

## **Phonetic Theory — Course Project and Lab Assignments**

prepared for Linguistics 600.01, Ohio State University by

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A large part of the coursework consists of a small field project and a set of 10 lab assignments. The field project is intended as a practicum for using traditional methods of observation in fieldwork in conjunction with the instrumental methods introduced in this class. There are five field project reports, described in general terms in Section 4 of this document. (Instructions specific to each report are given as stand-alone html files linked into the course web page.) Many of these reports incorporate the results of the concurrent lab assignments. The general design of the lab assignments is described in Section 5 of this document. (Instructions specific to each lab are given as stand-alone html files linked into the course web page.)

### **0. Hardware and software**

For most of the lab assignments, you will need to prepare recordings to be analyzed in the lab session. Often these recordings will be of materials elicited from your language consultant in the fieldwork sessions. Also, for all but the first of the course field project reports you will be asked to provide acoustic records (such as annotated spectrograms) to supplement the alphabetic record of your auditory and visual observations. And for the last field project report, you will be asked to turn in the full set of audio files that you recorded on a CD or other electronic medium, as a summary archive of the entire project. This audio archive will serve in lieu of any summary written description of the language. To create these acoustic records, you will need to be able to make a good clean audio recording, and have access to appropriate acoustic analysis software.

To make a good audio recording, you need a quiet place to record and a reasonably good microphone. If you do not own a good microphone, and do not have access to a good microphone in your advisor's laboratory or the like, you can arrange with the instructor to check out one for you each week to use in Oxley room 6. However, you should first find out your consultant's weekly schedule, to make sure that your consultant will be available to record at a particular time each week.

If you have a personal computer of your own with a good quality sound card, you can make the recordings directly to your hard drive. Alternatively, if you have a good quality stand-alone recording device, such as a digital audio tape (DAT) recorder, flash card recorder, or the like, you can use that device to make the recording and then transfer the materials that you want to analyze to a computer file. You can do this by digitizing from an analog audio tape recording or by doing a direct digital-to-digital transfer. If you do not have your own personal computer or a recording device such as a flash card recorder, you can arrange with the instructor to record to a computer file using the computer that sits next to the double-walled sound booth in Oxley room 6, and then transferring this file to a CD or thumb drive. Again, though, you should first arrange for a set of possible times when your language consultant would be available to come to Oxley Hall.

If you have a personal computer of your own and do not already have some acoustic analysis system loaded on it that you prefer to use, download Praat from <http://praat.org>. Do this as soon as you can, because you will need these analysis capabilities to be working on the first take-home lab exercise during the second week of the course. (The writeup for this exercise is due by 1:00 on the Friday before the first class meeting of Week 2 if you want feedback, and otherwise at the beginning of that class meeting.) If you are having trouble downloading the software and setting it up, let us know right away, so that we can help you.

If you do not have a personal computer, you will need to figure out how to use Praat on a regular basis. For example, you may be able to arrange to install Praat on a computer in your advisor's lab that you can use regularly to do your coursework for this class. In the worst case, you can put Praat on a thumb drive or CD or external hard drive, to use in a public computer lab.

### **1. Finding a language consultant.**

The first field project report is a description of your project language and language consultant. Before you can write this report, you need to find a language consultant with whom you will work throughout the quarter. Here are some characteristics of the ideal language consultant. He or she:

- is a native speaker of a language that you don't know. (By "native speaker" we mean someone who learned the language as a young child and still actively uses the language in everyday life.)
- is willing to work with you at least one or two hours per week throughout the quarter.
- is willing to let you record his or her speech.
- is interested in, and maybe even proud of, his or her language and will want you to get it right.
- is patient and willing to repeat the same word or phrase over and over while you try to learn to pronounce it.

One approach to finding a language consultant is to pick a language that you are interested in and seek a speaker of that language. Some ways to find a speaker of a particular language include:

- check for student clubs, grocery stores, or churches in Columbus in the phone book or among computer discussion groups.
- post a flyer in the graduate student dorms and in the community center of the student families' apartment complex in Buckeye Village.
- use word-of-mouth advertising with class-mates, friends and family.

A second approach is to check among your classmates, friends, and family for a potential consultant, regardless of what particular language they speak. If you speak a language other than English as a native language, you might make an exchange with a classmate who speaks a different language other than English. Or, if you speak only English natively, and write well, you might arrange with a classmate who does not speak English natively, to exchange weekly proof-reading/editing for language consulting sessions. This approach is especially appropriate if you want to learn how to do fieldwork on your own, eliciting forms one-on-one, but have no special interests in one particular language or language group.

☞ If you choose this approach, note that many people command more than one language natively. In such cases, you probably will find it more rewarding to ask the person to work with you on a description of the least well-studied language. (Your fieldwork might even lead to a paper that becomes a valuable supplement to the paucity of published research books and articles on the language.) However, first make sure that the speaker did learn the language as a child and has continued to use it. For example, a person from Taiwan may speak both Taiwanese and Standard (i.e. "Mandarin") Chinese as native languages. Unless the person stopped using Taiwanese after learning to read and write Mandarin, choose Taiwanese as the less studied language of the two.

A third approach is to work with one of the language consultants that the instructor will identify. That is, the instructor will arrange with one or two members of the OSU linguistics community to act as "default" language consultants, to work with students in groups of two or three. (If you are a native speaker of some language other than English and would like to act as a default language consultant — e.g., as a way to recruit classmates to work on your language —

please let us know right away.) You can choose this option if you do not have a clear preference for working on a particular language or language family and if you are willing to learn to work in a group elicitation situation where you cannot have the sole attention of the language consultant. (This is a good skill to acquire in any case, if you are planning to take Ling. 650, by the way.)

## 2. Finding useful information about the language

In order to interpret some of your consultant's comments and metalinguistic behavior, you will want to find out basic background information, such as the language contact situation. Also, to make maximum use of your consultant's time in elicitation session, you probably will want to glean as many suggestions as you can readily from the literature about vowel and consonant contrasts and prosodic phenomena to look for in your consultant's speech (see point 8 in Section 3). For either sort of information, the following references are invaluable:

- Grimes (1992) *Ethnologue* [P123.G73 1992] Also available at <http://www.sil.org/ethnologue>
- Voegelin & Voegelin (1977) *Classification and Index of the World's Languages* [P203.V6]
- *The Encyclopedia of language and linguistics* [P29 .E48 1994]
- *International encyclopedia of linguistics* [P29 .I58 1992]
- *The Cambridge encyclopedia of language* [P29 .C64 1997]
- Louw (1996) *The Atlas of Languages* [P106 .L77 1996]
- IPA (1999). *Handbook of the International Phonetic Association*. [P227.I45 1999]
- Maddieson (1984) *Patterns of Sound* [P217.M238]
- Ladefoged & Maddieson, *The Sounds of the World's Languages* [P221.L274]
- Ladefoged (1993) *A Course in Phonetics*, 3rd Ed. [P221.L25]
- Pullum & Ladusaw (1996) *Phonetic Symbol Guide*, 2nd Ed. [P221.P85]

Some of these references will not actually give you the information that you are looking for, but they will list grammars and language descriptions (including articles in linguistics journals) which you can consult.

To find information on the phonetics of a language you can also look for articles in phonetics journals. Here is a list of some: *Journal of Phonetics*, *Phonetica*, *Language and Speech*, *Journal of the IPA*. Also there are journals devoted to specific language groups such as: *International Journal of American Linguistics* (American Indian languages), *Journal of African Linguistics*, *Journal of East Asian Languages*. To find relevant articles in these journals you can use the *MLA International Bibliography* or other research databases that are available through the OSU library.

☞ When using published sources such as those described here, keep in mind that language descriptions are often based on the speech of only a few speakers (sometimes only one speaker!), and given that all languages have many different varieties based on regional, social, or even just idiosyncratic differences, the variety of the language spoken by your consultant will inevitably be at least somewhat different (and possibly very different) from the variety described in any published study. Use the published source as a guide to what to try to elicit, but trust your own powers of observation if you hear or see something different from what is described in the published source. For example, if you were working on English and your language consultant was from Melbourne, Australia, the following list of words:

*had, hod, hawed, head, heard, hayed, hid, heed, hoed, HUD, who'd*

which was used to elicit the vowels for the database of Detroit, MI, dialect vowels that is available at <http://homepages.wmich.edu/~hillenbr/voweldata.html>, would not be adequate for

preparing for the field project report on the vowel contrasts, since it would not differentiate the short [a] in *hod* from the long [a:] in *hard* in this dialect:

### 3. Working with a language consultant.

The following hints are adapted and expanded by Mary Beckman and Keith Johnson from notes originally distributed by John Ohala to students in Ling 110 (Introduction to Phonetics and Phonology) at the University of California, Berkeley, in 1977.

1. Set up a time for weekly meetings with your consultant. Many of the in-class lab assignments require preparation in elicitation sessions, and all of the project reports require this, so it is crucial that you meet with your consultant each week. Unless your consultant is offended by the suggestion (e.g., if he or she agreed to collaborate with you as a point of pride in his or her language), it is a good idea to set up a regular reciprocal exchange whereby you provide, say, a ride to the grocery store or babysitting (if your consultant is a young parent who does not own a car), or English practice or proof-reading every week in return for the consulting session.
  2. Exchange phone numbers with the consultant. You and your consultant need to be able to get in contact with each other, to reschedule meetings if time conflicts arise, etc.
  3. Record your phonetic transcriptions in a notebook, preferably a bound notebook, with numbered pages, and date all material for easy reference later. Always write down the English glosses (translations) of the words you write in phonetic transcription. Don't erase apparent mistakes. Instead, strike out lightly and write the correction above. It may turn out that you were right the first time, and the speaker vacillates between two pronunciations. Use consistent symbols, preferably from the International Phonetic Alphabet. (See section 8 for the complete IPA chart, downloaded from the web page maintained by the Secretariat of the International Phonetic Association.)
  4. You may want to start by eliciting tool phrases such as words for greetings, 'Thank you', 'How do you say \_\_\_\_?', etc.
  5. Elicit common words such as those listed in Samarin's 200-word list (reproduced in Section 6 below). Abstract words and very culture-specific concepts probably will have no simple one-word translations.
  6. Immediately after each session review your notes. Have you run across any consonants or vowels that didn't occur in previous sessions? Was the speaker unsure about any of the pronunciations? Are you unsure about any of the transcriptions? What should you not forget to ask about in the next session? A short self-debriefing session like this after each meeting with your consultant will help you use your limited elicitation time effectively.
- ☞ Note that this kind of review, in conjunction with the search for minimal pairs and so on (see points 7 and 8 below), is an essential component of the preparation for any of the in-class lab assignments associated with a field project report. You may want to structure your elicitation sessions accordingly. Keep a written record of this debriefing, either directly on a page in your field notebook, or as a separate sheet that you can staple into your field notebook (see the description of the stages of preparation for the project-related lab assignments in Section 5 below).
7. Try exploratory elicitations, where you present a hypothetical form like one you've already elicited or that was mentioned in a published description and ask if it exists — e.g., 'You have a word [fa:s], is there a word [va:s]?' This is a good way to find minimal pairs and sets.
  8. Also, scour the literature for examples of minimal pairs and sets. In searching for such example words in your language you may find the published research on the language to be very helpful, but you should **never** simply reproduce a minimal set that you find in a reference. Rather, you should elicit the words from your consultant and report your own

transcriptions of his or her speech, which may be substantially different from the pronunciations reported in a source. One strategy that we recommend is to take down the glosses of a minimal set from your source and elicit those words from the speaker. Then after the session you can compare your transcriptions with the transcriptions listed in the source.

9. Always imitate words as accurately as possible until the consultant is satisfied that you are reproducing the form correctly.
10. Record your consultant's pronunciations as an aid to your memory and for discussion in class. (To prepare for most of the lab sessions, and to make the acoustic displays required in most of the project reports, you will need to record one or more tokens of all relevant examples, and we will ask you to give us a CD as part of your last project report — see description of Report 5 on the course web page.) To make a good quality recording, you will need to have the microphone close to the consultant's mouth without directly blowing on it and you will need to be in a quiet room. If you have a good quality tape recorder and a good lapel mic or head-mounted mic, and your consultant feels natural wearing the mic the whole time, you could record the whole session, for later playing. Another strategy is to spend 20-25 minutes eliciting words and then in the last part of the session to make a very clear recording of all the words covered in that session. Preface each recording session with a spoken "label" in which you state the date of the recording session and/or the relevant pages in your field notebook.
- ☞ Also add the lab assignment or field project report number to which the recording session is keyed, if you are making the recording to hand in with a lab assignment or project reports.
11. As you get further into the quarter and become comfortable using Praat, you may want to start making an annotated database of the recordings, by designing a TextGrid format that you can use to transcribe the recordings and make notes. Design the TextGrid so that it's easy for you to search it for examples later on.

#### **4. The field project reports**

These should be as short as you can make them and still get in all the information you want to report. These can be prepared as a LaTeX file or in a word processor program such as StarOffice if you know you can insert symbols easily using an IPA font. Or they can be created as an html file using the codes for symbols at <http://www.phon.ucl.ac.uk/home/wells/ipa-unicode.html> and then printed out to paper or a pdf file. The class web page has links to an IPA font cheat sheet for LaTeX and to John Well's page of html codes for IPA symbols. If you have your own personal computer running Windows or MacOS, you can download a set of free IPA fonts from <http://www.sil.org> or you can use a Unicode font that includes IPA symbols. None of the reports, with the exception of Report 1, should be produced on a typewriter or on a computer platform without such an IPA font, since it takes far too long to type the report and then go back to make sure that you have written in all the symbols. More specific descriptions of what should go into each report are provided in separate files linked into the course web page.

See section 7 of this document for the IPA chart and section 6 for a word list that you might find useful in preparing the field project report on typical word shapes in the language.

#### **5. The lab assignments**

If you examine the schedule of project report topics, you will see that each of them other than the first is more or less closely related to concepts and phenomena that will have just been covered in the readings from Johnson (2011) and the discussion in class of the topic being covered during the weeks just before the report is due. And even the first report includes a section that is linked to concepts covered in Chapter 2 of Johnson (2011). Many of the in-class lab assignments are

designed to help you take maximum advantage of this relationship. Unless otherwise specified in the instructions for a particular lab, preparation for each lab session consists of two stages, the first of which was already hinted at above (see the note with a pointing hand icon at the end of Section 3).

First, review the reading and discussion in class related to the topic of the lab and try to develop a practical understanding of the material covered, both in general and in terms of your field project language. Often, getting the requisite practical understanding of what the material means for your language will require that you schedule one or two elicitation sessions in which you intentionally focus on eliciting examples illustrating particular types of contrasts.

Second, write down the most pressing questions from the first stage, and choose the top two or three of these questions to bring to class. Choose examples of words or utterances or whatever that you will need to examine these questions, and prepare a recording of productions of these examples.

For example, in preparation for the lab assignment on the field project language's vowel space, schedule two or three elicitation sessions during which you concentrate on eliciting the full set of vowel contrasts from your language consultant. (You will need to do this to prepare field project report on vowels, in any case.) After reviewing your notes for these elicitation sessions, gather up outstanding puzzles, and try to formulate them as questions that might be answered in terms of the alternative representations and observational methods described in Chapters 4 & 6 of Johnson — questions such as “Does the vowel in the word for ‘you (sg.)’ have a higher F2 than the vowel in the word ‘all’ in this language, or does it just have an [i]-like onglide?” Bring to class for the lab session a list of the top two or three most pressing of these problems, along with lists of words illustrating each problem, and a set of digitized audio files extracted from a recording of these word lists produced by your consultant.

In preparation for the lab on fricatives, similarly, you would schedule elicitation sessions in which you try to find words that contrast fricatives in the same position in the word and in the same vowel context. In preparing for the lab on fricatives, then, you might focus on understanding the difference between two fricatives that seem to differentiate two words for your consultant, but which you can't seem to differentiate auditorily. If you can get the consultant to characterize the gestures that he or she is using to make this difference, you can then pose questions about what aspects of the spectral pattern are relevant to look.

The first part of the assignment proper, then, is the brief (try to make it less than half a page) summary listing these questions and the relevant corpus materials. Organize the list of relevant corpus materials into a table or in some other way that is an efficient representation of the contrast. Bring two copies of this initial writeup, one to turn in to the instructor and the other to keep by you as you make notes during the lab session of any observations that are pertinent to your questions. (The copy you keep can be the original, written down directly as a page in your field notebook, from which you make a Xerographic copy for the instructors. If you choose this method, please write as neatly as you can, so that the questions and lists are legible to someone not familiar with your handwriting.)

The second part of the assignment is a synopsis of what you learned in the lab session, with accompanying figures as appropriate. For example, if you asked the question described above about the difference between the vowels in the forms for ‘you (sg)’ versus ‘all’, you might include an annotated spectrogram of a token of each of these two words, along with a short statement of any conclusion you made based on the spectrograms. This second part should be included as an appendix to whatever report is listed in the “writeup due” column of the weekly schedule of readings and assignments table on the syllabus. For example, the writeup of the lab about vowels would be an appendix to the field project report on the language's vowel space.

**6. Word list** — from Samarin, William T. (1967) *Field Linguistics*. Holt, Rinehart & Winston.

|          |            |           |            |           |          |        |
|----------|------------|-----------|------------|-----------|----------|--------|
| all      | dig        | give      | lie        | rightside | squeeze  | warm   |
| and      | dirty      | good      | live       | river     | stab/    | wash   |
| animal   | dog        | grass     | liver      | road      | pierce   | water  |
| ashes    | drink      | green     | long       | root      | stand    | we     |
| at       | dry        | guts      | louse      | rope      | star     | wet    |
| —        | dull       | —         | —          | rotten    | stick    | what?  |
| back     | dust       | hair      | man/male   | rub       | stone    | when?  |
| bad      | —          | hand      | many       | —         | straight | where? |
| bark     | ear        | he        | meat/flesh | salt      | suck     | white  |
| because  | earth      | head      | moon       | sand      | sun      | who?   |
| belly    | eat        | hear      | mother     | say       | swell    | wide   |
| big      | egg        | heart     | mountain   | scratch   | swim     | wife   |
| bird     | eight      | heavy     | mouth      | sea       | —        | wind   |
| bite     | eye        | here      | —          | see       | tail     | wing   |
| black    | —          | hit       | name       | seed      | ten      | wipe   |
| blood    | fall       | hold/take | narrow     | seven     | that     | with   |
| blow     | far        | horn      | near       | sew       | there    | woman  |
| bone     | fat/grease | how       | neck       | sharp     | they     | woods  |
| breast   | father     | hundred   | new        | shoot     | thick    | work   |
| breathe  | fear       | hunt      | night      | short     | thin     | worm   |
| brother  | feather    | husband   | nose       | sing      | think    | —      |
| burn     | few        | —         | not        | sister    | this     | ye     |
| —        | fight      | I         | spit       | sit       | thou     | year   |
| child    | fire       | ice       | old        | skin      | three    | yellow |
| clothing | fish       | if        | one        | sky       | throw    |        |
| cloud    | five       | in        | other      | sleep     | tie      |        |
| claw     | float      | —         | —          | small     | tongue   |        |
| cold     | flow       | kill      | person     | smell     | tooth    |        |
| come     | flower     | knee      | play       | smoke     | tree     |        |
| cook     | fog        | know      | pull       | smooth    | turn     |        |
| count    | foot       | —         | push       | snake     | twenty   |        |
| cut      | four       | lake      | —          | snow      | two      |        |
| —        | freeze     | laugh     | rain       | some      | —        |        |
| dance    | fruit      | leaf      | red        | spear     | vomit    |        |
| day      | full       | leftside  | right/     | —         | —        |        |
| die      | —          | leg       | correct    | split     | walk     |        |

