TAKING A FALSE STEP

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A special abstractness problem in generative grammar—that of intermediate derivational stages containing elements or sequences that are not well-formed as surface representations—is examined. Suspicious analyses employing such FALSE STEPS are cited from the phonological and syntactic literature. It is argued that false steps cannot be ruled out in general, because there is support for many false-step analyses, in both syntax and phonology; a Welsh morphophonemic case is treated in some detail.*

1. BACKGROUND. The question of abstractness considered by Postal (1968:53–77) under the name of NATURALNESS concerns the character of underlying representations: can elements of underlying representations be of a different nature from the elements of surface representation? A predominantly negative, or CONCRETE, answer to the question says that a language can't be analysed as having the underlying front rounded vowel *y* unless it has surface *y*—unless, in fact, it has some surface *y*'s derived from underlying *y*. A predominantly positive, or ABSTRACT, answer to the question says that the language can be analysed as having underlying *y* anyway, certainly if there is multiple justification for it (cf. Kisseberth 1969, Brame 1972).

There is another question about sequences of elements in underlying representations: can sequences of elements (e.g. phonological segments within a morpheme) be of a different nature from the sequences found in surface representation? Can a language, for instance, be analysed as having morphemes containing the underlying sequence *l* plus dental even if the language doesn't have that sequence superficially?[1]

I am concerned here with some cases related to these problems. In each case, underlying representations are well-formed, in the sense that they contain only segments and sequences of segments that occur superficially, but some DERIVATIONS go off the rails. This situation is found in many published linguistic descriptions, both in phonology and in syntax. *Sound pattern of English* (Chomsky & Halle 1968) supplies many phonological examples, and any attempt at a comprehensive syntactic description is full of them.

Thus *SPE* (204) says that words like *push*, *pull*, *bullock*, and *full* have underlying lax *u*, undergo an unrounding rule to *i*, and then are subject to a rule rounding *i* back to *u*, which is the surface form. At the same time, other words assumed to have an underlying lax *u*, like *pun*, undergo an extension of Vowel shift, which yields lax *o*, which is then adjusted to *ʌ*. Neither intermediate stage—*i* (for *push*) or *o* (for *pun*)—is well-formed on the surface (in the dialect Chomsky & Halle are describing). Special rules are required to generate the actual forms.

* A shorter version of this paper was given at the 1972 summer meeting of the LSA, Chapel Hill, North Carolina; the expanded paper was read at Ohio State University on 13 November 1972. Both audiences gave me useful comments and suggestions. I am indebted to the John Simon Guggenheim Memorial Foundation for its support of this work.

[1] On rather weak evidence, I once suggested just such an abstract analysis for certain occurrences of the Sanskrit retroflex consonants (Zwicky 1965, §3.3).

In syntax, consider Langacker's 1965 treatment of French interrogatives. He posits a rule of Reduplication that takes an essentially[2] well-formed structure like the one associated with sentence 1, and converts it into the uninterpretable 2—which is then rescued by an Ellipsis rule, yielding the well-formed question 3:

(1) *Il pleut* 'It's raining.'
(2) **Il pleut il.*
(3) *Pleut-il?* 'Is it raining?'

Let me try to formulate what is common to these and similar cases. First, at some stage A in derivations, all representations are essentially acceptable surface forms in the language; i.e. there are neither unacceptable elements nor unacceptable combinations of elements.

Second, a rule R_1 applies to the representations at stage A and maps some of them into surface-UNacceptable representations at stage B. Call R_1 the BACKGROUND RULE and B a FALSE STEP.

Finally, a later rule R_2 eliminates the unacceptable aspects of stage B, perhaps performing other operations as well. Call R_2 the RESCUE RULE. Speaking loosely, the background rule turns some good forms into bad ones, and the rescue rule fixes this up.

2. CRITICISM OF THE EXAMPLES. The cases already given are very suspicious ones; it is instructive to see why this is so. First, the case of *push*: here a special rule, Unrounding, takes underlying lax *u* to *i*. This background rule has no motivation beyond the forms in question; it is designed to remove them from the domain of Vowel shift so that there can be surface instances of *u*. The rescue rule, Rounding, has one motivation beyond the forms in question: it is used to rescue ANOTHER false step, namely TENSE *ī* derived from underlying lax *u* in open syllables (*SPE* 194–5), which is diphthongized to *īw*, extended to *jīw*, and finally rescued by Rounding, giving *jūw*. In summary, the background rule for *push* has no independent motivation, and the rescue rule is motivated entirely by two false steps.

The case of *pun* interlocks with this one, for in the *SPE* analysis, every lax *u* undergoes either Unrounding or Vowel shift. The background rule for *pun* is Vowel shift, some form of which undoubtedly figures in English phonology. What can be doubted is its applicability to one lax vowel in addition to the tense vowels. Vowel shift must be 'generalized' in a peculiar way to accommodate the *pun* analysis.

Langacker's analysis of French interrogatives involves a background rule that must play some role in a grammar of French: Reduplication is responsible for the occurrence of the pronoun *elle* in

(4) *Cette femme est-elle folle?* 'Is this woman mad?'

What Langacker does is make this rule absolutely general in questions, so that it

[2] The hedge 'essentially' here and below is intended to separate the operation of some rule in question from the effects of other rules not relevant to the issue at hand. Thus the structure associated with 1 at the point in derivations where Reduplication applies might very well not be 'readable' as 1, because some obligatory rules not mentioned in the text (say, affix placement and number agreement) haven't yet applied. We then ask whether the structure associated with 1 is OTHERWISE well-formed (cf. fn. 3, below).

has to be rescued by the combined effect of two rules, Pronominalization and Ellipsis:

(5) *Q cette femme est folle*
→by Reduplication
Q cette femme est cette femme folle
→by Pronominalization
Q cette femme est elle folle (= 4).

(6) *Q il pleut*
→by Reduplication
Q il pleut il
(not altered by Pronominalization)
→by Ellipsis
Q pleut il (= 3).

The weakest point in this analysis is the special pronominalization rule required for 5. Against our expectations, it generates simple, rather than reflexive, pronouns, even though it applies within a simple S. And in order to generate alternative forms for WH-questions, as in

(7) *Quel tableau Henri préfère-t-il?*
(8) *Quel tableau préfère Henri?*
} 'What picture does Henry prefer?'

it must be made optional in exactly these environments; this looks like an ad-hoc complication of the rule, and goes against our expectations that pronominalization within a simple S will be obligatory rather than optional. Moreover, the Ellipsis rule in 6 lacks independent motivation.

3. CONTRA FALSE STEPS. On the basis of such examples, it would be natural to try to restrict linguistic theory by ruling out false steps entirely—by saying that any description involving a false step is ill-formed. Scattered throughout the literature are criticisms of false-step analyses, giving some implicit support for outlawing them.

Thus Zimmer 1967 expresses unhappiness with Lightner's 1965 analysis of Classical Mongolian vowel harmony, in which the back-harmonic vowel generated from *i* is *i*, which does not occur in the language and has to be merged with *i* by a rescue rule. Similarly, many people experience twinges over the English rule of Whiz-deletion, which yields *a man sick with envy* from *a man who is sick with envy*. For one-word adjectival phrases, the result of Whiz-deletion is unacceptable—**a man sick* from *a man who is sick*—and has to be rescued by an Adjective-preposing rule. Some critics have felt that the 'unreal' intermediate stage should be avoided by restricting the application of Whiz-deletion, and by deriving prenominal adjectives directly from relative clauses with predicate adjectives—or by deriving prenominal adjectives from some other source altogether, as suggested by Winter 1965. Indeed, there is surprisingly little hard evidence for Adjective-preposing.

Even if false steps are not explicitly ruled out, we find a PREFERENCE in syntactic discussions for derivations all of whose steps are 'grammatical', as it is often put.[3]

[3] Grammaticality of intermediate stages is, of course, not quite the issue here. Rather it is whether an intermediate stage in a derivation would lead to a grammatical output if operated upon only by (independently motivated) obligatory rules other than those in question.

The UCLA grammarians, for instance, criticize Rosenbaum's 1967 treatment of sentences like

(9) Bill is said to work hard

for its (in their words) 'excessively ingenious' derivation (Stockwell, Schachter & Partee 1972:531):

(10) *One says it (for Bill to work hard)
→ *It (for Bill to work hard) is said
→ *It is said (for Bill to work hard)
→ *Bill is said for to work hard
→ Bill is said to work hard

—a derivation that is bad right up to the last minute. The authors support a substitute analysis in which, 'with all but one small set of verbs of this class, all steps in the derivation are grammatical' (533); and for the three exceptional verbs, among them *say*, only one step is ungrammatical.

Moreover, it is often argued that an analysis is good because apparently unmotivated intermediate steps actually have surface realizations. This line of argument is an indirect indication of a PREJUDICE against false steps. A lovely example is Langacker's 1968 treatment of French possessives like *ma maison* 'my house', which he assumes to be derived through these stages:

(11) *la maison* (*la maison est à moi*)
→ **la maison qui est à moi*
→ **la maison à moi*
→ **la maison moi* (+MOD)
→ **la moi maison* (+MOD)
→ *moi maison* (+MOD) (= *ma maison*).

Of this approach, Langacker (56) says:

> Not only is it very economical to derive possessive adjectives in this way; there are compelling reasons why they must be so derived. A number of other possessive constructions result quite naturally as reflexes of the postulated intermediate stages of the derivation; these appear to be wholly idiosyncratic if considered in isolation from the analysis of possessive adjectives we propose.

The other possessive constructions referred to include

(12) *C'est une maison à moi* 'It's a house of mine' (for the third line of the derivation),

(13) *Cette maison est la mienne* 'That house is mine' (for the fourth),

and Old French and Italian constructions for the fifth.

4. PRO FALSE STEPS. Despite the widespread prejudice, I claim it would be wrong to outlaw false steps. Some are bad, some not. In general, it depends on the extent to which the background rule and/or the rescue rule are justified.

4.1. CLEAR CASES. Consider first a large class of cases in which no one has ever criticized false steps. Each of these involves a phonological rule of great generality and regularity, feeding a rescue rule that acts to create sequences pronounceable

in the language. The English rules of Auxiliary reduction and Progressive voicing assimilation interact in this way. There is no question about the existence of the background rule, Auxiliary reduction, which gives contracted forms of *is*, *has*, *would*, *had*, *am*, *are*, and *will*. In certain cases it creates word-final sequences of voiceless obstruent plus voiced obstruent, which are unpronounceable in English (perhaps universally)—e.g. *[kætz] from [kæt ɪz] *cat is*. Progressive voicing assimilation (which applies also to noun-plurals like *cats* and verb-presents like *hits*) then automatically shifts the false step *tz* to the correct *ts*. When the rescue rule applies not only to derived sequences, but also to the same sequences across morpheme boundaries, in underlying forms, then the case is especially strong. If the underlying shape of the English noun-plural and verb-present morphemes is *z* (instead of vowel plus *z*), the Auxiliary reduction example is of this type. But clearer cases abound: in Karok, 'basic *v* and *y* are lost when, through morphological processes [i.e. through affixation] they come to stand between two short vowels; vowel contraction ... then occurs' (Bright 1957:33). Vowel contraction takes place for original sequences of vowels across morpheme boundaries, as well as for those derived by the deletion of *v* and *y*; and there are no vowel sequences within words on the surface.[4]

Analogous examples in syntax would be re-orderings to fit some required surface order. Perhaps the English Whiz-deletion case is of this sort.

4.2. SYNTACTIC SUPPORT. One area of syntax in which the possibility of a false-step analysis has been much discussed is that of chopping rules (Ross 1967). Such a rule, which moves a constituent without leaving a trace in its former position, is to be contrasted with a copying rule, which leaves something behind. Although the end products of a chopping rule and of a copying rule followed by deletion would be identical, Ross claimed that only chopping rules were subject to his constraints. It would then be possible to tell, by checking the behavior of a rule with respect to the constraints, which class it belonged to. Note that the application of a chopping rule will not (ceteris paribus) lead to a false step—though a copying rule might, if there were a succeeding deletion rule that was obligatory in some of the structures generated by the copying rule. There are no such cases in Ross's dissertation.

Since 1967 there has been a lively debate surrounding the possibility that chopping rules might all be eliminated in favor of copying-plus-deletion,[5] beginning with Sanders & Tai 1972, who argue from data in Mandarin Chinese, English, and Lebanese Arabic. However, Neubauer 1970 points out that some deletion rules are not subject to Ross constraints. Drachman 1970 has attempted to re-analyse Modern Greek re-ordering transformations as copying followed by deletion, and Perlmutter 1972 has argued in great detail for a copying analysis of French relatives. Perlmutter supports the claim that a relative clause like the one in

(14) *les hommes à qui Marie parle* 'the men to whom Mary is speaking'

has a remote representation like

[4] My thanks to Lawrence Schourup for pointing out this reference.

[5] I am indebted to Ronald Neeld for reminding me of the significance of this literature for the false-step question.

(15) **les hommes à qui Marie parle à eux* '*the men to whom Mary is speaking to them'

—which is a false step, since 14 could be derived directly from its underlying structure (as relative clauses were in earlier transformational descriptions).

4.3. FELL SWOOPS VERSUS CHAINS. Situations in which unacceptable phonological SEGMENTS are in question are, on the whole, less clear than those in which SEQUENCES are at issue. The problem here is whether the background rule should be restricted or complicated; or whether it should apply generally, calling a rescue rule into play. Consider, e.g. a language with vowel harmony or umlaut, and with the very common asymmetrical superficial vowel system

i *u*
e *o*
a

In such a language, front harmony or palatal umlaut necessarily involves neutralization; if *o* and *a* are fronted, they will both be realized as *e*. Disregarding the rounding feature, should the shift be described as a complication of 16, i.e. as 17?

(16) $V \rightarrow [-back]$

(17) $V \rightarrow \begin{bmatrix} -back \\ -low \end{bmatrix}$

Or should the shift rule retain its generality, and feed a neutralization rule like 18?

(18) $\begin{bmatrix} V \\ -back \end{bmatrix} \rightarrow [-low]$

For a non-hypothetical example, consider the four French nasalized vowels $\tilde{\varepsilon}$ $\tilde{\jmath}$ $\tilde{\alpha}$ $\tilde{a}$; there are no surface vowels $\tilde{\imath}$ $\tilde{u}$ $\tilde{y}$ $\tilde{o}$ etc. In the analysis given by Schane (1968, §2.2), the nasalized vowels are derived from oral ones, so that (as in the previous hypothetical example) some neutralization must occur. Schane assumes a general nasalization rule:

(19) $V \rightarrow [+nas] / \_\_\_\_ \begin{bmatrix} +cons \\ +nas \end{bmatrix} \left\{ \begin{matrix} \# \\ [+cons] \end{matrix} \right\}$

He then reduces the resulting ten-vowel system to the actually occurring four-vowel system by two neutralization rules:

(20) $\begin{bmatrix} V \\ +nas \end{bmatrix} \rightarrow [+low]$

(21) $\begin{bmatrix} V \\ +nas \\ +low \\ +tns \end{bmatrix} \rightarrow [+back]$

Rule 20 realizes both $\tilde{y}$ and $\tilde{o}$ as $\tilde{\alpha}$, and both $\tilde{\imath}$ and $\tilde{e}$ as $\tilde{\varepsilon}$; rule 21 realizes $\tilde{a}$ and some cases of $\tilde{\varepsilon}$ as $\tilde{a}$. But it would also be possible to complicate the nasalization rule itself and derive the correct outputs (including the correct associations of alternants) in one fell swoop:

(22) $\begin{bmatrix} V \\ \langle +low \\ +tns \rangle \end{bmatrix} \rightarrow \begin{bmatrix} +nas \\ +low \\ \langle +back \rangle \end{bmatrix} / \_\_\_\_ \begin{bmatrix} +cons \\ +nas \end{bmatrix} \left\{ \begin{matrix} \# \\ [+cons] \end{matrix} \right\}$

To my knowledge, no one has suggested this fell-swoop treatment, probably because the result is so obviously several rules crammed into one, the sort of rule one would not expect to find in real languages; whereas all of Schane's rules are plausible. But I know of no evidence within French that would favor the three-rule over the single-rule solution—no evidence that Schane's rules cannot be ordered together, that they are subject to grossly different conditions on application, that they have disparate sets of exceptions, or the like.

There is at least one phonological problem, Finnish vowel harmony, for which the fell-swoop solution has been favored in the literature, although the writers do not in fact attempt to justify this treatment. Finnish has three front-harmonic vowels, *ä ö ü*; three back-harmonic vowels, *a o u*; and two neutral vowels, *i e*, which occur with both of the other sets. Suffixes agree in backness with roots. Kiparsky 1968, attacking an earlier suggestion by Lightner 1965 that backness be a property of roots as a whole (with individual vowels unmarked for backness), points out that roots with only neutral vowels take front harmony, a fact that cannot be explained in Lightner's system. He proposes that all vowels in roots be marked for backness, but that suffix vowels not be so marked in underlying forms; suffix vowels then harmonize by the following rule (leaving out details not essential to this discussion):

$$(23)\quad \begin{bmatrix} \text{V} \\ +\text{back} \end{bmatrix} \rightarrow [\alpha\text{back}] \,/\, [\alpha\text{back}]\ \text{X}\ \_\_\_\_$$

This rule is restricted to back vowels so as not to generate the back unrounded vowels *ï* and *ë*, false steps which would have to rescued by the neutralization rule:[6]

$$(24)\quad \begin{bmatrix} \text{V} \\ -\text{low} \\ -\text{round} \end{bmatrix} \rightarrow [-\text{back}]$$

Rardin 1969 has since pointed out a class of suffixes with back vowels after neutral roots. He proposes that suffix vowels, as well as root vowels, be lexically marked for backness, and formulates the harmony rule as follows (again ignoring inessentials):

$$(25)\quad \begin{bmatrix} \text{V} \\ \gamma\text{round} \\ -\gamma\text{low} \end{bmatrix} \rightarrow [\alpha\text{back}] \,/\, \begin{bmatrix} \alpha\text{back} \\ \beta\text{round} \\ -\beta\text{low} \end{bmatrix}\ \text{X}\ \_\_\_\_$$

This time false steps are avoided by having the rule apply only to vowels with opposite values for rounding and lowness. As with Kiparsky's analysis, the facts are consistent with a simpler harmony rule followed by the rescue rule 24. Rardin's preference for the single-rule solution may arise from the fact that his analysis compels him to specify that only non-neutral vowels condition harmony; once the class is mentioned in one part of the rule, it is natural to refer to it in another. In addition, Rardin remarks (230) on the way that *i* and *e* seem to function as a natural class in Finnish.

[6] Kiparsky's article argues against absolute neutralizations OF UNDERLYING DISTINCTIONS. Therefore, since *i* and *ï*, or *e* and *ë*, are not claimed to be distinct in underlying forms, 24 would be no violation of Kiparsky's principle.

Fell-swoop solutions will always be at least marginally simpler, in terms of the number of features mentioned, than rule-chain solutions. But the difference between the two formulations will almost surely be less than the 'slack' in present descriptive systems (the indeterminacy in feature-counting caused by inadequacies in feature systems and notational conventions, and by uncertainty how to weight different conventions). However, the real issue is the adequacy of the rules, not simplicity simpliciter.

4.4 THE WELSH SOFT MUTATION. A ban against false-step analyses would decide the questions in the previous section; but I believe the decision would often be wrong. Here I will consider a case similar to those just described—the soft mutation in Welsh, a rule that shifts stops in certain environments as follows:[7]

(26) $p \rightarrow b \qquad b \rightarrow v$
$t \rightarrow d \qquad d \rightarrow \delta$
$k \rightarrow g \qquad g \rightarrow \emptyset$

That is, except for g,

(27) $\begin{bmatrix} +\text{obst} \\ -\text{cont} \\ \langle +\text{vcd} \rangle \end{bmatrix} \rightarrow \begin{bmatrix} +\text{vcd} \\ \langle +\text{cont} \rangle \end{bmatrix}$ in some contexts.

If we are not permitted to let 27 take a false step, we must either use nested angle-brackets and the feature SEGMENT, as in

(28) $\begin{bmatrix} +\text{obst} \\ -\text{cont} \\ \left\langle \begin{matrix} +\text{vcd} \\ \langle -\text{ant} \rangle \end{matrix} \right\rangle_{1\ 2} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{vcd} \\ \left\langle \begin{matrix} +\text{cont} \\ \langle -\text{seg} \rangle \end{matrix} \right\rangle_{1\ 2} \end{bmatrix}$ in some contexts,

or else state the shift as two rules, 29 plus 27:

(29) $g \rightarrow \emptyset$ in some contexts.

The fell-swoop treatment in 28 seems to me to be utterly hopeless; probably both of the notational tricks used to achieve this solution ought to be disallowed. I take seriously only the second alternative, 29 followed by 27.

A false-step analysis uses the shift in 27 as a background rule, allowing an intermediate stage γ to be derived from g, and rescues it with the context-free rule

(30) $\gamma \rightarrow \emptyset$

Now what would make us choose this somewhat abstract analysis over the relatively more concrete solution? First, there is evidence internal to Welsh, concerning the intrinsic connection between g-deletion and lenition of the remaining stops. To begin with, an argumentum ex silentio: there is no reason to suppose that the two rules are not ordered together. More important, they apply in exactly the same environments. This fact would in itself carry little weight, were it not that the environments for the rules are a marvel of morphological conditioning: rules 29 and 27 would have to apply to the initial segment of a feminine singular noun after the definite article (but not a masculine noun, or any plural); a noun after any one

[7] The rule also shifts m to v, but since this alternation doesn't affect the argument, I prefer to ignore it here rather than complicate the exposition.

of a list of prepositions; a noun in an expression of time or space; the object of an inflected (but not periphrastic) verb; an adjective after the predicative particle *yn*; an adjective in the comparative (i.e. after the particle *cyn* or *mor*); a verb after the the negative, interrogative, future, and relative particles (or initially in a clause from which one of these particles has been deleted); and so on.[8] Consequently, it would be preposterous to treat the two processes as independent.

Second, a modicum of cross-linguistic evidence favors the false-step analysis. The argument is based on the following hypothesis:

(31) If a language has a rule of lenition by which underlying g is deleted, then any instances of underlying γ are also deleted.

Solid support for 31 is hard to find, since verification hangs on finding languages with (a) underlying g, (b) a lenition rule affecting g, and (c) underlying γ. In what follows I rely on the plausibility of 31 and hope that appropriate language data will be forthcoming.

The postulated linguistic universal 31 could come about in two ways:

(32) MOST FAVORED SEGMENT. There is a type of lenition by deletion. γ is the most favored segment, so that if a language has γ and deletes any segments at all, γ will be affected. The process may be generalized to delete other consonants (e.g. β or, in the case at hand, g).

(33) COMPOUNDING OF PROCESSES. Universally, there are two distinct types of processes—a lenition of g to γ, and a lenition by deletion of γ. The first process shifts some or all voiced stops to continuants (perhaps affecting some voiceless stops as well); the second deletes some or all voiced continuants.

These proposals have somewhat different implications, in that compounding of processes predicts the occurrence of languages with only the shifting lenition, besides languages with only the deletion lenition. The most-favored-segment proposal predicts only lenition by deletion, for g at least. But the lenition of g to γ seems to be even more common than deletion; this is a well-known historical change in English, Greek, and Spanish, among other languages; and there are synchronic gradations of this type in Gilyak and Loma (Ultan 1970). I conclude, tentatively, that $g \rightarrow \emptyset$ always proceeds in two stages, $g \rightarrow \gamma$ and $\gamma \rightarrow \emptyset$. If so, the false-step analysis of the Welsh soft mutation must be the correct one.

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[8] Bowen & Rhys Jones (1960:166–7) provide a convenient list.

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[Received 6 March 1973]