

ELEMENTARY PHONOLOGY  
FROM AN ADVANCED POINT OF VIEW:  
A GLOSS ON K&K

Arnold Zwicky

Ohio State University

0. Introduction

The function of a textbook is to introduce concepts and principles and to motivate them. In some cases this is done explicitly; these are the official lessons of the text. But in many cases ideas are presented by assumption, by example, or by inference. There is nothing reprehensible in the latter practice. Indeed, in an introductory text it is absolutely necessary; the point is to induce a conceptual framework and a set of skills, not primarily to expose the foundations of the discipline, and a good textbook mixes explicit and implicit presentation in an artful way.

Nevertheless, it is usually a good idea to examine the foundations, if only because they are often shakier than we imagine. In addition, the instructor in an introductory course should be prepared to consider foundational issues, to read between the lines of the text, for the sake of inquiring students. Finally, when the students include apprentices in the discipline, the instructor has an obligation to provoke critical thought about basic concepts and principles.

In this spirit, I now approach the early chapters of the 1979 text *Generative Phonology: Description and Theory* by Michael Kenstowicz and Charles Kisseberth, hereafter K&K. The issues that concern me are the distinction between ALLOPHONIC and MORPHOPHONEMIC rules, the distinction between AUTOMATIC and NONAUTOMATIC rules, and the nature of K&K's argumentation for particular underlying representations. K&K downplay the allophonic/morphophonemic distinction, they ignore the automatic/nonautomatic distinction, and their arguments for underlying representations presume that phonological rules are automatic.

1. Allophonic/morphophonemic, Automatic/nonautomatic.

Chapters 1 through 4 of K&K are designed to set the stage for those following, which treat such theoretical issues as abstractness and rule interaction. Chapter 2 introduces the proposal that a phonological description of a language be factored into a LIST (containing all that

is unpredictable about the pronunciation of the morphemes in the language) and a set of RULES (predicting all the rest).

The student is introduced to typical cases of allophonic rules in one example treated in the first part of the chapter (aspiration in English), the three cases in succeeding headed subsections (from Zoque, Papago, and Chatino), and five of the six exercises at the end of the chapter (from Georgian, Sierra Popoluca, Greenlandic Eskimo, Mohawk, and Sierra Miwok). In the exercises, the student is invited to choose basic allophones, using five (not entirely independent) criteria supplied in the text: (a) choose the 'elsewhere' allophone, the one with the least limited distribution; (b) choose the allophone that is least marked with respect to its distribution in the languages of the world; (c) choose the basic allophone so that the resultant rules are natural, in the sense that they are paralleled in many languages; (d) choose the basic allophone so that the resultant rule has a phonetic rationale; (e) choose the basic allophone so that the resultant rule is an assimilation. Note that the terms 'phoneme' and 'allophone' do not appear in this discussion in K&K, though they do here.

In Chapter 2, all the examples and exercises involve what appear to be automatic rules--the allophonic cases just mentioned, as well as automatic morphophonemic rules in English (governing the alternations in the noun plural suffix) and Chukchee (vowel harmony), and what are apparently automatic morphophonemic rules operating in the phonological phrase domain (Chimwi:ni vowel shortening in preantepenultimate syllables) and the phonological word domain (Margi tone dissimilation).

The student is thus given to expect that phonological rules are typically automatic, and in Chapter 3 (Alternations) K&K explicitly state criteria of PHONOLOGICAL PREDICTABILITY and NATURALNESS (PLAUSIBILITY) for rules, analytic criteria that reinforce the expectation in favor of automaticity. Indeed, the major pedagogical illustration in Chapter 3, Russian word-final devoicing (hereafter FD), is automatic by any criterion one could imagine.

From Chapter 3 on the phenomena under discussion are all morphophonemic (some automatic, some not). Though K&K say that the transcriptions they give are phonetic, that the segments in them are 'sounds', the fact is that from the beginning of Chapter 3 the transcriptions are almost all phonemic (so that the segments in them are phonemes). In Chapter 2, underlying representations transcribed in slashes are phonemic in character, and the data are phonetic; beginning with Chapter 3, underlying representations are nearly all morphophonemic in character, and the data are all in some kind of phonemic transcription.

K&K do recognize the distinction between rules neutralizing phonemic distinctions and those distributing allophones ("they are both instances of context-determined pronunciation--but...the phonetic properties they assign have a different status", (p. 52), but they downplay it. What they do not recognize, at least in the early chapters, is the distinction between rules having only phonological conditions on their applicability and rules having lexical, morphological, or syntactic conditions on their applicability--that is, between AUTOMATIC and NONAUTOMATIC rules.

This distinction is first explicitly mentioned by K&K in their Chapter 5 ("Evidence and Motivation"), in connection with the methodological principle, stated on p. 142, that a 'phonological solution' (that is, an automatic rule) is to be preferred over a 'lexical' or 'grammatical solution' (that is, a nonautomatic rule); the ensuing discussion contrasts a paradigm example of an automatic rule, Russian FD again, with a clearly nonautomatic rule, the lowering of /i:/ to /e:/ in certain colloquial Czech morphemes (but not in others). Nevertheless, although K&K in effect draw the automatic/nonautomatic distinction on pp. 142-5, they do not provide any terminology and make nothing further of the distinction.

Now of course Kenstowicz and Kisseberth themselves hold the orthodox position within generative phonology that there IS no theoretically important distinction between allophonic and morphophonemic rules, nor any theoretically important distinction between automatic and non-automatic rules. That is, they would deny both the component-interaction assumption of structuralist phonology, hypothesis A below, and also the component-interaction assumption of natural phonology, hypothesis B below.

- (A) All morphophonemic rules apply before all allophonic rules.
- (B) All nonautomatic rules apply before all automatic rules. ("Rules first, processes last," in the wording of Donegan and Stampe (1979:156).)

For K&K, nonautomatic morphophonemic rules, automatic morphophonemic rules, and (automatic) allophonic rules are all just rules, capable of interacting with one another in any logically possible fashion, describable by the same formalism and with the same feature system, and subject to the same general conditions on their applicability. This theoretical position is woven into their text, so tightly that neither hypothesis (A) nor hypothesis (B) is ever even stated. Halle's classic argument against hypothesis (A), involving Russian voicing assimilation in obstruent clusters, appears in the discussion of 'phonological' versus 'grammatical' solutions in Chapter 5, but, as

Nathan and Epro (1982:480) observe, "Its historical significance is not mentioned, nor is its relevance to the question of a taxonomic phonemic level." Indeed, a discussion of hypothesis (A) could have served as a model of theoretical argument in phonology, since there is now an impressive array of evidence, of at least two distinct types (rules functioning both morphophonemically and allophonically, allophonic rules feeding or bleeding morphophonemic rules; see the summary in Zwicky 1982:879), indicating that this very attractive proposal is simply wrong.

K&K's neglect of hypothesis (B)--a proposal that is, I should add, impressively supported by a great many of the phenomena that are discussed in their text and illustrated in its exercises, and is not clearly counterexemplified by any of these--might be simply a result of their sharing in the widespread impression that hypothesis (B) says exactly the same thing as hypothesis (A) (an impression I might have inadvertently contributed to in Zwicky (1982:879) by providing a table in which the Donegan/Stampe 'rule-process' distinction appears parallel to the natural generative phonology distinction between 'morphophonemic' and 'phonological' rules; the surrounding text makes it clear that neither distinction is the traditional one between morphophonemic and allophonic rules). This impression is incorrect; Russian FD is morphophonemic, since it neutralizes phonemic distinctions, but it is unquestionably automatic. But K&K might simply have thought that hypothesis (B) was wrong. If so, they again miss a chance to examine a theoretical hypothesis on the basis of the data they discuss.

## 2. Arguing for URs

I turn now to K&K's discussion (46-62) of the Russian rules FD, 1-drop, and Dental Stop Deletion (DSD), an extended presentation that introduces the student to the reasoning involved in selecting underlying representations (URs) in instances of morphophonemic alternation.

FD serves as the paradigm case here, as I remarked above. The initial table of data presents both alternating masculine noun stems like /xlep xleb/ 'bread' and nonalternating masculine noun stems like /xolop/ 'bondman'. There is even a morphological minimal pair, alternating /porok porog/ 'threshold' and nonalternating /porok/ 'vice'. At this point, we must distinguish (as K&K do much later, in Chapter 5) between two aspects of automaticity, what I shall call CONTEXTUAL AUTOMATICITY and LEXICAL AUTOMATICITY; a rule is contextually automatic if the environment in which it applies can be stated entirely in terms of phonological constructs, and it is lexically automatic if the morphemes or words in which it applies can be picked out entirely by virtue of

their phonological shape. In many cases, the two types of automaticity run together. Russian FD is, as it happens, a case in which they can fairly easily be distinguished.

## 2.1 Alternative Analyses

Given the initial facts that K&K present, there are many options for an analysis of Russian, where an 'analysis' comprises both a lexicon (that is, a list of URs) and a set of rules. I summarize the principal candidates for lexicon + rule below, using 'bread' and 'bondman' as test cases (double slashes indicate that the representations are URs rather than (taxonomic) phonemic in character):

- Option A1. Lexicon: // xlep[+Rule] xolop[-Rule] //  
 Rule: p --> b / V\_\_V
- Option A2. Lexicon: // xlep[+Rule] xolop[-Rule] //  
 Rule: p --> b / \_\_\_ Dat Sg of Masc N,...
- Option B1. Lexicon: // xleb xolop //  
 Rule: b --> p / \_\_\_#
- Option B2. Lexicon: // xleb xolop //  
 Rule: b --> p / \_\_\_ Nom Sg of Masc N,...
- Option C. Lexicon: // xle{b,p} xolop //  
 Rule: When the last segment in a morpheme is an obstruent with lexical voiced/voiceless alternatives, choose the former in one context and the latter in another.
- Option D. Lexicon: // {xleb, xlep} {xolop} //  
 Rule: When a morpheme has otherwise identical alternants, one ending in a voiced obstruent and the other in the corresponding voiceless obstruent, use the former in one context and the latter in another.

There are (at least) four separate analytic issues here: (a) whether the difference between allomorphs of one morpheme is to be represented as a choice between forms (options C and D), that is, as determined by a morphological rule, or as the alteration of a segment or segments

in a UR, that is, as determined by a morphophonemic rule; (b) where the difference between allomorphs is to be located--whether it belongs to the UR as a whole (options A1 and D), or whether it is to be localized in the alternating part of the morpheme; (c) whether the principle governing the choice of allomorphs is contextually automatic (options A1, B1, and corresponding variants of C and D), or contextually nonautomatic; and (d) whether the choice of allomorphs is lexically automatic (options B1 and B2, and corresponding variants of C and D), or lexically nonautomatic.

K&K's initial discussion of these matters focuses entirely on issues (c) and (d), contextual and lexical automaticity; (a) and (b) are examined only later, in Chapter 6 ("The Problem of Abstractness"). I will follow K&K in considering here only the question of automaticity, though it is not clear to me that deferring issues (a) and (b) is the best pedagogical decision; in my experience, the idea that morphophonemic alternations should be described by rules altering specific segments comes hard to many students, even when all the examples in the text have this form.

## 2.2 Lexical Automaticity

First, the question of lexical automaticity. K&K (49) give two arguments against treating the difference between nonalternating (/xolop/) and alternating (/xlep xleb/) stems as "an idiosyncratic peculiarity of each morpheme, an idiosyncrasy which must be memorized when learning Russian": (i) "according to this analysis it is an accident that 'bread' has two shapes"; and (ii) "this analysis says that it is an accident that there are no morphemes in Russian having a nonalternating final voiced obstruent". A few pages later they return to analyses, like A1, that include "some extra, arbitrary piece of information in the lexical representations of these morphemes to indicate that they are exceptions to the voicing rule" (54), and supply a version of argument (ii) above, (ii') "with this analysis it is a complete accident that there are no word-final voiced obstruents in Russian" (54), along with a new, corpus-external argument (iii) that

this treatment has no way of explaining why Russian speakers automatically know the correct pronunciation of a nonsuffixed morpheme when they hear it in a suffixed form...there is no predictable connection between the voicing character of a stem-final obstruent in the unsuffixed as opposed to the suffixed form of a stem; Russian speakers must hear each form before they can assign a correct pronunciation (voiced or voiceless) to the final obstruent.

Argument (i), I believe, is simply invalid. It IS an accident that 'bread' has two shapes in Russian ; 'bread' could have had a nonalternating stem, /xlep/. The difference between alternating and nonalternating stems must be represented SOMEHOW in the Russian lexicon. The question is whether the distinguishing mark should be a phonological feature (or features), or whether it should be a lexical mark associated with particular morphemes.

Arguments (ii) and (ii') point to an important feature of lexically nonautomatic analyses like A1 which I have not brought out so far: To be fully adequate, these analyses require not only a rule describing the occurrence of final voiced and voiceless obstruents in alternating morphemes, but also a generalization about the distribution of segments in URs, that is, a MORPHEME STRUCTURE CONDITION, or MSC. In analysis A1, the required MSC says that no UR ends in a voiced obstruent. In analysis B1, no MSC is required, since URs on this analysis can end in either voiced or voiceless obstruents.

When we turn to argument (iii), we see that it is as invalid as (i), given that an analysis like A1 requires both a rule and an MSC, whereas one like B1 requires only a rule. Consider a Russian speaker operating under analysis A1, and suppose that she is confronted with a suffixed form like /xlebu/ 'bread (dat. sg.)'. Assuming she has induced not only the rule appropriate for A1 but also the MSC accompanying it (if any MSCs are inducible, this one ought to be), she will know that the UR for 'bread' must end in /p/ rather than /b/--because, given the MSC, NO UR ends in a voiced obstruent.

The arguments for lexical automaticity then all reduce to a simplicity argument: A1 involves both a rule AND an MSC, but B1 involves only a rule (and the two rules are of comparable simplicity, indeed of comparable naturalness). At first glance, it might seem that the simplicity argument here is of a particularly compelling sort, pointing to a FAILURE TO EXPRESS INTRINSIC CONNECTION between different aspects of an analysis, in this case failure to express intrinsic connection between the existence of the MSC and the existence of a rule. The issue is the independence of the rule and the MSC. Could a language have the MSC (requiring that all obstruents at the end of URs be voiceless) without the intervocalic voicing rule? Could a language have the rule without the MSC--so that there would be a set of stems always having voiced-obstruent finals, another set of stems always having voiceless-obstruent finals, and an arbitrarily constituted third set of stems having voiceless-obstruent finals in word-final position, voiced-obstruent finals between vowels?

I am not entirely sure what the right answers to these questions are. But I find it hard to see any answer supporting an intrinsic connection between the rule and the MSC that doesn't directly lead back to an a priori preference for lexical automaticity. If the existence of the rule doesn't require the existence of the MSC, for example, then there are three (essentially arbitrary) classes of morphemes with respect to final voicing alternations: invariably voiced, invariably voiceless, and alternating between voiced and voiceless. Is this unnatural? (Certainly it is not IMPOSSIBLE.) To answer this last question, we must ask whether we take arbitrary--or, instead, phonologically determined--divisions of the lexicon to be the unmarked case for languages in general.

The issue here is NOT how our students should be directed in their analytic inclinations--they are certainly inclined to opt for both lexical and contextual nonautomaticity when given a chance and so need to be made alive to the very possibility of full automaticity--but rather how language actually works. As it now seems to me, a preference for lexically automatic over lexically nonautomatic analyses can be defended on the grounds of simplicity, and hence learnability, but cannot be defended also on the basis of crosslinguistic generalizations about systems of rules and constraints.

In any case, since K&K use Russian FD as their paradigm of morphophonemic analysis, they reinforce their explicit expectation that morphophonemic alternations will be 'phonologically predictable'. Indeed, cases like Russian FD could be seen as ARGUING FOR the expectation that morphophonemic alternations will be phonologically predictable, for in any such case a lexically nonautomatic analysis will require both a rule and an MSC, while a lexically automatic analysis will require only a rule, so that the lexically nonautomatic analysis will be more complex than its alternative.

### 2.3 Contextual Automaticity

The case for contextual automaticity of FD (that is, the arguments favoring A1 over A2, and especially B1 over B2) is considerably more straightforward than the case for lexical automaticity.

There are, first, corpus-internal arguments appealing to GENERALIZATIONS THAT WOULD BE LOST in contextually nonautomatic analyses. K&K give a quite clear demonstration that neither B2 nor A2 will do as an analysis of the Russian data, based on the fact that the morphosyntactic environments are various, sharing nothing beyond the fact that the contexts in which voiced obstruents can appear all begin with vowels,



whereas the contexts in which voiceless obstruents must appear are all word-final (in the data K&K present).

K&K also provide extensive corpus-external evidence in favor of the same conclusion, showing the literal automaticity--in foreign accents, borrowing, and word coining (53-4), though acronyms and the deformations of word games or disguised speech could also be cited here--of the alternations between intervocalic voiced obstruents and final voiceless obstruents.

#### 2.4 The Other Russian Rules

I assume that the foregoing evidence shows, as conclusively as any such thing can be shown, that in Russian stems alternating between voiceless and voiced obstruents, the voiced alternant appears in the UR. I now consider the other alternations in Russian that K&K present in the data of their Chapter 3: one having to do with the appearance or nonappearance of the /l/ marking the past tense, the other having to do with the appearance or nonappearance of a stem-final dental stop (/d/ or /t/) before this very /l/ of the past tense.

I begin by asking about the lexical automaticity of the /l/-zero alternations illustrated in the past tense form /pek/ 'he baked', versus other past forms of the same verb, like /pek+l+a/ 'she baked', and versus the past tense forms of other verbs, like masculine /pis+a+l/ 'he wrote' and feminine /pis+a+l+a/ 'she wrote'.

In the case of voicing alternations in stem-final obstruents, we had to choose whether alternating stems like /xlep xleb/ have URs ending in voiceless obstruents or in voiced ones. Choosing the voiceless version for such stems would force us into the lexically nonautomatic analysis A1, since URs like /xlep/ could not be distinguished from (nonalternating) URs like /xolop/ for the purposes of an intervocalic voicing rule. But we argued that in this case a lexically nonautomatic analysis (involving both a rule and an MSC) would be more complex than the corresponding lexically automatic analysis (involving only the FD rule), and this simplicity argument was the only one that stood up to scrutiny.

Now for the /l/-zero alternations we have to choose whether the past tense morpheme has a zero UR (in which case there is a rule inserting /l/ in the environments CV\_\_# and C\_\_V#, as in /pis+a+l/ and /pek+l+a/, respectively) or the UR /l/ (in which case there is a rule deleting /l/ in the environment C\_\_#, as in /pek/). But in this case--as opposed to the case of voicing alternations in stem-final obstruents--a lexically nonautomatic analysis with /l/-insertion is not really distinguishable on grounds of simplicity from a lexically

automatic analysis with /l/-deletion. The difference is that the /l/-zero alternation is unquestionably lexically nonautomatic, as K&K themselves point out (57, fn. 3); the past tense /l/ alternates with zero, but the adjectival suffix /l/ does not (cf. /krug+l/ 'round', based on //krug// 'circle'). Crucially, there is no MSC at work here: not only does /CU#/ occur freely (contrary to an automatic /l/-insertion rule), but so does /Cl#/ (contrary to an automatic /l/-deletion rule). Simplicity arguments, or a preference for 'phonological predictability', will not decide whether zero or /l/ is the better UR for the Russian past tense morpheme.

On to the alternation between a stem-final dental stop (/d/ or /t/) and zero, as in /klad+u/ 'I place' and /plet+u/ 'I plait' versus /kla+l/ 'placed (masc. sg.)' and /ple+l+a/ 'plaited (fem. sg.)'. Here nothing stands in the way of lexical automaticity, but K&K (58, fn. 4) make it clear that whatever the rule is, it is contextually nonautomatic, since /t/ and /d/ occur both within morphemes (/dlato/ 'chisel') and with /l/ morphemes other than the past (/pod+l/ 'mean, vile'). The choice for the 'place' morpheme is then between saying that it has the UR //klad//, marked for /d/-insertion before the past suffix (whereas //ple// would be marked for /t/-insertion before this suffix, and //pis+a// would be marked for neither insertion before this suffix), or saying that it has the UR //klad//, subject to a dental stop deletion rule that applies only before the past suffix.

Again, there is not much to choose between the analyses. One inserts a segment (peculiar to a lexical item) before the past suffix. The other deletes a segment (that is, a kind of mark on a lexical item) before the same suffix. There is no MSC to appeal to here, so the analyses turn out to be near equivalents.

### 3. Conclusion

I have argued that by blurring the distinctions between morphophonemic and allophonic rules, and between nonautomatic and automatic rules, K&K prevent students from entertaining two universal hypotheses of some interest. I have also argued that by encouraging students to believe that all rules accounting for morphophonemic alternations are fully (i.e., both lexically and contextually) automatic, they do not provide them with sufficient reason to distinguish (a) cases in which URs can be correctly induced on the assumption that derived representations are phonologically predictable from (b) cases in which URs or rules or both must simply contain indications of which rules apply in which circumstances. As things stand, students are encouraged to assume phonological predictability whether or not it can be independently defended.

BIBLIOGRAPHY

- Dinnsen, Daniel A. (ed.). 1979. *Current Approaches to Phonological Theory*. Bloomington: Indiana University Press.
- Donegan, Patricia J. and David L. Stampe. 1979. The study of natural phonology. In Dinnsen (ed.), 1979, pp. 126-73.
- Kenstowicz, Michael and Charles Kisseberth. 1979. *Generative Phonology: Description and Theory*. New York: Academic Press.
- Nathan, Geoffrey S. and Margaret W. Epro. 1982. Review of Kenstowicz and Kisseberth 1979. *Journal of Linguistics* 18:2.483-6.
- Zwicky, Arnold M. 1982. Review article on Dinnsen 1979. *Language* 58:4.873-89.