurs **exclusively in other contexts** (word-initially and following nasal consonants), I have analyzed [ɾ] as an allophone of /d/.”

The highlighted words in the second description convey some information which is missing in the first. The word “since” makes the logical relationship explicit. The words “only” and “exclusively in other contexts” make it clearer that the environments are non-overlapping. (It is true that someone reading the first description would probably have assumed this; the point however is to make it as easy as possible for the reader to understand what you intend to say.)

Of course it is also important to avoid the opposite problem of using sentences which are too long and/or complex to be easily understood. Where you have a

sentence that is longer than four or five lines, ask yourself whether it would be possible to break it into shorter pieces without loss of information or damage to the logical flow of your argument.

Idiosyncratic terminology (and especially abbreviations) can also be a barrier to effective communication. Try as much as possible to use commonly accepted terms, e.g. “consonant” rather than “contoid.” (Of course, knowing which terms are widely accepted is not necessarily easy. It is interesting to note, for example, that whereas “contoid” is rarely used by phonologists, the parallel term “vocoid” has been undergoing something of a resurgence in popularity, though with a rather more restricted usage than it had in earlier frameworks.)

The primary rule of thumb with respect to all issues related to clarity is to put yourself in the shoes of the reader, by asking yourself whether each piece you write is likely to be clear to someone who is linguistically trained but is not already familiar with the facts of your language.

It is also important that a description be as **complete** as possible. Just how much information it should contain will most likely depend in part on the publication outlet (if any) it is intended for. However, there are certain kinds of information that virtually any phonological description ought to contain.

One thing that should certainly be expected of any description is a clear listing of the phonemes of the language, together with their allophones, and evidence to show the phonemic contrasts. Most descriptions generally achieve this goal, although it is certainly possible to find cases where an allophonic statement is unsatisfactory, either because the proposed rule for complementary distribution is not very natural or plausible, or because the statement is too vague (e.g., “x and y do not appear to contrast; rather they appear to be allophones of the same phoneme,” with no further details about their distributions). It is also possible to find cases where the examples given to demonstrate a contrast are not convincing (see below under *Quantity of data*).

An important type of information that is not always supplied very fully is phonotactic information. It is not sufficient to note which phonemes exist in a language; a linguist reading your description will almost always want to know in

which environments they can occur. Below are some examples (by no means an exhaustive list) of the kinds of information that should be included.

- Do labialized and non-labialized consonants contrast before round vowels as well as non-round vowels? If so, does this contrast occur before high vowels, or (as is more common) only before non-high vowels?

- Do nasal and oral vowels contrast next to nasal consonants?

- What are the possible syllable- and word-final consonants in the language?

- Are there any consonants that do not occur word-initially?

- Which phonemes can occur in affixes or function words? (Often this is a very restricted set.)

- Is there vowel harmony within roots? Do affix vowels harmonize?

- Are there restrictions on the vowels that can occupy certain word positions? (Mid vowels are largely excluded from final CV syllables in Dagbani, for example.)

With respect to syllable-types, information like the following (again, not exhaustive) should be noted:

- Are V(C) syllables limited (as in many West African languages) to word-initial position?

- If the language permits word-initial V syllables, do these ever contain long vowels?

In answering these (and other) questions, be careful to distinguish between well-attested patterns and those for which there are only a few examples. Also, be careful to distinguish between ambiguous and unambiguous structures. If for example someone decides to analyze labialized consonants as /Cw/ sequences in a language which otherwise lacks CC clusters, this will introduce a new syllable type(s), CCV. When such a syllable type is listed in the section on syllable structure, it should be clearly stated (even if the information is already recoverable from other

parts of the description) that CC in such structures is always limited to Cw. The reader needs to know that the CCV pattern could perhaps be regarded as an artifact of your analysis, and does not represent an uncontroversial fact about the language itself.

As far as word types/structures are concerned, many languages have significant limitations on which phonemes can occur in non-initial syllables, especially in verbs. (In many cases, this may be because these non-initial syllables were historically suffixes.) Any such limitations should be clearly described. Also, there are usually clear limitations on the number of syllables in verbs (and perhaps nouns as well). It is often the case, moreover, that only certain syllable types are possible in non-initial position. In Nawuri, for example closed syllables are rare as the second syllable of disyllabic verbs, and absent almost entirely (in any position) in verbs of three syllables.

Explicitly stating that something does not occur can be just as useful as stating what does occur. Such information is easy to overlook when writing a description. Here again, the best rule of thumb is to put yourself in the shoes of the reader. What kinds of things would someone conceivably want to know about the language? This can be difficult to know, but it is important to make an attempt. Here are some examples of things whose absence ought to be explicitly noted, if only because they do occur in many other West African languages:

- long vowels
- vowel harmony
- nasal vowels
- downstep
- downdrift

Be especially careful to note any feature which, though lacking in the language you are describing, is present in most other languages in the family.

One way of ensuring that phonotactic restrictions are systematically investigated is to use co-occurrence charts. Nice examples are found in many of the Collected

Language Notes volumes produced in Ghana. (See also Burquest & Payne's textbook, pp. 49-59.)

4 Data and Examples

The usefulness of a description is to large extent proportional to the quality (accuracy, consistency of transcription), quantity, and presentation of the data it contains.

4.1 Accuracy of data

Obviously, this is crucial. Someone who has bad data is hardly likely to come up with a good analysis, however good a phonologist they may be. Many of the serious problems in phonological analyses of African languages (e.g. failure to detect one or more phonemic contrasts) have in fact been due, directly or indirectly to inaccurate phonetic data. Vowel and tonal contrasts in particular are notoriously difficult to hear.

Some guidelines:

Be prepared to invest a lot of time learning to hear the different sounds in the language. Do not expect it to be easy. While a certain amount of analysis is important even during language learning (it is easier to learn to produce the sounds of a language accurately if you know which ones are there), there is a lot to be said for postponing extensive data collection until after you have been in the language long enough to give your ears time to adjust.

Maintain a healthy distrust of your data. Be willing to revise your data; initial transcriptions should always be viewed as tentative. Always be alert to the possibility that there is a contrast you are not hearing, especially in the case of vowels. For example, if native speakers tend to write vowels differently that you hear as the same, this may be a clue to the fact that the vowels are actually different. (Of course such evidence needs to be taken with a grain of salt, as there may be other reasons why native speakers would choose to write them differently.) Also, if your data imply a phonological pattern that is either cross-linguistically uncommon or without clear precedent in the language family you are working in, be open to the possibility that there is something you are not hearing correctly.

Strive for consistency in transcription. The fact that you may be failing to hear some contrast in the early stages of your work need not be a serious problem in and of itself, as long as you are always writing the sounds which you can reliably distinguish with a consistent symbol. Suppose for example that there are vowels in certain words which you sometimes hear as [e] and sometimes as [ɪ] but which you suspect are all the same sound. (Or at least you are not very confident that they are different.) In this case it may be best to arbitrarily but consistently employ one of these symbols to the exclusion of the other, until such time as you are certain whether all the vowels represented by this symbol are in fact the same sound. This will at least avoid introducing spurious variation into your data due to inconsistent transcription. It will also facilitate computer searches of your data.

Look for contrastive differences among sounds before you worry about their exact phonetic identities. In the case of vowels in particular it is often easier to determine how many contrastive heights you have in the language than to decide exactly what the exact phonetic identities of all the vowels are.

Realize that many allophonic processes have gradient outputs. Suppose for example that voiced consonants tend to become voiceless utterance-finally in some language. In languages in which this happens, the degree of devoicing is often incomplete, e.g. /d/ may surface in this context as something intermediate between [d] and [t]. In such a case it would be a futile exercise for a linguist to agonize over whether he/she is hearing [d] or [t] in the pronunciation of a particular word; where it is difficult to decide it is most likely because the result is simply intermediate. A great many processes that have commonly been described using discrete categories are in fact typically gradient. Examples include the tendency of vowels to be nasalized before nasal consonants, the tendency of consonants to be rounded (labialized) before round vowels, and the tendency of vowels to shorten (leading in the extreme case to complete elision) in certain contexts.

Be familiar with what happens in related languages. Although there are of course exceptions, the tendency for closely related languages to have similar phonological systems is very strong. So while it is of course important to be open to the possibility that your language differs in its sound pattern from those to which it is most closely related, it is entirely reasonable to let your expectations (and

consequently, the things you choose to investigate) be guided by what has been found in closely-related languages.

Avoid an overly inductive approach to phonological analysis. Phonological analysis is often presented as a two-step, unidirectional process: first you gather your data, and then you analyze it according to well-defined, almost mechanical procedures. Logically, it is certainly true that ultimately the phonological analysis should be determined by the phonetic data and not vice-versa. Methodologically, however, the problem with adopting this kind of strict separation of data-gathering and analysis is that you are entirely at the mercy of your data. If this is to any degree inaccurate, your analysis is also likely to be off target. When one considers that in practice it is extremely difficult to ensure that your phonetic data are entirely correct, even if you have a good ear, this is clearly cause for concern. A better approach is to view the methodological relationship between data gathering and phonological analysis as a two-way street. This means that you not only allow your data to determine your phonological analysis, but you also allow your developing hypotheses about the phonological system of the language (which should be based in part on expectations about natural phonological systems and processes) to determine the kinds of data you collect and to suggest areas in which your data could conceivably be wrong.

The kind of thing I have in mind here can best be illustrated with an example, which has actually arisen in several real cases. Suppose you are working with a language with a subject pronoun that is either [o] or [ɔ], depending on the vowel of the root to which it is attached. (For simplicity, we will consider only CV roots.) Before roots with [u] or [i], the pronoun is regularly [o], while before [ɔ] or [ɛ], it is regularly [ɔ]. Suppose however that before roots whose vowel you have transcribed as [o], the results are inconsistent, in that before certain such roots the pronoun surfaces as [o], whereas before others it surfaces as [ɔ], e.g. you find [oko] 'he/she does X' but [ɔso] 'he/she does Y'. One possibility you might be inclined to check in this case is whether the quality of the vowel is determined, in whole or in part, by the consonant of the root. Although it would not hurt to check this out, the absence of a plausible phonetic reason why [ɔ] would be favored before [s] but [o] before [k] should cause you to be rather pessimistic about this possibility. Consequently, you would hopefully not invest a lot of time trying to make this

analysis work once it became clear that any rule for predicting the vowel quality based on the following consonant would need to be complicated at best.

In terms of both phonological naturalness and precedent in other African languages, a much more promising possibility is that the quality of the pronoun vowel is determined by that of the root vowel, in particular by its tenseness / laxness (or [ATR] value, to use a more current term). This kind of agreement appears to be at work with the other vowel heights in any case: [u] and [i], which are tense vowels, trigger a tense pronoun vowel [o], while [ɔ] and [ɛ], which are lax vowels, trigger a lax vowel [ɔ]. If you are aware, moreover, that many African languages have a high lax vowel /ʊ/, and that this vowel is phonetically often very similar to [o], then the obvious possibility to consider is that the root vowel in [ɔso] is actually [ʊ] and not [o]. This should cause you to go back and listen to your data more closely, to see whether the vowels in the roots [ko] and [so] are in fact the same. It would also be a very good idea to solicit the phonetic opinions of other people on this, including both native speakers and other linguists, and to look for possible minimal pairs, e.g. is there another word [ko] (with a different meaning) which takes the lax pronoun variant [ɔ], or another word [so] which takes the tense pronoun [o]? If so, and if moreover the tone patterns on the two [so]'s or two [ko]'s were identical, then finding out whether native speakers could in fact tell the words apart when they are pronounced (by another native speaker) in isolation should definitively settle the question of whether the two vowels are the same or different. (Of course, you would ultimately hope to find a larger number of examples to illustrate the contrast and not base your entire analysis on one or two minimal pairs.)

This is not to say that you should ever alter your phonetic transcriptions simply to support a particular phonological analysis, however natural or expected this analysis might be. Ultimately, you must be true to what you are hearing. The point here is simply that you should allow phonological considerations, in particular expectations about naturalness and your knowledge of the phonological systems of related languages, to suggest possible points at which your phonetic transcriptions may need to be re-examined. This cannot be stressed too strongly. I believe, for example, that if sufficient attention were paid to the significance of kind of pronoun agreement situation just described, a number of real cases in which /ɪ/ and /ʊ/ went undetected in a phonological analysis might have been avoided.

Have someone else listen to your data. No matter how good an ear you have, this never hurts. It is always possible that someone else may pick up on something you overlooked. At a minimum, you should expect that the linguistics consultant who checks your analysis will want to listen to some of your data on tape, to satisfy him/herself that your transcriptions are accurate. Beyond this, you might want to have other co-workers listen to your data also at various points, especially where you are uncertain about how to transcribe a particular sound.

Make appropriate use of computer speech analysis tools. Although there are pros and cons (or at least potential pitfalls) to using a tool like Speech Analyzer, there are certain features that will be of benefit in almost very case. One of the most useful features is the playback feature. Once an utterance has been recorded into Speech Analyzer, you can play it back as many times as you like simply by pushing a key. This is much easier than rewinding a tape or even using a tape loop, in that switching between utterances is also extremely fast and simple. It is possible to zoom in on particular sounds also, for example to listen to a particular syllable in an utterance if you are trying to decide what the vowel is. Storing data in the form of computer files also has advantages over accumulating a box of tapes. Programs like Speech Analyzer have become a lot easier to use in recent years, and I would recommend using them even for language learning purposes.

Less clear-cut is the question of how much to rely on the analytical capabilities of Speech Analyzer. This is something that should depend to some extent on the computer skills, phonetic knowledge, and learning style(s) of the language team. On the one hand, there is no doubt that Speech Analyzer can help to resolve many precisely-formulated phonetic questions about pitch, vowel length, and segment quality. The relationship between the kinds of properties which Speech Analyzer measures (duration, fundamental frequency, formant structure) and an appropriate phonetic transcription is however far from simple and direct. To take a trivial example, it is not possible to arrive at a correct tonal transcriptions simply by looking at a pitch display. Using Speech Analyzer effectively requires a reasonable level of knowledge of acoustic phonetics, such as one might hope to gain through reading an introductory textbook on the subject. (This can be at least as important as knowing the mechanics of actually running the program.) If you are willing to invest the time to acquire this knowledge, Speech Analyzer might prove very helpful. Where this knowledge is lacking, I am not sure that using Speech Analyzer

will necessarily do more good than harm. In any event, you should never try to use Speech Analyzer as a substitute for your own ears. At most, it should be used as an aid in confirming or disconfirming very specific and well-posed questions.

4.2 Quantity of data

At a minimum, a description should have enough examples to adequately support each claim that is being made, for example there should be enough examples to convince a reader of the reality of each proposed phonemic contrast. Where descriptions most often fail to achieve this is in giving examples that do not clearly and unambiguously support the claim that is being made. In the case of contrast, this most commonly involves examples in which the environments are not analogous enough, because they are not free of possible "contaminating" factors which could account for the occurrence of one sound rather than another in a particular context. As a fairly clear-cut example, consider the hypothetical data below, which are intended to show contrast between [e] and [ə] (assume that all these words have different meanings)

[dəli]	[sade]
[aməpo]	[time]
[gəsubu]	[epu]
[ləko]	[le]
	[lejo]
	[geibu]

Although these examples show [e] and [ə] occurring next to some of the same consonants, they fail to convincingly demonstrate contrast, because they are not free from other influences that are potentially relevant. The fact that [ə] occurs only between consonants is highly suspicious, as front vowels centralize in precisely this environment in a number of West African languages. Moreover, in the only two examples in which [e] occurs interconsonantally, its front quality could be due to following front vocoid [j] or [i].

As a less straightforward example, consider the following Nawuri examples which seem to show a contrast between [d] and [ɾ]:

[dɪdaːʔ]	[asɪɾaːʔ]
[gudu]	[guwuɾa]

[gɪdɛːʔ]	[bɪɾɛːʔ]
[kodu]	[koɾubusoːʔ]

In terms of neighboring segments, the environments seem entirely analogous. As these examples are presented, no one would be likely to doubt that [d] and [ɾ] belong to separate phonemes. In fact, however, the examples are misleading in that they fail to reveal several pieces of information. The most important of these is that morpheme boundaries are not shown. In the first three examples in the left hand column, the initial CV syllable is a prefix, thus [d] is root-initial. [ɾ] never occurs root-initially in the examples in the right hand column, nor in any other words in Nawuri. Moreover, almost all instances of intervocalic [d] in non-root-initial position in Nawuri are loan words. This is a second respect in which the examples given to show contrast are misleading: there is no indication of the fact that the word [kodu] is a loan word from Akan.

This example shows very clearly that in demonstrating contrast it is not enough to ensure that the neighboring consonants and vowels are similar. Morphological information is potentially relevant, as is the native or non-native status of a word. While it is impossible to give rigorous criteria for identifying legitimate examples of contrast, there are some general guidelines that you should try to follow where possible:

- Try to ensure that the words in both lists include examples from the same grammatical categories. It should not be the case that one list contains all verbs and the other all nouns, since the verbal and nominal phonologies often differ in some respects.

- Include morpheme boundaries in your transcriptions. (Ideally, try to provide enough information so that the exact identities of individual morphemes are recoverable.)

- Avoid the following categories of words as much as possible: loan words, function words and ideophones.

- Include more examples than you think you need. This way, if one or more of your examples proves less than convincing due to some factor you have

overlooked, you have improved your chances that the examples that remain will still be sufficient to satisfy your reader.

How many examples should be given? A reasonable rule of thumb might be that every non-trivial point made in your description should be supported by at least five or six examples. In the case of contrasts among phonemes, this should probably be increased to at least eight to ten if possible. (For a convenient presentation format for contrast examples, see Mike Cahill's Konni phonology.)

To a very large extent, the usefulness of a description is proportional to the amount of data it contains. Some readers (e.g. those interested in comparative reconstruction) may well be more interested in your data than they are in your conclusions. For this reason, I strongly recommend trying wherever possible to provide more examples than the minimum that would suffice to prove a point you are making.

4.3 Presentation of data

Phonetic data should be given in IPA symbols. SIL IPA fonts should be available from entity computer departments, or can be downloaded from the SIL web site.

Some (possibly unfamiliar) symbols for sounds commonly found in African languages:

[ʃ]	voiceless postalveolar (alveopalatal) fricative
[ʒ]	voiced postalveolar (alveopalatal) fricative
[tʃ]	voiceless postalveolar (alveopalatal) affricate
[dʒ]	voiced postalveolar (alveopalatal) affricate
[j]	palatal glide/semivowel (N.B. [y] is NOT the IPA symbol!)
[ɾ]	voiced alveolar flap
[ɪ]	high front [-ATR] / lax vowel (N.B. the "fish hook" is no longer an IPA symbol)
[ʊ]	high back round [-ATR] / lax vowel

It is entirely permissible to refrain from marking certain low-level predictable phonetic details in your transcriptions, especially where these represent universal tendencies. Examples include nasalization (especially if slight) adjacent to nasal consonants, or aspiration in a language where all stop consonants are lightly

aspirated. Omitting these details helps to keep your transcriptions more readable. Of course, it is important to mention whatever phonetic detail you are omitting, so that no factual information is lost.

Although it is a lot of work to provide morpheme glosses, you will greatly increase the value of your description if you do so. Similarly, tone should be marked if at all possible. At a minimum, the words in your word list must be marked for tone.

5 Content

5.1 Things to include

Acknowledgments. At the very least, you will probably want to thank your language assistant(s) and any consultants or other colleagues who have given you advice and suggestions.

References to previous work on the language and/or related languages. Including references to other work is a relatively painless way to significantly add to the usefulness of your description. This is because relatively few potential readers will be interested in reading your description out of inherent interest in the overall sound system of the language itself. Instead, most linguists will be ultimately interested in how certain phonological phenomena behave in the language, e.g. someone who specializes in tone may want to know what interesting tonal behavior the language contains. Every time you can refer your readers to something that has been written about a similar phenomenon in some other language, you potentially provide them with another source of valuable information that they may not otherwise have discovered. In this way, the value of your description is multiplied.

The accepted format for referring to linguistic studies (books, papers, etc.) is to use the author(s)'s last name(s) and date of publication, as in the following example:

"With regard to the other Guang languages, a great deal of valuable comparative work has been done recently by Snider (1988, 1989a,b), who has also done extensive work on Chumburung (1984, 1985, 1986, 1989c). Other work on Chumburung includes a description of the phonology by Price (1975) and a study of the phonology and grammar by Hansford (1991)."

Note that where you need to cite more than one work by a given author in a single year, these are distinguished using a, b, c etc. after the year, as in the Snider references above. (The choice of which work to label with which letter is arbitrary.)

The full bibliographic references are then listed alphabetically in a (non-numbered) section entitled “references” at the end of the description:

References

Hansford, Keir L. 1991. A phonology and grammar of Chumburung. University of London dissertation.

Price, Norman. l975. Collected field reports on the phonology of Nchimburu. (Collected language notes, l4.) Legon: Institute of African Studies, University of Ghana.

Snider, Keith L. l984. Vowel harmony and the consonant l in Chumburung. Studies in African Linguistics 15:47-57.

Snider, Keith L. l985. Vowel coalescence across word boundaries in Chumburung. Journal of West African Languages XV, 1:3-l3.

Snider, Keith L. l986. Apocope, tone, and the glottal stop in Chumburung. Journal of African Languages and Linguistics 8:l33-l44.

Snider, Keith L. 1988. The noun class system of proto-Guang and its implications for internal classification. Journal of African Languages and Linguistics 10:137-164.

Snider, Keith L. 1989a. The vowels of proto-Guang. Journal of West African Languages XIX, 2:29-50.

Snider, Keith L. 1989b. The consonants of proto-Guang. Journal of West African Languages XX, 1:3-26.

Snider, Keith L. 1989c. Vowel coalescence in Chumburung: An autosegmental analysis. Lingua 78:217-232.

The usual place to include a discussion of previous work on the language (and related languages) is in the introduction or in an early section entitled “previous studies” or something similar. Try to say something useful about the kind of

information these previous studies contain, e.g. “work the syntax of language X includes Davis (1959) and Smith (1980). The phonology is treated by Johnson (1991) , and (to a lesser extent) in Herman (1992).”

Word list. At least a Swadesh 200 (see appendix) is recommended. A longer word list would increase the usefulness of your description if you can provide one. It is extremely important that the list contain phonetic forms. If you also want to add orthographic or phonemic forms, by all means do so, but it is the phonetic forms that are really essential. Be sure to check your transcriptions for accuracy and consistency.

Some notes on the morphology. This is optional, but useful, especially if you do not intend to publish something separate on the morphology.

5.2 Things to leave out

The label “with egressive lung air” when describing sounds. (The reader will assume a pulmonic egressive airstream mechanism unless you state otherwise.)

A chart of phonetically similar segments. The reader does not need to know the steps you went through in order to reach your conclusions, but only whether they can be justified by the facts of the language.

Rules in formal notation. These do not usually tell the reader anything that could not be said at least as clearly in plain English. Also, many people, especially those who have not studied generative phonology in depth or who took their training several years ago may experience difficulty in knowing how to state rules correctly.

Although one might argue that the precision inherent in these rules is an advantage to using them, there are far too many descriptions in which such rules are not stated correctly, with the result that their precise, literal claims are not in fact accurate. Even if you succeed in stating your rules correctly, the fact that many other people have not means that the wary reader cannot afford to give you the benefit of the doubt and take your rules at face value, in the absence of explicit prose statements that make it clear exactly what you intend to say.

Although I do not recommend including formal rules in a description, they are however potentially of great value as an analytical tool as you are trying to discover

the generalizations that underlie the sound patterns of the language. In this case their precision forces you to ask (and hopefully answer) specific questions that might not otherwise have occurred to you.

Distinctive feature charts. If formal rules are not employed then these serve no purpose.

Explicit discussion of a (language-specific) phonological hierarchy. Although phonologists generally assume that there is a phonological (or "prosodic") hierarchy, it is usually not necessary to discuss in detail the various levels in a description of an individual language. In particular, it is no longer expected that these will vary significantly from one language to the next, nor that a detailed definition of these must be proposed anew for each language. If there is a phonological process or phenomenon that is restricted to some domain whose delimitation does not correspond to some intuitively clear unit, then by all means discuss this. Otherwise, there is little point in explicitly adopting a detailed hierarchy.

A text. It would be unreasonable perhaps to argue too strongly against including a transcribed text, since it certainly does no harm and may be of interest to some. I do not believe, however, that it will be of much use to most people reading your description. In view of the fact that transcribing a text properly can be a very time-consuming exercise, it seems to me that this should be optional at best.

Here again, it is necessary to distinguish between usefulness to you as an analyst and usefulness to the reader. Certainly there is a lot to be gained from using texts in phonological analysis. In fact, it is essential to do a certain amount of this if you want to gain a good understanding of the phonology, because many phonological processes will only manifest themselves in natural connected speech, both because the relevant conditions for the application of some processes arise only when words are combined into phrases (e.g. many languages have a process deleting the first of two vowels that come together across a word boundary), and because the unnaturalness of the elicitation situation can sometimes inhibit processes which might freely occur in less self-conscious speech. So while I do not recommend including a text within your phonology description, I do recommend spending extensive time listening to and transcribing texts as an aid to your own analysis.

A separate section on interpretation. To explain in full detail why I consider such a section unnecessary would take more space than is appropriate here. Roughly speaking, however, I believe that most of the issues commonly discussed in such sections fall into one of the following categories:

- Issues that can be resolved on universal (or near-universal) grounds and therefore do not require explicit discussion in individual languages.

Vowel length is one example of such an issue: phonologists now generally assume that these behave, in all languages, as sequences in some respects and units in others (see below).

- Issues for which there is at least a clear default expectation for West African languages.

Everyone fully expects [kp] and [gb] to pattern as single segments in a Niger-Congo language. In view of this, there is no longer any need to present arguments to show that these are single segments. Affricates likewise are rarely anything other than single segments in Niger-Congo languages and hence do not need to be explicitly discussed.

- Issues which, though genuine, can be dispensed with minimal discussion because the relevant evidence is simple and straightforward.

The question of whether nasal + consonant "sequences" are best interpreted as syllabic nasal plus consonant or as prenasalized consonants falls under this category. Although it is possible to find examples of West African languages that justify both types of analysis, the decision in Gur and Kwa languages is usually straightforward. The facts that (1) the nasal portion is almost always a prefix or clitic, and (2) this nasal portion can generally bear a different tone from that of the following syllable are sufficient to justify the syllabic nasal interpretation. Provided that both of these facts are clearly stated in the description, I feel that the alternative prenasalized consonant analysis does not even need to be explicitly mentioned. If it is discussed, a sentence or two should suffice.

- Issues which, though in principle genuine, cannot be clearly decided on the basis of the available evidence, such that choosing among the alternatives becomes essentially arbitrary.

I believe that the treatment of labialized and/or palatalized consonants often falls into this category, in that arguments comparable in strength can usually be found to support either a single-segment or a CC interpretation. In addition, a further interpretation in which the labialization derives from an underlying round vowel (e.g. [Cw] = /Cu/) is also often possible. In cases where the evidence is not clear-cut, it does not seem to me that a painstaking presentation of the arguments in favor of each alternative is very productive, especially in view of the fact that virtually the same considerations apply in hundreds of languages and the main arguments are by now very familiar to many readers. (See below for further discussion of labialized consonants.)

- Issues which, while often treated under "interpretation" are not, from the perspective of most current theories, questions of phonetic interpretation at all, but rather instances of the general problem of phonological analysis, i.e. discovering the underlying form of a phonetic entity.

A prime example of this is nasal vowels. In many languages these have been analyzed as deriving from VN (vowel + nasal) sequences. However defensible this possibility may be in some languages, it needs to be recognized that the issue is one of phonological, rather than phonetic, interpretation. It is neither justifiable nor necessary from the viewpoint of most current theories to re-transcribe something like [ã] as [an] phonetically. If it is to be derived from a VN sequence, this is properly done at the phonological level, i.e. there is a rule or process which converts /an/ to [ã] .

This does not of course preclude the possibility that one might find it convenient to discuss nasal vowels in a separate section on interpretation. It seems to me however that making an expository distinction between this kind of "interpretation" issue and other questions of phonological analysis is arbitrary and not very helpful.

The number of possible interpretation issues that do not fall under one or the other of the above categories is small. Perhaps the most likely candidate that occurs with

any frequency is the interpretation of vowel sequences (see below). Even in this case, however, a few sentences will often suffice to justify a particular analysis.

All of this is not to say that there is anything unworkable about discussing all interpretation issues in one place, especially if the discussion is appropriately brief and restricted to genuine issues. Certainly many good descriptions have been done using this format, and readers who are familiar with it should be quite comfortable with it. Nevertheless, in view of the facts that (1) the interpretation section is one that people have generally found among the most difficult to write, (2) a number of the issues over which people have agonized arguably do not even need to be discussed at all, and (3) most of those which are worthy of comment can be briefly discussed in connection with other matters (e.g. the treatment of vowel sequences can be nicely handled when discussing syllable structure), I would rather see people leave this section out. I believe that this should also lead to a more reader-friendly description in most cases.

6 Order of Presentation

The exact order of presentation is not necessarily of critical importance; there are a variety of workable alternatives. Here is one such possibility:

Introduction

Phonemes

- Chart of phonemes
- Evidence of contrast
- Description of allophones and their distribution
- Discussion of interpretation issues as needed

Phonotactics

- Syllable structure
- Word structure
- Restrictions on segment occurrence and co-occurrence

Discussion of interpretation issues as needed

Phonological processes (morphophonemics)

Tone

Word list

7 Comments on Specific Phonological Phenomena

7.1 Flap [ɾ]

Most West African languages have an alveolar flap [ɾ]. In Kwa languages, this tends to occur only intervocalically, while in some Gur languages it occurs word-finally as well (in which context it may be phonetically devoiced). I do not know of any Kwa or Gur languages in which it occurs word-initially.

In many languages, [ɾ] is analyzable as an allophone of either /d/ or /l/. The problem is that the environment is not always so easy to identify. In Chumburung, it depends at least in part on the [ATR] category of the vowels in the word (Snider 1984). More commonly [ɾ] is an intervocalic (or, in some languages, postvocalic) allophone of /d/. The matter is complicated however by the fact that morphological boundaries are sometimes relevant as well. In some languages, e.g. Nawuri, /d/ is realized as [r.] intervocalically in non-morpheme-initial position, and as [d] morpheme-initially and when not intervocalic (word-initially and following a nasal consonant). Also, in languages which have [ɾ] as an allophone of /d/ there are usually exceptions in the form of loan words. Many languages have a word [kodu] 'banana' borrowed from Twi, for example, in which the second consonant is not realized as [ɾ].

7.2 Glottal stop

Many languages have some words that end phonetically in a glottal stop when pronounced before pause. While there may be some languages in which all words end in a glottal stop when pronounced before pause, it appears to be more common to find one of the following two situations:

1. The glottal stop is surface-contrastive, i.e. its distribution cannot be predicted. This is the case for example in Chumburung (Snider 1986).

2. The occurrence of the glottal stop is predictably present in some environments and absent in others. Here there are at least two well-attested further possibilities:

a. The glottal stop occurs pre-pausally after every long vowel. This is the case in Nawuri and Gichode (Casali 1995, Snider 1990).

b. Words which would otherwise contain only a single CV syllable receive a final glottal stop when pronounced pre-pausally. This occurs in Birifor (Kuch 1993) and possibly Dagbani. In other words, these languages seem to have a minimal length requirement that all words contain at least two moras (where one mora is contributed by each short vowel or coda consonant).

Since many transcribers have failed to record the glottal stop, all data should be checked carefully for this feature.

As far as analysis and description is concerned, the distribution of the glottal stop, assuming it exists in a language, must be accounted for. Either it must be recognized as a phoneme (albeit a marginal one, since there are relatively few languages in which it occurs in all positions), or some precise rule must be stated to predict where it occurs. (It will not do to simply say that many words end in a glottal stop or something similarly vague.)

7.3 Labiovelars - /kp/ etc.

There is no need to discuss reasons for analyzing these as single segments; no one familiar with West African languages expects them to behave otherwise.

One issue that is of some interest with respect to labiovelars is whether nasals that precede them assimilate completely and become [ŋm], or whether they are just [ŋ]. (Cases have also been reported in which they surface as [m], but this seems to be rare.) This may not be easy to tell, and if you are not sure about the facts there is nothing wrong with admitting it.

A second point worth mentioning is whether labiovelars are realized as implosives.

Suggested reading:

Cahill, Michael. 1996. Labiovelars. MS, Ohio State University. (Available in GILLBT library.)

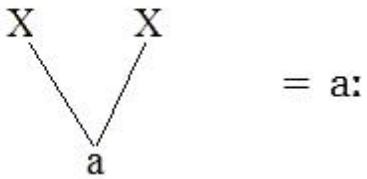
(Mike is working on a survey of labiovelar consonants and would be happy to have additional information about how these behave in African languages. He has developed a questionnaire which I can provide to anyone who is interested in contributing to his survey.)

7.4 Long vowels

A difficulty which these sometimes pose is that the mid long vowels are sometimes phonetically diphthongized, e.g. /ee/ is realized as [ie], /ɔɔ/ is realized as [ʊɔ], etc.

Although it has been customary in some descriptive traditions to discuss whether long vowels should be interpreted as one segment or two, this is no longer viewed by most phonologists as a genuine issue. The reason is that there simply do not appear to be any real cases of a language in which long vowels behave entirely as single segments, e.g. a language in which the phonological and psychological relationship of [i] to [iː] is exactly parallel to that between [i] and [e]. Although the sequence interpretation comes closer to the truth in African languages, it is now generally accepted that long vowels do not vary in their interpretation from language to language, but rather that in every language they behave in some respects as sequences (e.g. with respect to stress or tone assignment) but in other respects as units (e.g. they cannot ordinarily be split by epenthesis).

Formally, vowel length is often represented within current theories as a linkage between a single segment and two timing units or moras:



For descriptive purposes, it is not even necessary to discuss the interpretation of long vowels. It suffices to just state whether or not they exist and establish their contrastive or non-contrastive status. Transcriptionally, it is fine to represent length using a double vowel, with nothing more than a note to that effect. This is such a common and well-accepted practice that it needs no explicit justification. When listing syllable structures, it really makes very little difference whether you describe

long vowels as V: or VV, as long as you are completely clear about which syllable types the long vowels can and cannot occur in.

7.5 Labialized and/or palatalized consonants [kw], [kj] etc.

7.5.1 Overview

Many African languages have phonetic labialized consonants which are in surface contrast with their non-labialized counterparts, e.g. [kwa] contrasts with [ka]. Two different situations are commonly found. In some languages, e.g. Nawuri, the contrast occurs only before non-round vowels. Before round vowels, all consonants are phonetically rounded, although this rounding is not in general very salient (Casali 1990). In other languages, the contrast occurs before both non-round vowels and non-high round vowels. Regardless of how labialized consonants are analyzed, it is very important to clearly state the environments in which they are contrastive.

Palatalized consonants are not as common, but still occur in many languages. Since the factors relevant to their analysis are exactly analogous to those that pertain to labialized consonants, I will simplify things by discussing only the latter.

7.5.2 Analytical treatment

At least four different analyses have been proposed for labialized consonants:

- They are unitary phonemes.
- They are CC clusters.
- They derive from underlying /CUV/ sequences, where /U/ represents some round vowel (typically /u/).
- Labialization is treated as a “feature of the syllable.”

While all four analyses are amply attested, the relevant facts tend not to vary all that much from language to language, at least within Gur and Kwa. In many cases, the following facts obtain:

- Labialization is contrastive only for a subset of consonants (an exception is Chumburung, Price 1975), most commonly (some) velars and labials, but

often palatals as well. (Contrastive labialization of alveolars seems to be somewhat rarer, but does occur.)

- Unambiguous vowel clusters, i.e. those in which neither vowel is high, are not well-attested.

- Unambiguous consonant clusters are also not well-attested in syllable onset position. (Many languages do permit nasal + C clusters across syllable boundaries.)

- In those languages in which a round and non-round vowel can be juxtaposed across a morpheme or word boundary, the first (round) vowel is often realized as a semivowel (or labialization on the preceding consonant, depending on one's analytical preference).

The unitary phoneme and CC cluster analysis are relatively concrete, in that the proposed underlying forms are virtually identical with the surface forms. There is in fact relatively little difference between these analyses, and it is not even clear that phonological theory should admit both possibilities, given that the two types of representations (single labialized segment vs. complex cluster) rarely if ever contrast within the same language. (In fact, some recent theories do not allow both possibilities.) In attempting to decide between these two analyses, the criteria which are most commonly invoked are phoneme inventory economy and the evidence from clear syllable patterns ("pattern pressure"). Inventory economy favors the CC cluster analysis, since this avoids positing additional phonemes. Pattern pressure on the other hand argues for the unitary phoneme analysis, since this avoids adding a new syllable type CCV(C) (assuming, as is generally the case, that the language lacks unambiguous CC clusters).

In my view neither of these considerations is very weighty. In the case of economy, there is very little evidence that languages disprefer large segment inventories or that considerations of economy play a significant role in the innate psychological principles that underlie sound systems. The argument against a /Cw/ analysis based on a lack of other CC clusters is also relatively weak. Languages tend to favor clusters in which the second C is more sonorous than the first C (Clements 1990). From this perspective, [Cw] and [Cj] clusters are ideal. Hence, it should not be

surprising for a language to have only these clusters and not others. (In general, languages tend not to tolerate segments and sequences which are phonetically non-optimal unless they also have segments and sequences which are more optimal. The converse is not true: it is common for languages to tolerate only entities which are in phonetically optimal in some identifiable sense.)

Since the primary arguments against both the /Cw/ and /Cw/ analyses are weak, and since there are usually not other considerations which would rule out either analysis, either of these analyses is usually quite defensible. Deciding between them is pretty much a toss-up, except in unusual cases like Chumburung, in which the fact that every consonant in the language has a phonemically labialized counterpart might render the economy argument more potent and swing the balance in favor of the /Cw/ analysis.

As far as the fourth ("syllable feature") analysis is concerned, it will not do to simply state that labialization is a feature of the syllable without giving some detailed explanation of what this means. For one thing, it seems to me that such a statement is only coherent if the phonetic location of labiality within the syllable is predictable. In fact, however, many (perhaps most) African languages with labialized consonants have a contrast for example between [Cu] and [Cwi], so that if labiality is really a feature of the syllable then one is entitled to ask why it is that it is realized on the vowel in the case of a word like [ku] but on the consonant in the case of a word like [kwi].

Remaining to be considered is the /CUV/ analysis, which has been employed for a large number of African languages. A fact that is relevant here is that many languages have cases in which phonetic labialization arises at a boundary between a morpheme (or word) that ends in a vowel and a following morpheme (or word) that begins with a vowel. In Nawuri, for example, when the second person singular pronoun [fʊ] ‘you’ comes before a word beginning with a non-round vowel, it surfaces as [fw], e.g. /fʊ+asa/ ‘your people’ is realized as [fwaːsa]. In this particular situation, a /CUV/ analysis is clearly the only reasonable possibility. Whether this justifies extending the analysis to morpheme-internal cases of labialization (e.g. to a Nawuri form like [fwaːla] ‘greet’, which is monomorphemic), is much less clear. At the very least, there are some significant objections which the analysis runs up against in such languages:

- It is abstract, in the technical sense that it entails posting underlying sequences which never show up on the surface.

Phonological theories differ as to how much they tolerate abstract analyses; however it should be noted that the /CUV/ analysis of labialization would be ruled out by a number of phonological principles that have been proposed over the years. More significantly, perhaps, virtually all theories since the early 70's are agreed that abstract analyses are only justified if they attain some significant advantage over more concrete analyses. I have claimed, however, that the possible drawbacks of the alternative, more concrete /Cw/ and /Cw/ analyses are quite minor. In comparison to the latter analysis, in fact, it is doubtful whether the /CUV/ analysis can claim any advantage to compensate for its abstractness. For while the /Cw/ analysis requires adding a novel syllable type, the /CUV/ analysis also requires adding a type of sequence (/VV/) that would not otherwise occur underlyingly.

- It gives rise to a curious gap in underlyingly patterns, in that the only VV sequences which exist underlyingly under this analysis are those in which the first vowel is /u/.

This criticism of the /CUV/ analysis is not intended to deny the fact that such sequences may well be the historical source of present-day labialized consonants in these languages. In fact, it is sometimes possible to find evidence that this is the case. The question however is whether or not native speakers are still aware of the original morphemic composition of the relevant words. Also, a possible point in favor of the /CUV/ analysis is that native speakers tend (in cases where they are not well-versed in some accepted orthographic tradition) to favor this kind of orthographic representation, e.g. they prefer to write [kwa] as kua. (I suspect, in fact, that this kind of native speaker preference has a lot to do with why the /CUV/ analysis has enjoyed the popularity it has.)

A final point that needs to be stressed in any case is that the question of whether or not to analyze [kwa] as /kua/ is not one of phonetic interpretation. There is (in principle at least, though there may be borderline cases in some languages) a clear phonetic difference between [kwa] and [kua], and I see no justification for re-transcribing something which sounds like [kwa] as [kua] . At most, it is possible to argue that [kwa] is phonemically /kua/.

7.5.3 Descriptive treatment

Many phonological descriptions have gone into considerable detail in weighing the relative merits of these analyses (or at least the first three--the fourth is often not discussed) in the language concerned. Despite this expenditure, the criteria considered rarely converge on a single clearly correct solution (as evidenced by the fact that in the cases where more than one team has worked on a language, the solutions adopted by each have often differed).

As an alternative to a detailed consideration and discussion of these different analytical possibilities, I suggest the following approach, which I believe should be adequate for most West African languages.

- Refer to the elements in question as "labialized consonants" in your description and list them as phonemes in your charts and elsewhere.

- Mention any alternative analysis that you think might be viable, for example:

"Alternatively, these labialized consonants might be analyzed as /Cw/ clusters..."

OR

"An alternative would be to derive these labialized consonants from underlying /Cu/ sequences..."

[Optional: briefly mention here any pros or cons, without going into detail. This should only take a few sentences at most.]

- To the extent that you have reservations about the single-segment analysis, qualify your descriptive statements accordingly, for example:

"Although other analyses cannot be ruled out, for purposes of this description I tentatively treat labialized consonants as unitary phonemes..." (Appropriate for fairly mild reservations.)

"Although I have tentatively treated the labialized consonants as unitary phonemes, it should be noted that other analyses are possible. In particular, an analysis in which ... deserves consideration / strong consideration in that .... for arguments in

favor of this type of analysis in .... [name of language], see ...[name of source]" (Appropriate for somewhat more serious reservations.)

Keep in mind that it is neither necessary nor possible for you to definitively settle the matter. The analysis of labialized consonants is something that people have always disagreed on and they will continue to do so. It is not even necessary for you to call attention to all the relevant arguments and evidence. After several decades of this sort of detailed discussion in African languages, people who are interested will have no trouble supplying the arguments themselves, as long as all the relevant facts are clearly stated somewhere in your description. (See below on *Interpretation.*)

Suggested reading:

Bendor-Samuel, John T., and Mona Perrin. 1971. A note on labialization in Mambila. In Actes du 8e Congrès de la Société Linguistique de L'Afrique Occidentale, 119-129. Abidjan: Université d'Abidjan.

Bendor-Samuel, P. M. 1965. Phonemic interpretation problems in some West African languages. Paper presented at the Fifth West African Languages Congress.

Olson, Kenneth S., and Brian E. Schrag. 1998? An overview of Mono phonology. MS. (See section on labialized consonants.)

Look also at various descriptions in the Collected Language Notes series produced in Ghana.

7.6 Vowel sequences

Most West African languages have at least some VV sequences in which the two vowels are different. Very commonly, the first vowel is high and the second non-high, e.g. [ua], [ie], etc. One of the first things to do is to establish some basic facts:

- Which vowel sequences occur?

In particular, it is very important to establish whether "unambiguous" sequences occur, i.e. sequences like [ɛa], [aɔ] in which neither vowel is high, since in the absence of these sequences, ambiguous sequences like [ua], [ai] etc. could (and

probably should) be reinterpreted as [uwa] and [aji]. (In most Kwa and Gur languages, these unambiguous vowel sequences do not occur.)

- Is there a phonetic contrast between [uwV] and [uV], e.g. does [kua] contrast with [kuwa]?

Although there is no necessary phonetic difference between [kua] and [kuwa] in any given languages, it is possible for a language to contrast the two by making the [w] in [kuwa] with greater constriction than is typical of [u]. If the two types of sequences contrast, then of course they must be analyzed differently, hence there is no possibility of interpreting (the genuine) [ua] as [uwa]. It is unusual for these sequences to contrast in West African languages however.

- Are there vowel sequences that arise across morpheme boundaries?

For example, a language might have a root which regularly surfaces as [ku], and a suffix which is regularly [a], which combine to form [kua]. Assuming that the suffix is known to be [a] rather than [wa] (by the fact that it surfaces as [a] after consonant-final roots), we must apparently conclude that we are dealing with /u + a/ rather than /u + wa/.

- Is there a phonetic contrast between [CwV] and [CuV], e.g. between [kwa] and [kua] (which might be also [kuwa])?

In many African languages there is. The significance of this is that if the two sequences contrast then they must have different underlying sources: it is not possible to analyze both [kwa] and [kua] as /kua/. (I fear that this may in fact have been done in the analysis of some West African languages). Thus, either [kwa] must be /kwa/ (or /k^{w}a/), or [kua] must be /kuwa/ (or both). Furthermore, in the unlikely event that there is a three-way phonetic contrast between [kwa], [kua], and [kuwa], then these must be analyzed respectively as /kwa/ (or /k^{w}a/), /kua/, and /kuwa/.

In the very common case in which there are no unambiguous vowels sequences and no contrast between [kua] and [kuwa], it is difficult not to reinterpret [kua] as [kuwa], given the facts that (1) there is no necessary (cross-linguistically invariant) phonetic difference between the two, and (2) if [kua] is interpreted as [kua] (and

/kua/), then the fact that the only vowel sequences which occur are precisely those in which an intervening semivowel could not be ruled out on purely phonetic grounds is an unexplained coincidence.

In cases where the relevant criteria do not clearly converge on either the VV or VwV (or, in the case of sequences involving high front vowels, VjV) analysis, I suggest trying the following informal psycholinguistic test:

- Train native speakers to play a game that involves reversing the "halves" (syllables) of unambiguous CVCV words, e.g. a word [kata] would come out as [taka]. (This should be done orally rather than using written representations of words.) .

- Once a native speaker can carry out this task reliably every time, see what they prefer to do with words like [kua], [tie], etc. Do these come out as [aku] and [eti], or as [waku] and [jeti]? (Here again, do this orally, referring to words by glosses if necessary.)

If native speakers consistently favor one possibility or the other, this may be a valuable clue to the analysis of these sequences.

In some languages, sequences like [ie] and [uo] can be analyzed as the phonetic realization of underlying long mid vowels /ee/ and /oo/. (This assumes of course that there is no contrast between [ie] and [ee], [uo] and [oo].)

A final note: The existence of long vowels in a language should not be used as an argument, even a weak one, for analyzing something like [ua] as a vowel sequence. Long vowels are fundamentally different from genuine vowels sequences in certain important respects. As far as I am aware, there is no correlation cross-linguistically between the presence of long vowels and the presence of (unambiguous) vowel sequences. For parallel reasons, the existence of word-initial V syllables in a language has absolutely no bearing on the analysis of word-internal VV sequences. There are hundreds of languages in Africa which have word-initial V sequences, but lack (unambiguous) word-initial VV sequences entirely, nor is there any indication as far as I know that languages which permit word-initial V syllables show any more or less tolerance for word-internal VV sequences than those which do not.

7.7 Vowel harmony

See Casali (2003).

7.8 Tone (a brief suggestion only)

Be aware that some two-tone African languages have, in addition to a high-to-low falling contour tone, a contour which falls from high to downstepped high (i.e. the degree of the fall is not as great as the H-L contour). In some languages, these H-!H contours can occur even on short vowels.

References

Casali, Roderic F. 1990. Contextual labialization in Nawuri. Studies in African Linguistics 21:319-346.

Casali, Roderic F. 1995. Nawuri Phonology. (Language Monographs no. 3.) Legon: Institute of African Studies, University of Ghana.

Casali, Roderic F. 2003. An introduction to ATR vowel harmony in African languages. MS, SIL.

Kuch, L. D. 1993. The phonology of Birifor. (Collected language notes, 21.) Legon: Institute of African Studies, University of Ghana.

Price, Norman. l975. Collected field reports on the phonology of Nchimburu. (Collected language notes, l4.) Legon: Institute of African Studies, University of Ghana.

Snider, Keith L. l984. Vowel harmony and the consonant l in Chumburung. Studies in African Linguistics 15:47-57.

Snider, Keith L. l989. North Guang Comparative word list: Chumburung, Krachi, Nawuri, Gichode, Gonja. (Comparative African Wordlists, 4.) Legon: Institute of African Studies, University of Ghana.

Appendix - Swadesh 200 Word List

1. me

2. you

3. we

4. this

5. that

6. who

7. what

8. not

9. all

10. many

11. one

12. two

13. (be) big

14. (be) long

15. (be) small

16. woman

17. man

18. person

19. fish

20. bird

21. dog

22. louse

23. tree

24. seed

25. leaf

26. root

27. bark

28. skin

29. flesh

30. blood

31. bone

32. oil / grease

33. egg

34. horn

35. tail

36. feather

37. hair

38. head

39. ear

40. eye

41. nose

42. mouth

43. tooth

44. tongue

45. claw

46. leg

47. knee

48. hand

49. belly

50. neck

51. breast

52. heart

53. liver

54. drink

55. eat

56. bite

57. see

58. hear

59. know

60. sleep

61. die

62. kill

63. swim

64. fly

65. walk

66. come

67. lie down

68. sit

69. stand

70. give

71. say

72. sun

73. moon

74. star

75. water

76. rain

77. stone

78. sand

79. earth

80. cloud

81. smoke

82. fire

83. ash

84. burn

85. path

86. mountain

87. (be) red

88. (be) green

89. (be) yellow

90. (be) white

91. (be) black

92. night

93. (be) hot

94. (be) cold

95. (be) full

96. new

97. (be) good

98. (be) round

99. (be) dry

100. name

101. ye

102. he/she

103. they

104. how?

105. when?

106. where?

107. here

108. there

109. other

110. three

111. four

112. five

113. few

114. sky

115. day

116. fog

117. wind

118. flow

119. sea

120. lake

121. to rain

122. (be) wet

123. wash

124. snake

125. worm

126. back

127. leg

128. arm

129. wing

130. lip

131. fur

132. navel

133. guts

134. saliva

135. milk

136. fruit

137. flower

138. grass

139. with

140. in

141. at

142. if

143. mother

144. father

145. husband

146. wife

147. salt

148. ice

149. snow

150. freeze

151. child

152. (be) dark

153. cut

154. (be) wide

155. (be) narrow

156. (be) far

157. (be) near

158. (be) thick

159. (be) thin

160. (be) short

161. (be) heavy

162. (be) dull

163. (be) sharp

164. (be) dirty

165. (be) bad

166. (be) rotten

167. (be) smooth

168. (be) straight

169. (be) correct / true

170. left

171. right

172. (be) old

173. rub

174. pull

175. push

176. throw

177. hit

178. split

179. pierce

180. dig

181. tie

182. sew

183. fall

184. swell

185. think

186. sing

187. smell

188. vomit

189. suck

190. blow

191. fear

192. squeeze

193. hold

194. down

195. up

196. (be) ripe

197. dust

198. (be) alive

199. rope

200. year