

The Free-Ride Principle and Two Rules of
Complete Assimilation in English*

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1. Summary.

The following situation occasionally arises during the process of constructing partial grammars: A number of plausible alternatives for the formulation of some rule present themselves, and these alternatives are indistinguishable, or nearly so, from the point of view of formal simplicity; however, if a particular candidate R_1 is chosen, the domain of applicability of some independently motivated rule R_2 will be increased when R_1 is ordered before R_2 . According to an oft-used methodological rule of thumb (the Free-Ride Principle), the analyst should choose this candidate (and get a 'free ride' on R_2).¹

After a few preliminary examples (from both syntax and phonology), some remarks on the logical character of the Free-Ride Principle, and a brief presentation of some a priori arguments for and against the Free-Ride Principle, I take up two morphophonemic rules of English (those determining the form of the prefixes in such words as assimilate, support, and irreflexive) which are customarily treated as assimilations so as to catch free rides on an independently required rule simplifying geminates. I argue, from the form of words like assimilate and dissimilate under contrastive stress in my speech, that these rules are deletions rather than assimilations. Thus they cannot serve as examples of the Free-Ride Principle, which (in general) lacks convincing support.

2. Examples of the Principle.

2.1. Agentives à la Lees. Consider first the Lees (1960:69-71) analysis of agentive nominals like an enthusiastic seller of cars, which is derived (irrelevant details aside) from something on the order of he sells cars enthusiastically. Lees does not derive forms like seller directly; instead he assumes an intermediate stage er+sell: "Note that we have placed Er, the agentive affix, directly before the verb, for under Rule (36*) it will be shifted to word-final position" (p. 71). Rule (36*) is the familiar affix-movement rule, required in the Syntactic Structures analysis of tensed verbs, progressives, and perfectives, and supported by the parallelism of prefixal to and suffixal ing.

Observe that there is no independent justification for treating er as a prefix. The rule(s) creating agentive nominals would be equally simple if er were inserted in its surface position, as a suffix. The reason for the prefixal treatment is that it catches a free ride on the affix-movement rule. Indeed, Lees treats the

inserted en of the passive and the inserted marker of action nominals in the same way, and with no more justification. This line of analysis is, of course, not peculiar to Lees, although it is strikingly and consistently exemplified in The Grammar of English Nominalizations.

2.2. Absolute Reflexives à la Lees and Klima. In their ground-breaking discussion of English pronouns, Lees and Klima (1963) take up the problem of the "absolute reflexive" construction in phrases like perjure oneself and absent oneself, which they argue are underlying absolute intransitive verbs (permitting no direct object) subject to a special, fairly late, rule "which inserts a replica of the subject after the verb...this obligatory 'object' is then pronominalized in the usual way: being part of the same simplex as its subject, which it repeats, it yields the appropriate reflexive pronoun" (p. 25).

Lees and Klima chose to formulate the special rule for absolute reflexives as something on the lines of

NP	AUX	V
1	2	3
+ 1	2	3+1

An alternative formulation, differing by only one feature marking, is

NP	AUX	V
1	2	3
+ 1	2	3+ $\left[\begin{array}{l} 1 \\ +REFL \end{array} \right]$

The formal difference is slight. However, the Lees-Klima analysis catches a free ride on the independently justified reflexivization rule, hence was preferred by them.

2.3. Spa, Spar, and Spark à la Chomsky and Halle. The Sound Pattern of English abounds in implicit applications of the Free-Ride Principle. The following instance is striking but not atypical.

Having argued that the underlying vowel in such words as spa, spar, and spark is /ə/, Chomsky and Halle go on to state a rule for the prediction of the phonetic quality of the vowel in question, approximately [ā] or [ã]. They do not treat the process straightforwardly, however; instead of a rule

$$s \rightarrow \bar{s} / _ \left\{ \begin{array}{l} \# \\ r \end{array} \left\{ \begin{array}{l} \# \\ c \end{array} \right\} \right\}$$

(with subsequent predictable addition of a centering glide), they postulate a glide insertion:

$$\emptyset \rightarrow v / s _ \left\{ \begin{array}{l} \# \\ r \end{array} \left\{ \begin{array}{l} \# \\ c \end{array} \right\} \right\}$$

The justification for this rather surprising version of the rule, which is formally more complex than the straightforward alternative, is that it catches five free rides on other rules (see the discussion in Chomsky and Halle 1968:215-6). The derivation for spa is

spæ	Underlying
spæw	by w-Insertion
spæu	by Glide Vocalization
spæo	by Vowel Shift
spæʌ	by Rounding Adjustment
spæʌ	by Backness Adjustment
spæʌ	by Tensing of <u>a</u>

Each of these five other rules has some independent justification. The Free-Ride Principle then favors the non-patent analysis put forth by Chomsky and Halle. Despite this, the straightforward analysis has a kind of plausibility that the ingenious Sound Pattern analysis lacks: one expects the vowel change, not the glide insertion, to recur in the phonologies of other languages.

3. Logical Character of the Free-Ride Principle.

The logical character of the Free-Ride Principle is somewhat peculiar. It is not a linguistic universal, substantive or formal: it does not delimit the notion "possible human language" or restrict the class of possible grammars, simply because it is applicable only in the absence of decisive evidence as to the relative adequacy of alternative descriptions and becomes irrelevant as soon as such independent evidence is discovered. Thus, if I come up with a transformational rule R which must be ordered after the reflexivization rule but which doesn't apply to absolute reflexives, I would conclude that R must be ordered before the absolute reflexive rule and that the absolute reflexive rule is a duplication-plus-marking rule, not a duplication rule. I would have no occasion to refer to the Free-Ride Principle in setting forth this analysis. Clear facts always take precedence over the principle.

The principle is, as I have said, a methodological rule of thumb. If it is useful, it predicts which of several apparently indistinguishable alternatives is most likely to turn out to be correct. And if its predictions are borne out by and large, the principle is useful. That is to say, the Free-Ride Principle is valid only insofar as the choices it makes are the ones supported when new evidence comes in. An empirical study of the principle will then be a search for new lines of evidence confirming or disconfirming the analyses it recommends. The position I take in this paper is that this evidence tends to be negative.

4. A Priori Arguments For and Against the Principle.

Even though the Free-Ride Principle is, in theory, confirmable or disconfirmable on empirical grounds (to the extent that any hypothesis is so confirmable or disconfirmable), it might be argued that there are considerations providing a priori arguments for the principle, along the following lines: the principle has the effect of increasing the domain of applicability of rules and of increasing

the length of derivations, so that if other fundamental assumptions of grammatical theory have these effects the Free-Ride Principle becomes more plausible. Such arguments are inherently weak, of course. Moreover, I claim that in the case at hand they are entirely without force, that a priori arguments for the principle are balanced by a priori arguments against it. I begin with the negative arguments.

4.1. Con: The Extended Evaluation Metric. It has been suggested (first, I believe, in Chomsky ms. 1956) that the evaluation metric for grammars be extended to cover the situation in which two grammars, employing the same set of descriptive conventions and equally adequate descriptively, are also equally simple. The proposal is that in these circumstances the grammar that provides the shorter derivations be adjudged the simpler. Even assuming that the technical problems associated with the definition of "shorter" have been solved, it is hard to imagine a situation in which the extended evaluation metric would be applicable. Still, the metric has some intuitive plausibility--unfortunately for me, this plausibility is almost surely spurious, for it depends upon the notion that the grammar with shorter derivations is to be preferred because it would be preferred by the infant language learner, who would naturally seek to minimize the number of steps necessary to produce an utterance, all other things being equal. That is, the plausibility of the extended evaluation metric appears to rest upon the (unwarranted) identification of steps in the derivation of a sentence by means of a grammar with steps in the production of an utterance by a speaker.

4.2. Con: Disjunctive Ordering of Rules. A better a priori argument against the Free-Ride Principle derives from the existence of disjunctive ordering of the subparts of phonological processes. According to Chomsky and Halle (1968:30), "a sequence of rules abbreviated in terms of the parenthesis notation constitutes a disjunctively ordered block; as soon as one of these rules is applied, the remaining rules are skipped within any one cycle of derivation"; they observe further that the correspondence between parenthesis notation and disjunctive ordering is not logically necessary. In the context of the present discussion, what is striking about disjunctive ordering is that it reduces the length of derivations and narrows the domain of applicability of (sub)rules. To the extent that phonological rules are disjunctively ordered, derivations are shortened.

4.3. Pro: Vacuous Application of Rules. It is customary to formulate phonological rules so as to apply to the widest possible class. In particular, if the operation of rule R on class C would not change any one of the members of class C, and if R is designed to affect the members of class D, where D and C together form a natural phonological class E, then R is formulated so as to affect E (thus affecting D 'visibly' and C 'vacuously'). As the Indian grammarian has it, in W. Sidney Allen's translation (1962:23): "the rules of grammar are like the rain; they apply whether or not any change is involved--as the rain falls alike upon the empty and the full". If rules are formulated so as to apply vacuously, then the domain of these rules is extended and the length of derivations involving these rules is increased.

4.4. Pro: Kiparsky's Reordering Principle. In an important treatment of rule ordering over time, Kiparsky argues for two principles

of historical change summed up in the single generalization "Rules tend to shift into the order which allows their fullest utilization in the grammar" (Kiparsky 1968:200). One consequence of Kiparsky's hypothesis is that rules change so as to widen their domain and so as to increase the length of derivations. However, this discussion of historical change is not particularly relevant to the Free-Ride Principle, in that the changes in question are changes in outputs as well as in the rule system, whereas the Free-Ride Principle concerns only choices of rule systems with no difference in output.

5. Two Rules of Complete Assimilation.

5.1. Statement of the Rules. The two rules of English phonology I shall consider are the rule PREFIXAL OBSTRUENTS, formulated by Chomsky and Halle (1968:222, 238) as

$$\left\{ \begin{array}{l} s \\ su \end{array} \right\} \left[\begin{array}{c} C \\ \text{acoronal} \end{array} \right] = \left[\begin{array}{c} C \\ \text{acoronal} \end{array} \right]$$

$$\begin{array}{cccc} & 1 & 2 & 3 & 4 \\ + & 1 & 4 & 3 & 4 \end{array}$$

and the rule N+RESONANT, formulable roughly as

$$n = \left[\begin{array}{c} +\text{consonantal} \\ -\text{obstruent} \end{array} \right]$$

$$\begin{array}{ccc} & 1 & 2 & 3 \\ + & 3 & 2 & 3 \end{array}$$

The first rule is intended to apply to certain occurrences of the prefixes ad, ab, and sub, and the second to certain occurrences of the prefixes in and con, and perhaps also en and syn. That is, PREFIXAL OBSTRUENTS is to apply in words like assume, assist, attest, attend, annex, and appear, suffice, support, and succumb, while N+RESONANT is to apply in words like immure, illegible, irreflexive, commingle, collect, corruption, and perhaps also ellipse, symmetry, and syllable.² PREFIXAL OBSTRUENTS is unproductive in Modern English (abfarad and subportion involve homophonous, but clearly distinct, prefixes), and N+RESONANT is nearly so. The restrictions on PREFIXAL OBSTRUENTS are intended to capture the fact that the rule does not apply in such words as absurd, subsume, and subtend, nor in admire or advice.

Before turning to my main task, that of criticizing the treatment of these processes as assimilations, I take up two problem areas which, though important in themselves, are peripheral to this task. I resume the major argument in section 5.4 below.

5.2. First Diversion: Analytic Problems. A number of interesting analytic problems arise in connection with forms like assume, support and collect. In particular, how can I defend the claim that the words in question are divisible in the way indicated above? Given that they are so divisible, how can I defend the claim that the prefix in attest is the same as the prefix in assume? And, granting all this, how can I defend the claim that the boundary dividing the formatives is a special boundary =, intermediate in strength between

the morpheme boundary + and the word boundary / or ##? I assume here only that these claims can be defended in a sufficient number of examples. Certainly, not every word whose etymology implicates one of the Latin or Greek prefixes mentioned above contains it synchronically; it would be hard to justify a bimorphemic treatment of achieve, for example, much less a treatment in terms of the special boundary = and the prefix ad. On the other hand, when forms occur in sets like resume, presume, consume, assume, it is natural to suppose that the words are bimorphemic, even though it may not be possible to assign a clear and invariant meaning to the morphemes involved. And the evidence adduced by Chomsky and Halle for the boundary = in certain words is, a fortiori, evidence that these words are bimorphemic. They give four principal lines of evidence: (a) verbs like permit, concur, compel, deter, and transfer have final stress even though they end in weak clusters (p. 94); (b) the rule ALTERNATING STRESS shifts stress forward in words like exercise, analyze, and clarify but not in words like comprehend, apprehend, intervene, introspect, introduce, contradict, and controvert (p. 95); (c) a special intervocalic voicing rule applies in resist, resemble, resolve, design, presume, and the like, but not in such otherwise analogous words as misogynist, asylum, parasitic, and philosophical (p. 95); (d) a rule introducing stress in the first syllable of words like Montana, pontificate, cantankerous, and lampoon fails to apply in combat, contend, convert, continue, and similar forms (p. 118).

5.3. Second Diversion: The Alpha Formulation of PREFIXAL OBSTRUENTS. The formulation of the rule N+RESONANT as a complete assimilation of n to a following liquid or nasal is straightforward. In contrast, the formulation of the rule PREFIXAL OBSTRUENTS as a complete assimilation of the (noncoronal) b in ab and sub to a following noncoronal consonant, and of the (coronal) d in ad to a following coronal consonant, is not obviously correct. For the alpha formulation to work, it is necessary to require that the prefix ad not occur in combination with roots beginning with p, b, f, k, or g, because the clusters dp, db, df, dk, and dg do not occur: there are no forms *adappear, *abbreviate, *adfect, *adclain, or *adgression (only appear, abbreviate, affect, acclaim, and aggression), even though the Chomsky-Halle formulation of PREFIXAL OBSTRUENTS would fail to assimilate the clusters in these forms. The (systematic) nonoccurrence of such words must be explained as the result of a (systematic) appearance of ab rather than ad in underlying forms, so that PREFIXAL OBSTRUENTS will operate upon underlying appear to yield appear, abfect to yield affect, abclain to yield acclaim, and abgression to yield aggression. This analysis is counter-historical, but not necessarily incorrect on that account. The analysis is, in any event, not particularly well supported, especially in view of the fact that the rule predicting the form of the prefix ex is similar in some respects to PREFIXAL OBSTRUENTS, but cannot conceivably be collapsed with it in any revealing way. Stated as an assimilation, this rule has the effect (perhaps in several steps) of assimilating the [ks] of ex completely to a following f or any

following $\left[\begin{array}{l} +\text{consonantal} \\ +\text{voiced} \end{array} \right]$ segment. Thus, beside exact, exclaim,

exhale, expire, exchange, expunge, and extract, there are effect, emit, enumerate, erupt, elapse, evict, ejaculate, egress, and edict. Inasmuch as the rules predicting the forms of ab, sub, ad, and ex are nonproductive and restricted to particular prefixes, it would not be surprising if they turned out to differ in detail to such an extent that they shared no significant features.

5.4. The Assimilation Formulation. I now return to the contended feature of PREFIXAL OBSTRUENTS and N+RESONANT, namely their statement as assimilation rules. Why have Chomsky and Halle chosen to formulate PREFIXAL OBSTRUENTS this way, rather than as, say, a consonant deletion rule? After all, no double consonants occur phonetically in the forms in question, so that a straightforward treatment of the processes would be state them as deletions and derive the correct outputs in one step.

The answer lies, of course, in the existence of an independently motivated rule DEGEMINATION, which simplifies geminate consonants. Given the existence of DEGEMINATION, the Free-Ride Principle selects the assimilation version of PREFIXAL OBSTRUENTS (and N+RESONANT) over the deletion version. The required ordering is PREFIXAL OBSTRUENTS (and N+RESONANT), then DEGEMINATION.

DEGEMINATION is motivated by words like unnatural, expire, dissemble, and totally, where identical consonants happen to occur on either side of a boundary (compare unpleasant, inspire, resemble, and completely). Chomsky and Halle argue in addition for morpheme-internal occurrences of double consonants; see, for example, their discussion of Russell, with stressed [ʌ] and intervocalic [s], versus Pusey, with stressed [yüw] and intervocalic [z] (p. 149).

6. The Deletion Analysis.

6.1. Evidence for the Deletion Analysis. The evidence for a deletion, rather than assimilation, formulation of PREFIXAL OBSTRUENTS and N+RESONANT turns on a careful statement of the conditions governing the applicability of DEGEMINATION. DEGEMINATION is obligatory within morphemes. It is also obligatory between morphemes when one (or both) of the morphemes is unstressed, as in the normal pronunciations of unnatural, totally, and with the.³ It is optional, in slow speech, when both of the morphemes bear stress, as in embalment, ruleless, subbasement, pen-knife, and black cat (see, for example, the discussion in Kruisinga 1925:113-4).

The significance of these facts is that when stress is repositioned, as in contrastive stress, DEGEMINATION ceases to be obligatory and double (or long) consonants may appear phonetically. Thus, in

On the contrary, I find your suggestion entirely unnatural.
You try to persuade him, and I'll try to dissuade him.
I didn't say I went with a suitcase, I said I went with
the suitcase.

I have phonetic geminates in unnatural, dissuade, and with the. However, in my speech the effect of stress repositioning on forms with underlying geminates across boundaries is to divide them into two groups--examples like the ones just cited, in which the geminates surface phonetically, versus all the examples affected by PREFIXAL OBSTRUENTS

and N+RESONANT (also the rule for the prefix ex), in which no geminates appear. That is, in

It's not a préfix, it's an áffix.

On the contrary, I believe the firmament to be immeasurable.
The number of stars is absolutely innumerable.

I have drawled vowels (but single consonants) in áffix, immeasurable, and innumerable, I also lack a geminate in

I didn't say inspire, I said éxpire.

Finally, a minimal pair:

It's not an ássimilation, it's a díssimilation.

Here, ássimilation has a drawled vowel, with a single consonant beginning the second syllable, while díssimilation has a geminate, the first [s] closing the first syllable, the second [s] beginning the second syllable.⁴ Note also the contrast between unnatural, with a geminate, and innumerable, without one.

In light of these facts, PREFIXAL OBSTRUENTS and N+RESONANT must be assumed to be deletions and to be ordered before DEGEMINATION. For if N+RESONANT were an assimilation, then unnatural and innumerable would not be (relevantly) distinguished at any point in derivations; and if N+RESONANT were a deletion ordered after DEGEMINATION, then unnatural and innumerable would not be distinguished at the point in derivations at which DEGEMINATION applied. Similarly for PREFIXAL OBSTRUENTS with respect to the contrast between dissimilation and assimilation.

6.2. A Modicum of Counterevidence. In their discussion of PREFIXAL OBSTRUENTS, Chomsky and Halle cite words like accede, succeed, and suggest as evidence for the assimilation version of the rule. They argue that "By the symmetry of the paradigms we are considering, these must have the underlying representations [/ab=kéd/, /sub=kéd/, /sub=gest/], although they have the phonetic representations [[ækslyd], [sakslyd], [sagjést]]... The Assimilation Rule...applies to give [[æk=kéd], [suk=kéd], [sug=gest]]. Next Velar Softening applies, followed by Diphthongization and Vowel Shift in the usual way... Hence the [phonetic] forms result from perfectly regular phonological processes and are quite analogous to [consume, resume, excite, incite, assume, assist, assign], despite superficial differences" (pp. 222-3).

The number of examples is small--succeed, succinct, suggest, accede, accelerate, accent, accept, accident and their derivatives. For most speakers, the seven [ks] examples are normal; many have [j] instead of [g] in suggest, however. Not only are there few examples, but in fact not all of them occur in paradigms that would supply evidence about their constituent morphemes; succinct, accent, and accident are "paradigmatically unsupported" in this way. Moreover, there are other words which English speakers probably feel to be analyzable, but which contain prefixal elements with extremely narrow distributions--the abs of abstract, the sur of surmount and surprise, the sus of suspend, etc. It would not be surprising to find marginal

prefixes sub, sug and ac as well. From the point of view of psychological reality, the burden of proof is on the linguist who proposes to claim that accelerate contains a prefix ab or ad. My claim is that the Modern English remnants of certain assimilation rules productive in Latin are neither productive nor assimilations, and that some of the Modern English descendents of forms derived by these rules in Latin are no longer to be explained by them.

6.3. Statement of Rules. In the interests of completeness, I provide revised statements of the deletion rules affecting ad, ab, sub, ex, in, con, en, and syn. All are minor rules.

$$\begin{aligned}
 n & \rightarrow \emptyset / \text{---} = \left[\begin{array}{l} +\text{consonantal} \\ -\text{obstruent} \end{array} \right] \\
 ks & \rightarrow \emptyset / \text{---} = \left\{ \begin{array}{l} r \\ +\text{consonantal} \\ +\text{voiced} \end{array} \right\} \\
 b & \rightarrow \emptyset / \text{---} = \left[\begin{array}{l} +\text{consonantal} \\ -\text{coronal} \end{array} \right] \\
 d & \rightarrow \emptyset / \text{---} = \left[\begin{array}{l} +\text{consonantal} \\ -\text{voiced} \\ -\text{continuant} \\ +\text{coronal} \end{array} \right] 6
 \end{aligned}$$

7. Conclusion.

I have argued that the rules PREFIXAL OBSTRUENTS and N+RESONANT should be formulated (for my dialect) as deletions, not assimilations. In this one instance, the prediction made by the Free-Ride Principle is incorrect. While I can scarcely be said to have demonstrated the general invalidity of the principle, I have emphasized the fact that the principle lacks empirical confirmation and hence should not be applied incautiously.

Footnotes

*Earlier versions of this paper were presented at the University of Iowa in May 1969 and before a phonology seminar at the Ohio State University in March 1970. Members of the two audiences provided a number of useful suggestions.

1. I am indebted to Morris Halle for the felicitous terminology.

2. In Zwicky to appear, I argue that N+RESONANT is distinct from the rule NASAL ASSIMILATION, which applies in examples like compel and Congress.

3. Some speakers claim that they have geminates, or at least unusually long, consonants in some or all of these examples. The facts in my speech seem to me to be quite clear, and a sizable number of speakers agree with my judgments. I shall not speculate about the description or explanation of the treatment of geminates in dialects different from mine.

4. Again, not all speakers agree with my judgments--although a great many do. Some report geminates in all cases, others only in the N+RESONANT examples. Kruisinga (1925:114) prescribes geminates in restressed innumerable and immeasurable.

5. Although a few have [s] when the prefix is unstressed, as in succeed and accept.

6. My intent here is to have the rule delete d when followed by any consonant except m or ɣ.

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