

Why a Conspiracy

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The notion of conspiracies in phonology is well known by now, so an extensive review of the subject would be superfluous. However, to lead up to the topic I wish to discuss I will briefly describe the central issues.

The best place to begin is with the well known conspiracy in Yawelmani discussed by C. Kisseberth (1970). The point is that there are several rules in Yawelmani (two of them are given in 1.) which serve the same function. In this case, they all insure that there are no syllable initial or syllable final consonant clusters in the output.

$$1. \emptyset \rightarrow i / C _ C \begin{cases} \# \\ C \end{cases}$$

$$C \rightarrow \emptyset / _ +CC$$

Kisseberth suggested, moreover, that these seemingly independent rules are actually fragmented manifestations of a single generalization, which might be stated as in 2., in much the same way as the rules in 3. are considered to be specific manifestations of the generalization in 4.

2. Syllable initial and syllable final consonant clusters are not permitted.

$$3. \begin{array}{l} t \rightarrow d / _ b \\ k \rightarrow g / _ z \\ z \rightarrow s / _ g \end{array}$$

4. $+Obstruent \rightarrow \alpha voice / _ \alpha voice$

This proposal gives rise to two questions which have been discussed in the literature. The logically prior question is this: Are such formally distinct but functionally related rules really instances of a single generalization or are these speculations merely a symptom of linguistic paranoia? The obvious place to test this hypothesis is in language change. For example, if functionally related rules tend to change in the same ways at the same time, it would support the conspiracy hypothesis. And, if such rules are instances of a single generalization, the second

question must be dealt with: What sort of machinery is needed to allow a coherent statement of the generalization and yet allow it to have diverse formal manifestations?

As I mentioned, these questions have been discussed; however, there is a third basic question which has received little explicit attention, if any.

The central defining characteristic of conspiracies is that there must be at least two rules which achieve the same end, two rules which do the same thing. In contrast to these situations there is a natural force of parsimony operative in language with the effect that ordinarily languages only have one rule to solve a particular problem. In fact, it is the feeling that conspiracies are unusual in this respect which makes them noteworthy. These considerations invite the question: Why do languages sometimes override the force of parsimony by having two (or more) rules to do the same thing? Why do functionally related sets of rules exist at all? I will focus on this question in the rest of the paper.

Given that a phonology with two ways of achieving the same end is more complex in some sense than a phonology with only one way to achieve that end, I think it is reasonable to assume that there must be contrary considerations at odds with parsimony which motivate the additional complexity. In a very interesting and insightful paper Paul Kiparsky (1970) has argued that there are certain functional considerations which motivate the introduction of complexity into phonological systems through historical change. One of these is the tendency to preserve morphological distinctions and the other is the tendency to reduce allomorphic variation within a paradigm. The effect of these considerations can be described in some what metaphorical terms: Sometimes languages want to preserve morphological distinctions or they want to have regular paradigms so much that they are willing to tolerate formal complexity in order to achieve this goal. In justifying this kind of explanation he discussed a wide variety of complexities that have been introduced into languages, including changes from unmarked to marked orderings, the imposition of seemingly ad hoc constraints on rules, and conspiracies. While I think his observations are generally correct, I do not think he dealt adequately with the particular type of complexity represented by conspiracies. That is, I think it is true that these functional considerations do induce complexity, but the question I am asking is more specific: Why

introduce a new rule as an already existing one of complexity? Why?

Consider an example which cites in support of the deletion of a vowel reduced because of the distinction. At the singular active 'sacrifice' was a:

5. 1st person
- 2nd person
- 3rd person

The forms on which deletes were a consonant. The Kiparsky, is that and -t in the second hence the distinction at a later point inserted the vowel the personal suffixes lying terms, the

6. → ayāk
- ayāk
- ayāk

Now, Kiparsky maintains vowel insertion to retain the distinction person. The reason functional effect serve the suffixes motivation for ad explanation, but been achieved in tion on the deletion is significant ab- tion rule is that personal suffixes tion as the consonant that there will be clusters. Thus, cations are considering them to the g rule must have two pment in Sanskrit like this. At th

introduce a new rule which performs the same function as an already existing rule. Why that particular type of complexity? Why a conspiracy?

Consider an example from Sanskrit which Kiparsky cites in support of the claim that complexity is introduced because of the tendency to retain morphological distinctions. At one point in the history of Sanskrit the singular active aorist paradigm of the verb yāj 'sacrifice' was as in 5.

5. 1st person / a-yāj-s-am/ → ayākṣam
 2nd person / a-yāj-s-s/ → ayāj
 3rd person / a-yāj-s-t/ → ayāj

The forms on the right are derived by a rule which deletes word final obstruents when preceded by a consonant. The significant thing here, according to Kiparsky, is that the personal suffixes, the final -s and -t in the second and third persons are lost and hence the distinction is lost on the surface. Then at a later point in time a new rule was added, which inserted the vowel ī between the aorist suffix and the personal suffix to yield, from the same underlying terms, the paradigm in 6.

6. → ayākṣam
 → ayākṣī
 → ayākṣīt

Now, Kiparsky maintained that the addition of the vowel insertion rule is motivated by the desire to retain the distinction between the second and third person. The reasoning behind the claim is this: The functional effect of the epenthesis rule is to preserve the suffixes, so achieving that end is the motivation for adding the rule. This is part of the explanation, but notice that this goal could have been achieved in other ways, by imposing a restriction on the deletion rule, for example. What I think is significant about the addition of the vowel insertion rule is that it not only serves to retain the personal suffixes, but it also serves the same function as the consonant deletion rule: it guarantees that there will be no word final consonant-obstruent clusters. Thus, if the functional result of complications are considered to be the motivation for adding them to the grammar, then the addition of this rule must have two motivations. I think this development in Sanskrit can more adequately be explained like this. At the time represented by 5., Sanskrit

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had two goals or targets. One of the goals was to not have consonant-obstruent clusters at the ends of words and the other was to retain the second and third person suffixes. At this time these two goals were in conflict because there was no way to satisfy both: The only options were either to apply or not apply the deletion rule and either way one of the goals would not be achieved. If the rule applied, the suffixes would be lost, and if it didn't apply, there would be word final obstruent-consonant clusters. The epenthesis rule was added, then, in order to resolve the conflict between these two goals by allowing both of them to be achieved. In general, the hypothesis I am suggesting is that conspiracies develop in order to resolve a conflict between two (or more) goals.

Another example which illustrates this kind of functional motivation for a conspiracy occurs in Lithuanian.¹ One part of the conspiracy is the rule in 7., a simple degemination rule.

7. $C_i C_i \rightarrow C_i$

This rule applies in a number of circumstances which are too complex to illustrate here (I refer you to examples discussed by Michael Kenstowicz in his dissertation on Lithuanian Phonology). The goal of this rule is obviously to do away with geminate consonants and that is one of the functions of the conspiracy.

A second rule is involved, in that it interacts with the conspiracy, though it is not, strictly speaking, part of it; it merely complicates things. This rule, 4. above, assimilates the voicing of obstruents to following obstruents. It accounts for the alternation in the prefixes illustrated in 8.

| | | | | |
|--------------|---------|-----------|-----------|--------------------|
| 8. <u>ap</u> | arti | 'Plough' | aparti | 'finish ploughing' |
| | dirpti | 'work' | abdirpti | 'workthrough' |
| | gyventi | 'live' | abgyventi | 'inhabit' |
| <u>at</u> | eiti | 'go' | ateiti | 'arrive' |
| | gimti | 'be born' | adgimti | 'be born again' |

Of particular interest is what happens to examples like those in 9. where the conjunction of these prefixes with appropriate stems creates a homorganic stop sequence.

| | | | | |
|-------|------|-------|-----------|-----------|
| 9. a. | puti | 'rot' | /ap-puti/ | → *aputi |
| | | | | → apiputi |

- b. teisti
- c. duoti
- d. bekti

The first two sequences are not fairly straight expected to apply but it does not vowel to break

- 10. $\emptyset \rightarrow i$
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This epenthesis conspiracy: its geminates serve rule. But it is that the applic obscure the pre application of serves the ider second type of discussed--pres

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assimilation is blocked only where its application would derive geminates. The function of the epenthesis rule in these cases then, is precisely the same. The only difference is that instead of precluding the application of degemination by getting rid of geminates, it prevents their derivation in the first place. And, in doing so, it serves the same two goals: it guarantees that there will be no geminates in the output and it promotes paradigmatic coherence by preventing the obscuring of the prefix-stem boundary.

A third, and final, example which illustrates the same kind of functional motivation for a conspiracy is found in Turkish.² The phenomenon at issue can be demonstrated by the absolute singular, dative singular, and absolute plural paradigms. Cited in 11. are examples of nouns which undergo no alternations to demonstrate the suffixes, which are \emptyset , a/e, and lar/ler, respectively. The vowel alternations in the suffixes are of course the work of the well known vowel harmony rule and, being irrelevant, will not be discussed.

| | | | | |
|-----|-------|----------|--------|--------|
| 11. | | absolute | dative | plural |
| | hand | el | ele | eller |
| | horse | at | ata | atlar |
| | ball | top | topa | toplar |

The nouns in 12. however do alternate: they end in a consonant cluster in the dative (and in other cases whose suffix begins with a vowel) whereas this cluster is broken up by a high vowel when it is word final or before a suffix beginning with a consonant.

| | | | | |
|-----|--------------|-------|--------|----------|
| 12. | chest | koyun | koyuna | koyunlar |
| | son | oğul | oğula | oğullar |
| | time | vakit | vakte | vakitler |
| | mouth | alin | alna | alinlar |
| | root | cezir | cezre | cezirler |
| | intelligence | akıl | akla | akıllar |

These alternations can be accounted for by positing underlying stem final consonant clusters in these nouns together with a rule of epenthesis like 13.

$$13. \emptyset \rightarrow i / C ___ C \begin{cases} \# \\ C \end{cases}$$

or by positing underlying representations with the consonant cluster already broken up by a vowel and a rule of syncope like 14.

$$14. V \rightarrow \emptyset / VC ___ CV \\ [+hi]$$

The existence of t alternation (note strongly supports will assume is cor

15. sheep
woman
sea

A limitation before going on. rid of all syllabl is too general as

16. steep
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folk
upper
surface
love

The class of syll. mitted seem to be they do not const but the best poss permitted cluster thing like 17., w

17. Syllable fin
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The existence of the forms in 15. which exhibit no
alternation (note especially the minimal pair koyun)
strongly supports the epenthesis analysis, which I
will assume is correct.

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|-----|-------|-------|--------|----------|
| 15. | sheep | koyun | koyuna | koyunlar |
| | woman | kadın | kadına | kadınlar |
| | sea | deniz | denize | denizler |

A limitation on epenthesis must be mentioned
before going on. The rule as stated in 13. would get
rid of all syllable final consonant clusters, but that
is too general as can be seen by the examples in 16.

| | | | | |
|-----|---------|------|-------|---------|
| 16. | steep | sarp | sarpa | sarplar |
| | harsh | sert | serte | sertler |
| | folk | halk | halka | halklar |
| | upper | | | |
| | surface | üst | üste | üstler |
| | love | aşk | aşka | aşklar |

The class of syllable final clusters which are per-
mitted seem to be describable in general terms, so
they do not constitute real exceptions to the rule,
but the best possible description of the class of
permitted clusters in standard terminology is some-
thing like 17., which is awkward.

17. Syllable final C_1C_2 is permitted only if C_1 is
a sonorant and C_2 is an obstruent, or if C_1 is s
or \check{s} and C_2 is a stop.

This awkwardness initially suggests that the classes
involved are rather dubious and hence the claim that
there is something general going on here seems rather
dubious. However, it appears that there is an under-
lying principal and the awkwardness is merely a func-
tion of inadequate formalism. The principle is that
clusters are permitted only when the first consonant
is more vowel-like than the second. Thus a sonorant-
obstruent cluster is acceptable since sonorants are
more vowel-like than obstruents and s or \check{s} , plus a
stop, is acceptable because continuants are more
vowel-like than stops.³ It is unclear how this con-
dition should be imposed on the epenthesis rule so I
will not attempt to. This aspect of the rule does
not affect the present discussion anyway. The main
point is that there is an epenthesis rule which gets
rid of unpermitted syllable final clusters.⁴

There is another rule which aids and abets epenthesis in securing its end, the degemination rule in 19., which accounts for the alternations in the nouns in 18.

| | | | | |
|-----|---------|-----|-------|--------|
| 18. | justice | hak | hakka | haklar |
| | silence | fen | fenne | fenler |
| | line | hat | hatta | hatlar |

$$19. C_i C_i \rightarrow C_i / \text{---} \left\{ \begin{array}{l} \# \\ C \end{array} \right.$$

The alternation here is between a geminate and single consonant so either the underlying form has a single consonant which is geminated when a vowel initial suffix follows or the underlying form has a geminate which is degeminated word finally or when a consonant initial suffix follows. Nouns like those in 11. which have single final consonants in all environments (plus the fact that there are no nouns which end in a geminate in all environments) indicate that the latter is correct. These nouns have underlying geminates, then, and they are reduced by rule 19. In getting rid of these geminates, 19. helps epenthesis achieve satisfactory syllable structure.

This is one of the goals served by the degemination rule, but, as before, it also serves another goal. By applying to reduce geminates, it precludes the need for epenthesis to apply and it thereby prevents epenthesis from splitting up geminate clusters. It seems reasonable to suggest, therefore, that the second goal is to avoid splitting up geminates. I might mention in support of this claim that elsewhere, in a paper by Michael Kenstowicz and myself, it was argued that this goal is a natural tendency which shows up in a number of languages.⁵

In these terms it is possible to explain the conspiracy in Turkish as follows. There are two goals: One is to allow only certain kinds of syllable final consonant clusters and the other is to avoid breaking up geminate clusters. With only the rule of epenthesis it is impossible to achieve both goals since the only option would be to either apply the rule or not, giving the two possibilities in 20., each of which violates one of the goals.

| | | | |
|-----|----------|-------|----------|
| 20. | a. hatıt | hatta | hatıtlar |
| | b. hatt | hatta | hattlar |

This conflict is resolved by having another rule—degemination which allows the satisfaction of both goals.

In concluding points I would like that functional analysis here can provide insight into logical phenomena. The claim is that human rational phenomena adopted by language covering the teleology explaining its exit to other rules. The approach though an everything. For the distinction between what we might call functional rules, along the line of distinction, it seems to have a functional claim. Such limited claim I am making.

The second part of the question "why" examples discussed the functional reason for allowing the attainment of these examples are because their functional examination of morphological qualification and That remains to be

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In concluding I will briefly reiterate the two points I would like to emphasize. The first point is that functional analysis such as I have demonstrated here can provide insight and explanation for phonological phenomena. The assumption underlying this claim is that human language is a reasonable and rational phenomena and that, therefore, rules are adopted by languages for some coherent purpose. Discovering the teleology of a rule, then, is the key to explaining its existence and its behavior with respect to other rules. There are obvious limitations to this approach though and it cannot be expected to explain everything. For example, if we can draw a distinction between what we might call "live" rules and "dead" rules, along the lines of Stamp's process-rule distinction, it seems likely that "dead" rules do not have a functional purpose in the same sense as "live" rules. Such limitations do not at all vitiate the claim I am making.

The second point is more specific, addressing the question "why a conspiracy?" With respect to the examples discussed here it seems clear that the functional reason for the existence of conspiracies is to allow the attainment of conflicting goals. Of course these examples are quite simple and were selected because their function was clear. It may be that examination of more complex conspiracies will require qualification and limitation of this explanation. That remains to be seen.

Footnotes

1. The data comes from Kenstowicz (1969) and Kenstowicz and Kisseberth (1971).
2. Example and discussion of the rules involved are in Lees (1961) and Foster (1969).
3. An interesting point about the scale of sonority in this example is that it seems to be non-continuous, because for example y counts as being the same in sonority as n in beyin "brain," beyne "dative." That shouldn't be surprising though, since it is very similar to the way in which languages impose discrete distinctions on other continuous scales such as tongue height in vowels. My guess would be that only low level phonetic rules are sensitive to continuous scales. Low-level rules are, of course, those which are sensitive to continuous scales. (See Kiparsky (1968) p. 9 for similar use of the term "low-level automatic phonetic processes.")

4. It should be noted that Foster (1969) has argued that syncope rather than epenthesis is the correct analysis. His argument, however, was based mainly on what I have claimed in the text is a false assumption. In particular, he assumed that there would be a large number of exceptions to either kind of analysis: the forms in 15. would be exceptions to syncope and the forms in 16. would be exceptions to epenthesis. It is this latter assumption I contested, and it is precisely predictability of the so-called exceptions in 16. which provides strong support for epenthesis. Another fact which supports epenthesis is that loan words with unpermitted consonant clusters both at the beginning and end are fixed up by the insertion of the vowel *i*. Some of the examples in 12. are in fact Arabic loans.
5. Kenstowicz and Pyle 1973. It might be thought that there is a contradiction to this claim in the Lithuanian example 6 discussed earlier. It is no more a contradiction though than German and French are to the claim that languages tend not to have front round vowels.

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Non-phonetic Envi

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In this model the representation not generative phonology phonemic. The Nature of the derivation cannot be generative which surface structure (1973)),³ the level is determined (Kiparsky & Stampe calls under traditional phonetic