UNMARKED BLEEDING ORDERS

by

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In his important paper "Linguistic Universals and Language Change",[1] Paul Kiparsky pointed out that the order in which a pair of critically ordered phonological rules apply does not always appear to be totally arbitrary, in the sense that the relative precedence of one rule over another is determined solely by data internal to the language. Rather, it seems that in many cases predictions can be made about the expected ordering of a pair of rules on the basis of the form and function of the two rules involved. In this regard, Kiparsky developed two concepts describing functional relations between rules, in terms of which, he claims, expected orderings can be characterized.

The first of these is termed a FEEDING relation. Two rules, A and B, are in a feeding relationship if one rule, say A, <u>creates</u> structures to which the other rule B can apply. If the ordering of the two rules is such that A precedes B, then a "feeding" order obtains. The opposite order of B preceding A is termed a "non-feeding" order. Chiefly on the basis of the diachronic change of rule reorderings, Kiparsky hypothesizes that feeding orders are more expected, and hence favored over non-feeding orders. That is, it is much more likely for a pair of rules in a non-feeding order to change into a feeding order than vice versa.

The second concept in terms of which expected orderings are described is termed a BLEEDING relation. Two rules A and B stand in a bleeding relationship if one rule, say A, alters a structure, such that rule B can no longer apply to that structure. If A precedes B, then the order is a "bleeding" order. The opposite precedence relation is termed a "non-bleeding" order. Again on the basis of the diachronic change of rule reordering, Kiparsky hypothesizes that non-bleeding orders are more expected and favored than bleeding orders. That is, two rules in a bleeding order are more likely to shift into a non-bleeding order than vice versa.

And underlying both of these tendencies (i.e. the favoring of feeding over non-feeding and non-bleeding over bleeding orders) is the apparent generalization that rules tend to be ordered in a fashion which permits their maximal application in a derivation. That is, "rules tend to shift into the order which allows their fullest utilization in the grammar."[2] Let us call this the "maximal application principle."

Our purpose in this paper is to point out a relatively well defined set of cases in which bleeding orders appear to be the natural and expected situation. On the basis of such examples we will argue that the principle of maximal application cannot be maintained in its most general and unqualified form.

Before proceeding with the discussion we think it is important to make two observations about the notions of feeding and bleeding relations. The first is that these concepts define a relation between rules only with respect to a given (underlying) form. Hence, a pair of rules may exhibit different feeding and bleeding properties with respect to different (underlying) forms. For example, in Lithuanian there is a rule which degeminates a geminate consonant cluster.[3] This rule accounts for alternations like the following, where the future desinence is /-siu/ and the imperative is /-kite/.

past	1 sg. fut.	imp. pl.	gloss
gerė	gersiu	gerkite	drink
kasė	kasiu ←-- /kas-siu/	kaskite	dig
teko	teksiu	tekite ←-/tek-kite/	flow

Lithuanian also has a rule of Metathesis which interchanges a spirant and velar stop when this cluster occurs before a consonant. This rule accounts for the alternate shapes of a verb stem like /dresk-/ 'to bind' -- dreskė, dreksti inf. (from /dresk-ti/), dreksiu (from /dresk-siu/), and drekskite (from /dresk-kite/). Note that the Metathesis rule feeds the Degemination rule in the derivation of the future form dreksiu by placing the root s after the k in position before the s of the future suffix. However, Metathesis bleeds Degemination in the derivation of drekskite by splitting up the

/k-k/ cluster, which would otherwise degeminate (cf. <u>tekite</u> from /tek-kite/). Thus, the same pair of rules may display different feeding and bleeding properties depending upon the structure to which the rules apply.[4]

The second point to observe is that a pair of rules may exhibit feeding and bleeding relationships in two quite different ways. For example, one rule may stand in a feeding relationship to another rule by virtue of creating new instances of structures which satisfy the conditions to the left of the arrow of the other rule. Thus, in Finnish there is a rule diphthongizing underlying <u>ee</u> to <u>ie</u>. Another rule deleting certain medial voiced continuants gives rise to new instances of <u>ee</u>, which are potential candidates for diphthongization.[5] On the other hand, one rule can stand in a feeding relation with another rule by creating new <u>environments</u> in which the latter can apply. For example, in Russian there is a rule which devoices obstruents in final position. This rule is fed by another rule which deletes a word final <u>l</u> when preceded by a consonant. If this consonant is a voiced obstruent, then it comes to be in word final position by virtue of the <u>l</u> dropping and thus is a candidate for devoicing.

Similarly, two rules can display bleeding relations in the same fashion. For example, certain dialects of German have a rule spirantizing voiced stops in position after a vowel. This rule stands in a bleeding relation with the German rule of Final Devoicing, since the latter alters the feature matrix of candidates for Spirantization so that they no longer meet the specification to the left of the arrow of the latter rule. Thus, given an underlying form like /tag#/ 'day' (cf taγe), there are two possible outputs: tak, if Final Devoicing precedes and bleeds Sprizantization; and tax if Spirantization applies first, a non-bleeding order. Given the marked status of bleeding orders, tax would be the favored outcome, since it allows for both rules to apply. And, in fact, it is from a prior bleeding to a non-bleeding order that the rules have shifted in most dialects that possess these rules in their grammars.[6]

It is situations of the fourth possible type that we are interested in in this paper -- situations in which one rule A stands in a bleeding relation with another rule B by virtue of A's altering a structure so that it no longer satisfies the environmental conditions of B. We shall argue that, at least in the types of cases we shall consider, bleeding orders are expected and favored over non-bleeding orders. We think it is significant that all of the examples of bleeding/non-bleeding orders discussed by Kiparsky are of the first type, where one rule bleeds another by altering the feature matrix of a structure so that it no longer satisfies the conditions to the left of the arrow of the other rule.

The first example we want to discuss comes from the Yawelmani dialect of Yokuts, an Amerindian language of the Penutian family.[7] This language has a rule shortening long vowels in a closed syllable, i.e. before a consonant cluster or a single consonant at the end of a word. This rule accounts for alternations like the following: do:s-ol 'might report', but dos-hin 'reports'; ṣa:p-al 'might burn', but ṣap-hin 'burns'; ?ile:-hin 'fans', but ?ile-l 'might fan'; hoyo:-hin 'names', but hoyo-l 'might name'. There is another rule in Yawelmani which inserts an i in the environment $C\_C\begin{Bmatrix}\#\\C\end{Bmatrix}$. As a result of the operation of this rule, some vowels that are underlyingly in closed syllables come to stand in open syllables. Thus, the Epenthesis rule potentially bleeds the Shortening rule by destroying the closed syllable context of the latter. Given the hypothesized marked status of bleeding orders and the maximal application principle, we would expect Shortening to apply before Epenthesis. However, as it turns out, the Shortening rule must follow Epenthesis, and hence be bled by it. This is shown by forms like the following, which have underlying long root vowels followed by consonant clusters in their lexical representations: ?a:mil-hin, ?aml-al /?a:ml-/ 'help'; mo:xil-hin, moxlol /mo:xl-/ 'grow old'; se:niṭ-hin, sentạl /si:nṭ-/ 'smell'; wo:wul-hun, wo:wl-al /wu:wl-/ 'stand up'.[8] Although Epenthesis bleeds Shortening, this nevertheless strikes us as quite natural. The reason, we suspect, is that rules which shorten vowels in closed syllables typically refer to "surface" syllabic structure, rather than to a more "abstract" syllabic structure different from the surface structure. The fact that Shortening applies only after the surface syllabic structure has been determined by Epenthesis thus seems quite reasonable. In addition, this preference of shortening rules for surface syllabic structure falls together quite straightforwardly with the parallel generalization that the inverse of Epenthesis --namely processes of vowel deletion -- also typically apply before shortening rules. Thus, Yawelmani also has a rule deleting the final vowel of a CV suffix like the imperative (which is underlyingly -ka) provided the suffix is preceded by a vowel. And if that vowel is basically long, then it undergoes Shortening by virtue of being in position before a final consonant. Hence, we find forms like the following: xatka, from /xat-ka/ 'eat!'; but, hoyok, from /hoyo:-ka/, and ?ilek, from /?ile:-ka/. Observe that here the vowel deletion process feeds the Shortening rule by creating new instances of contexts in which it can apply. This tendency for rules of vowel shortening to follow both rules of vowel deletion and rules of epenthesis is a curious asymmetry for a theory which determines expected orderings by a principle of maximal application. On the other hand, it falls out quite nicely if we say that rules like Shortening typically apply only after the surface syllabic structure has been determined.

The next case we want to consider comes from Tübatulabal, a Uto-Aztecan language.[9] In this language the past tense of a verb is formed by a process of reduplication in which a copy of the first stem vowel is placed to the left of the stem.

For example, poloŋa:n, opolo:ŋan 'to beat it for him'; tuga?anan, utuga?anan 'to make it deep for him'; kami:zan, akami:zan 'to catch it for him'. This language also has a rule neutralizing the contrast between voiced and voiceless stops in favor of the latter. It applies in both word initial and word final position. Such a rule is responsible for the following alternations: puwa:n, u:buwa:n 'to irrigate it for him'; to:yla:n, o:do:yla:n 'to teach him'.

Note that the Reduplication rule bleeds the Devoicing rule by making an underlying initial consonant medial phonetically. However, this ordering strikes us as expected, since typically rules of initial and final devoicing apply to segments which appear in such positions phonetically. This order of Devoicing after Reduplication also ties in with the fact that Tübatulabal has a rule which deletes word final vowels. Stops which come to stand in final position as a result of this rule also undergo devoicing. For example, the unsuffixed form of ta:wəga:nat 'to go along causing him to see' is ta:wək 'to see' from underlying /dawəga/ (cf. ta:wəgat 'he is seeing'). Observe that in the derivation of ta:wək the deletion rule feeds the devoicing process by creating new contexts in which it can apply. Given the maximal application principle, we should expect that the copying of the vowel into word initial position should follow Devoicing, while the dropping of the final vowel should precede. The fact that Devoicing follows both rules is an unexpected peculiarity for this theory, but is just what would be predicted by a theory which says that devoicing rules typically apply to segments which are initial or final in surface representation.

Washo, an Amerindian language of the Hokan family, provides the basis for our next example.[10] Washo has a rule of Stress Reduction which destresses a vowel if it is followed by a stressed vowel. Thus, the stem málŋ- 'acorn' is destressed in the diminutive malŋá:či. Similarly, the stem sésm- 'to vomit' is destressed in sesméwe? 'vomit', where the resultative suffix -éwe? is appended, and in sesmása?i 'he's going to vomit', where the near future suffix -ása?- is added.

The Stress Reduction rule operates close to the surface in Washo; consequently, it is fed by the rule of Vowel Drop, which deletes an unstressed vowel in the context $\acute{V}?\_\_CV$. For example, the stem dé?eg- 'stone' appears in its full form (i.e. disyllabic, with a stressed first vowel) when unsuffixed: dé?ek; but is reduced in the diminutive de?gá:či. In the diminutive not only has the second vowel of the stem been lost, but the first vowel has been destressed. Clearly, Stress Reduction operates on the output of Vowel Drop.

But just as the operation of Stress Reduction is necessitated by the loss of a vowel, the insertion of a vowel may render it unnecessary. There is a rule in Washo that inserts ɨ in the context $\acute{V}C\_\_C\begin{Bmatrix}\#\\C\end{Bmatrix}$. This rule accounts, for example, for the fact that a stem like álŋ- 'to lick' has the allomorph /alɨŋ/ in the imperative gálɨŋ 'lick it!', where no suffix follows, but /alŋ/ in lə́lŋi 'I am licking it', where the imperfect -i suffix follows.

Now note the example kálɨŋmáma?i 'he's finished licking it', where k̓- is the 3 pl. object prefix and máma?- is a stem meaning 'to finish'. In this form, ɨ-epenthesis operates to insert a vowel within the final consonant cluster of the stem, since a consonant follows. Stress is maintained on both the stem meaning 'to lick' and on the stem meaning 'to finish'. This is accounted for by ordering Epenthesis before Stress Reduction, a bleeding order. The maximal application principle would predict an output with stress only on the first stem by having a derivation in which both rules apply -- Stress Reduction first, and then Epenthesis. However, once again the bleeding order strikes us as natural in this case, since we claim that typically a rule like Stress Reduction will follow a rule like Vowel Drop and also will follow a rule of Epenthesis, even though the former is a feeding and the latter a bleeding order.

A slightly different example occurs in Lithuanian, where there is a rule of regressive voicing assimilation which assigns a value for voice to any number of obstruents equivalent to the final member of an obstruent cluster. Thus, the prefixes /ap-/ and /at-/ alternate with final voiced stops if the following stem begins with a voiced obstruent, as the following examples show: arti 'plough', [ap]arti 'finish ploughing'; dirbti 'to work', [ab]dirbti 'work through'; gyventi 'live', [ab]gyventi 'inhabit'; eiti 'go', [at]eiti 'to arrive'; gimti 'to be born', [ad]gimti 'to be born again'.

In addition, Lithuanian has a rule which inserts _i_ between homorganic stops across a prefix boundary. Hence, _pūti_ 'to rot' _apipūti_ 'to grow rotten'; _teisti_ 'to judge', _atiteisti_ 'to adjudicate'. Now what is predicted by the principle of maximal application if we join such prefixes to stems beginning with homorganic voiced stops? Such a principle claims that both Voicing Assimilation and Epenthesis should apply, in that order. On the other hand, a theory which claims that rules of cluster assimilation characteristically apply only after clusters have been broken up or formed (i.e. after both rules of epenthesis and deletion) predicts that Voicing Assimilation should not apply in the derivation of these forms, since a prior application of epenthesis should break up the cluster and thus bleed the assimilation rule. And, in fact, the latter makes the correct prediction, as the following forms indicate: _duoti_ 'to give', _atiduoti_ 'to give back'; _bėgti_ 'run', _apibėgti_ 'to run around'.

In Klamath, an Amerindian language of uncertain linguistic affiliation spoken in southwestern Oregon, the opposition between glottalized and non-glottalized consonants, as well as between unaspirated and aspirated (voiced - voiceless in the case of younger speakers) consonants, is neutralized before all glottalized consonants and before obstruents.[11] As in Lithuanian, the environment which conditions this rule of neutralization is a phonetic one, not an abstract one. There are many cases where a glottalized or unaspirated (voiced) consonant occurs in a neutralizing environment in underlying representation, but remains unchanged due to the elimination of the environment by the operation of some other morphophonemic rule.

For example, there is a stem ne:bg- 'to happen, occur', which has the allomorph /ne:pg/ in ne:pga 'happens, occurs'. But when a consonant initial suffix is added, the allomorph /ne:bag/ is found, as in ne:bagwapk 'will happen, occur'. The /a/ in /ne:bag/ is due to a morphophonemic rule which breaks up certain stop clusters in pre-consonantal position. This a-epenthesis rule is just one of a whole set of such rules operating in a variety of environments; all of these rules must precede the rule of Neutralization. As a second example, consider the stem newḷ̓g- 'to rule'; the underlying /l̓/ is neutralized in newḷga 'rules'(actually a syllabic /ḷ/), but surfaces in the noun newl̓aqs 'rule' and in newl̓aqta 'plots against', where a has been inserted to break up clusters with four consonants.

a-epenthesis rules are not the only rules which destroy the environment for Neutralization. In Klamath both glottalized and non-glottalized glides vocalize between consonants -- y-glides alternate with long, tense /i:/, and w-glides alternate with the long, tense vowel /o:/. Consider a stem like mbody̓- 'to wrinkle'. In pre-vocalic position, the allomorph /mboty̓/ occurs, as in mboty̓a 'wrinkles'; but in preconsonantal position, we find the allomorph /mbodi:/, as in mbodi:tk 'wrinkled up'. To account for mbodi:tk, the rule of vocalization must be applied before Neutralization, so that underlying /d/ is preserved.

It does not seem surprizing to us that every rule in Klamath that could bleed Neutralization (by operating on an underlying structure where a consonant is in the context for Neutralization and destroying that context) does so. Given a rule that says: neutralize the opposition x in a position y, where y may be a class of segments adjacent to x, it is typical that the position y is close to the phonetic surface rather than close to the underlying representation (in case the two are divergent).

Another example, similar to the Klamath case, occurs in Takelma, also a language of southwestern Oregon.[12] In Takelma the aorist stem of verb bases ending in a consonant cluster is formed by placing a copy of the stem vowel within the stem final consonant cluster: somdan 'I shall cook it', somoda?n 'I cooked it'; tamyanan 'I shall go to get her married', tamayana?n 'I went to get her married'; malginin, 'I shall tell him', malagini?n 'I told him'.

This rule interacts with another rule of Neutralization similar to that of Klamath. The opposition between voiced and voiceless and also between glottalized and non-glottalized consonants is neutralized in favor of voiceless non-glottalized consonants in position before another consonant. Now if we take a verbal base ending in a cluster whose first member is a glottalized consonant, the principle of maximal application predicts that this consonant should first be deglottalized, and only then be separated from the final member of the cluster by Reduplication. On the other hand, the principle that says that such rules of neutralization typically apply to surface representations predicts that the underlying glottalized consonant will reach the surface by having the consonant clusterbroken up by the copying process. And, once again, the latter theory is corroborated by the facts of Takelma, as the following forms show: lopdia^{u}?t 'it will rain', lop̓odia^{u}? 'it rained'; yokyan 'I shall know it', yok̓oya?n 'I knew it'; masgan 'I shall put it', mat̓saga?n (a neutralized t̓s shows up as s) 'I put it'. Here, just as in Klamath, the neutralization occurs only after the surface syllabic structure has been determined, this time by a copying process rather than a rule of epenthesis.

The final example of this type that we want to discuss comes from West Greenlandic Eskimo.[13] It is slightly different from the examples considered so far in that it involves a rule of metathesis, rather than an epenthesis or copying process. However, the generalization that certain types of assimilation tend to operate close to the surface representation still holds true. In West Greenlandic there is a rule which lowers the high vowels i and u to e and o when they stand in final position or are followed by a uvular. This rule interacts with a rule of metathesis, which interchanges a VC sequence, if that sequence is followed by a word final consonant: $V\ C_1\ C_2\ \# \dashrightarrow C_1\ V\ C_2\ \#$.

These two rules explain alternations like those found in the following singular-plural noun pairs: ameq, ammit 'skin'; nanoq, nannut 'bear'. The stems are basically /amiq-/ and /nanuq-/. The singular forms are derived simply by an application of the Lowering rule. In the plural, which is marked by a suffix -t, underlying /amiq-t/ and /nanuq-t/ first undergo Metathesis to /amqi-t/ and /nanqu-t/. A subsequent assimilation of q to a preceding nasal yields the surface forms. Note that in the underlying representation of the plural forms high vowels are followed by a uvular -- the context for Lowering. To derive the correct surface forms, we must order the Metathesis first, destroying the context of the subsequent Lowering rule. This bleeding order is predicted by a theory which claims that such assimilatory rules tend to apply after the surface syllabic structure has been determined by rules like Metathesis.

Before concluding, we would like to consider one more case of a rather different nature. This example is significant, since the concepts of feeding and bleeding are simply not applicable. On the other hand, our claim that certain types of rules typically refer to surface structure does seem to make the correct predictions.

In both Baltic and Slavic there is an underlying contrast between stressed and stressless morphemes. When a stressless morpheme, say a noun stem, is combined with a stressed suffix, the word accent occurs on the suffix. Hence, if the stem meaning 'snow' (/snieg-/ in Lithuanian, /sneg-/ in Russian) is combined with a stressed suffix like the dative plural, we find sniegáms in Lithuanian and snegám in Russian. But when these morphemes are appended to stressless suffixes like the accusative singular, then there is a rule inserting stress on the first vowel of the word: Li. sniẽga, R. snégu.[14]

In the evolution of Slavic sequences of a vowel - liquid - consonant underwent a modification such that the liquid and consonant are no longer contiguous, but are separated by a vowel. In South and West Slavic there was basically a simple metathesis of the root vowel and liquid: (C) V R C --→ (C) R V C. In East Slavic the outcome was different. Essentially what happened was that a copy of the stem vowel was placed between the liquid and the following consonant: (C) V R C --→ (C) V R V C.

What is interesting in this regard is to see how this change interacted with the Stress Insertion rule, which places accent on the first vowel of an unaccented word. Given a theory which says that rules of accent placement of the form "place accent on the nth vowel of a word" typically apply only after the surface syllabic structure has been obtained, we would predict that unstressed words with a vowel - liquid - consonant sequence should receive accent on their initial vowel. And, in fact, this is what happened, as evidenced by forms like the following: Li. /gard-/ 'town'- *gardáms*, *gấrdą*; /galv-/ 'head' - *galvóms*, *gálvą*; R. /gord-/ - *gorodám*, *górod* (cf. *zá gorod*); /golv-/ - *golovám*, *gólovu*.

It is not possible to argue that the Vowel Copy rule copied an unaccented version of the stem vowel in position between the liquid and the following consonant, because underlyingly stressed morphemes of this shape show up with accent on the copied vowel: e.g. Li. /várn-/ 'crow' *várnoms*, *várną*; R. /vórn-/ *vorónam*, *vorónu*. Hence, there must have been derivations like the following in East Slavic.

	/vórn-u/	/golv-u/
Vowel Copy	vórón-u	golov-u
Accent Insertion	-------	gólov-u

The form /vórón-u/ reduces to *vorónu* by a general rule.[15]

Thus, the order of the rules must have been Vowel Copy followed by Accent Insertion.[16] And this order is exactly what would be predicted by a theory claiming that rules which refer to the nth syllable of a word typically apply only after the surface syllabic structure has been determined. Note, on the other hand, that the concepts of feeding and bleeding do not apply here, since the rule of accent insertion applies whether it is ordered before or after Vowel Copy. A theory which characterizes expected orders in terms of these concepts would predict that in such cases either order is to be equally expected. Such a claim strikes us as highly suspecious.

In conclusion, we hope to have established the following points. First, in cases where a rule A potentially bleeds another rule B by altering structures so that they no longer meet the contextual conditions of B, a bleeding order seems, in the range of cases we have examined, to be the expected situation. Secondly, if this is correct, then the principle of maximal application will have to be restricted in scope to accomodate such cases.

Needless to say, at this point a number of questions arise. Can one maintain that a bleeding order is always expected in situations where rule A potentially bleeds rule B in such a fashion? Notice that all of the examples we have discussed involve rules in the A and B position of a particular type: the former are rules of epenthesis, copying, and metathesis -- rules which affect syllabic structure; while the rules in the B position are rules which crucially refer to syllabic structure. In such situations will bleeding orders be expected if both rules are rules affecting syllable structure? If both refer to syllable structure in their environments? Or is it proper to view expected orders in terms of the notions feeding and bleeding at all?

The generalization that seems to emerge from the examples discussed above is that rules of assimilation, neutralization, etc., tend to be predictably ordered to apply to "surface" rather than "abstract" syllable structure. This would appear to indicate that one can make some guess as to the position of a rule in the ordering on the basis of the formal properties of the rule itself. That is, such rules tend to apply after both rules of epenthesis and deletion, regardless of whether the latter feed or bleed them.

However, when one begins to examine this "generalization" a number of difficulties immediately spring to mind. To cite just one example, many languages have the following two rules in their grammars: a rule palatalizing a consonant before _i_, and a rule of apocope. Given the claim that bleeding orders are expected between an assimilation rule and a rule affecting syllable structure, we would predict that the apocope rule should precede, and, hence, bleed the palatalization rule. Yet a cursory inspection of languages possessing these two rules indicates that a non-bleeding order is typical. Perhaps one might suggest that the non-bleeding order is preferred because the _i_ which drops by apocope leaves a "trace" on the preceding consonant. We have not as yet examined the matter sufficiently to be able to determine if this suggestion is at all viable.

In any case, it is apparent that many more factors will have to be taken into account, before we can begin to make precise the notions of marked and unmarked rule orderings.

Footnotes

1. See Kiparsky (1968).

2. ibid., p. 200.

3. See Kenstowicz (1971).

4. See Anderson (1969) for a discussion of many such examples.

5. In Standard Finnish derived ee remains, while in many dialects it diphthongizes to ie, indicating that these dialects have shifted the rules into a feeding order. See Kiparsky (1968).

6. See Kiparsky (1968).

7. See Newman (1944).

8. Underlying long high vowels lower to e: and o:. In addition, vowels harmonize with the initial stem vowel in such a way that high vowels round and back if the initial vowel is u and low vowels round if the initial vowel is o. For details, see Kisseberth (1970).

9. See Swadesh and Voegelin (1939). We are indebted to Charles Pyle for bringing this example to our attention.

10. See Jacobsen (1964).

11. See Barker (1964).

12. See Sapir (1922).

13. See Pyle (1970).

14. The case suffix, a lax diffuse vowel, drops out by another rule.

15. See Halle (1971).

16. This appears to be a genuine case of rule insertion, i.e. the addition of a rule to a grammar in position before another, chronologically earlier rule. For discussion, see King (1970). Another, quite recent, rule has been inserted before Accent Insertion. This rule yields the contrast between ô (a tense, close vowel like in French beau) and o (an open vowel similar to that of English bought) in some southern Russian dialects. The open o results from basic /o/'s which receive accent via the Accent Insertion rule. Basically accented /o/ is realized as ô. Hence, a rule taking /o/ to ô must have been inserted in these dialects before the ancient rule of Accent Insertion.

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