

Hall
Ling 503
Spring 2006

A Guide to Problem Solving

1. Identify the problem. In phonology, this generally amounts to: “what are the underlying forms of each morpheme?” and “how do I get the surface forms from the underlying forms?”
2. Try to get a rough idea of the morphological structure of the data. (This may be subject to change, as you gather more data.)
3. Identify all alternations in the data. Figure out what type of alternation each one is (e.g., voicing, nasality, place of articulation, etc.).
4. Pick one of your types of alternations. Think about what your options are for it. For example, if you have an alternation between high and low vowels, either you could have a high vowel underlyingly that becomes a low vowel in some contexts, or you could have a low vowel underlyingly that becomes a high vowel in some contexts.
5. Identify the contexts in which each variant occurs.
6. Write possible rules for each of the choices you came up with in (4). If one of the rules is impossible to write, then you know that the other rule must be the right way to go. If both are possible, continue on to step (7).
7. Check your rule(s) to see if what they say is in fact TRUE of all the data forms. If not, if it is impossible to tweak one of them to make it work, then the other one must be true. If neither is true, try tweaking them in order to make them work. You can generally tweak rules in two places: 1. by changing what the rule applies to (A) or 2. by changing the environment in which it applies (C and D). If both can be tweaked in order to make them work, perhaps it is actually impossible to differentiate between them for a given dataset. Think about what kind of word you would need in order to differentiate them or to pick one over the other. Also, think about the naturalness or abstractness or elegance of the rules: is one far more elegant than the other? If so, you may be justified in picking it.
8. Repeat steps 4-7 for every alternation in the dataset, until you have a list of rules.
9. Check to see if any of your rules interact with each other. If they do, figure out what order they need to apply in. You can do both of these things by choosing underlying forms in which two or more rules could potentially apply, and then applying the rules in various orders (i.e., do sample derivations). If a derivation yields the wrong result, you know that the rules must not apply in that order! Similarly, if the derivation yields the right answer, then you know that is a possible correct order. If all orders yield the right answer, then you know the rules do not interact.