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On the bases of experimental phonology

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Although the process of scientific discovery is not fully understood, there are two aspects of it that are important. One involves such activities as theorizing, gaining insights, speculating, using intuition, and extrapolating. This part can be called 'extension' (in the sense of adding to current ideas). The other aspect involves collecting data, noticing patterns, identifying processes, and exhaustively describing given phenomena. This can be called 'consolidation' (in the sense of filling in the gaps in what is known). While linguists are always engaged in both types of activities (with different focus during different eras), within generative work there has been special emphasis on 'extension', on formulating theory and using intuition; indeed, this emphasis has been one of the attractions of generative grammar. Complementary to this emphasis on extension there has been developing an increased interest in 'consolidation', in doing field work and conducting phonological experiments, for example. My purpose here is to discuss experimental phonology as a consolidative activity, and to show how the consolidative function of experiments puts special requirements on the way they are run. A secondary purpose is to place consolidative work within a moderately general framework.

Part of the growing interest in consolidation may stem from the current wide gap between what is well known and what is theorized about. A strategy for reducing this gap is to make the level of theorizing more concrete, that is, to lower the plane of speculation or insight so that it is closer to the plane of what is known. Superficially it may seem that this strategy produces a purer form of truth, since the theory is brought closer to the data, and made more empirical. Making the theory more concrete and testing it more fully does lead to greater certainty about the validity of the theory (i.e. leads to consolidation of the theory). But it does so by neglecting extension into new areas of insight, where useful progress may be made. Since the ultimate goal of linguistics is not merely to understand everything about what is currently envisioned, but rather ultimately to understand everything about language, some expansion beyond current ideas is necessary. Making theory (extension) more concrete is therefore a temporary solution to a temporary problem.¹

Given some framework in which to place consolidative work, and the claim that experimentation is a part of consolidation, what can we say about the experiment as a consolidative activity? A general observation is that the nature

[1] Many of the ideas in this paragraph were suggested to me by Robert Harms.

of experimentation naturally leads the investigator into consolidative, empirical work. For one thing experiments are concretely oriented, in that they deal directly with the collection and manipulation of data. For another, an experiment can be repeated with various modifications to collect additional data of various kinds. Finally, by changing the stimuli or test conditions in an experiment it is possible to investigate carefully and precisely specific patterns or processes. An experiment, then, is a strongly empirical instrument.

Since experimenters engage largely in consolidative work, from the discussion in the second paragraph we might expect them to have a more concrete view of linguistic phenomena. This is in fact the case. For example, Hsieh (1970, 1975) argues for the inclusion of surface forms in the lexicon; Ohala (1973) proposes analogical rules that operate on surface forms; Steinberg & Krohn (1975) argue for a less abstract representation of English vowel shift. In addition, experimenters have been challenging simplifying assumptions about the kinds of generalizations that speakers draw, such as that the generalizations are discrete. Examples of experiments on nondiscrete generalizations are Ohala (1973) on analogy, and Hsieh (1975) on the role of association.

If an experiment is part of consolidative work, then its conclusions should be established as clearly and firmly as possible. If a process is to be demonstrated or a claim is to be supported, then the demonstration or support should be clear and direct, with a minimum of controversial or questionable assumptions. Unfortunately, this requirement is not always met. For example, Hsieh (1970, 1975) argues that surface forms need to be listed in the lexicon. In the first paper the conclusion is said to be supported by experimental evidence – it should be noted, though, that the evidence does not eliminate any of the more plausible alternatives to the conclusion, and is not ‘supportive’ in any strong sense; in the second paper the crucial part of the argument is an abstract discussion of language acquisition, which is completely independent of the experimentation. Ohala (1973) discusses aspects of ‘analogical phonological rules’ without demonstrating clearly that such rules exist. Steinberg & Krohn (1975) test the productivity of trisyllabic vowel laxing in English and then try to use the results to argue against the validity of the separate process of vowel shift.

Another area where the consolidative function needs to be tightened is the treatment of unknowns in the experiment. Two are cited here from my own work (see Nessly 1974). One unknown is the effect of the formality of the testing situation on speakers’ responses to test items. Does the formality induce responses different from the speaker’s most natural, spontaneous reaction; if so, how extensive is the influence? Another unknown is the circumstances under which speakers associate a given test item with another known word in the lexicon. Suppose, for example, that the experimenter wants to investigate the stress in words ending in *-acter* and uses the test item *thracter*. Suppose also that all the responses are *thdracter*. It is possible that the speakers modeled the

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pronunciation after the specific form *character*, and did not treat the test item *thracter* as a random word in *-acter*. Uncertainties in interpreting results are antithetical to the experimental goal of establishing (near-)certainty. The remedy appropriate to experimentation (as consolidative work) is not to leave such influences unknown but to investigate them and determine their nature and effects.

Within concrete, empirical work, the main goal is to establish facts. Not only does this goal help us understand more about concrete aspects of language, but it also helps guide theorists in fruitful directions, as when Brahe's careful measurements of planetary motion enabled Kepler to formulate correct laws about that motion. Once experimentalists start running their experiments as carefully and rigorously as possible, the inherent empirical goals of experimentation will be more easily reached.²

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[2] I would like to thank Robert Harms and Royal Skousen for their helpful comments.