6) **Perform measurements and analyses.** Many analyses will make use of spectral analysis software, often the software in the Phonetics Lab. The exact nature of the analysis will depend, of course, on the topic. Things that are relatively straightforward to measure are durations of events, formant frequencies of vowels and sonorants (except nasals, which present their own sets of problems), and fundamental frequency in sonorants. Other very doable possibilities, such as change in fundamental frequency or the relative timing of various events also can be done quite easily.

Once the measurements have been done, it should be straightforward to provide part of the answer to your original questions.

You will have already specified your estimate of the analyses to be performed in the prospectus; however, guessing ahead of time and actually working with real signals can be two very different things. To help us through these hazards, you should email (or hand a hardcopy of) the **Measurement and Analysis Scheme** to us as soon as you have the data and have had a chance to attempt to do analyses. This had better be **before** April 7.

**Measurement and Analysis Scheme** = images and explanatory text indicating what measurements are to be drawn from the original data, *with it worked out on a particular example from the data itself*.

The scheme should include four items.

a) A short narrative of how you go about extracting measurements from the recordings of subject behavior, with enough detail for us to know that you have actually attempted it and succeeded in getting the appropriate data. Before finishing this, you should do a sample of measurements with the various speakers and conditions you are examining, to make sure that you have an idea that this will actually work for most of your data.

b) Any questions which arise in the process of figuring out how to measure items, so that we can address them.

c) A print out of a (very) small number of representations of utterances that have the relevant information indicated on them. The exact form of the representations will depend on the project.

d) Finally, tell us what the exact data that arise from the measurement scheme will be.

Particular examples are given below.

1) Suppose that you have a project that measures vowel quality and duration. You should give us a document specifying how the two types of measurements are to be done. For
example, for vowel quality, you have to determine where in the vowel you are measuring, so give an example of a marked up spectrogram or waveform indicating the time of various measures. Then, at that time, if you use a formant extraction algorithm, you should indicate the settings used for the extraction algorithm, e.g. by printing out the dialogue box where the settings are entered. For vowel duration, indicate what visual display you will use (probably combination of broadband spectrograms and waveforms), along with marked up examples. This example will produce F1, F2, and F3 estimates at times X & Y (indicated on the spectrogram), as well as the time of release going into the vowel, and closure coming out of the vowel.

2) Suppose you are doing more of a typological classification of types of rhotics in language X that appear in different linguistic contexts. Here, you must include a list of the types that you will be classifying utterances into, along with a narrative as to how you know what class they belong in. Include example spectrograms of each type, with any quantitative information that you might get on the different types. Resulting data here are the number of instances of particular types for each speaker in various contexts, along with measurements of duration of items in types c – f (or something like that).

3) Projects may involve perceptual identification. If this is the case, then indicate in your narrative what the stimuli are, and what the exact task is. For example, if you have a continuum of different durations in a quantity comparison study, state how many continua you have, and how many steps there are in the continua. Then, if the task is identification, indicate what the data look like (e.g. with an example response form or output of an electronic form), and tell how you get from those responses to analyzable data. In this case, the process would probably be simply calculating proportion of responses for each stimulus, and the resulting data would be the percentage of times that each stimulus is identified as X or Y.