The Principled Grammar of the English Plural Suffix

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1. The Truth Principle of Phonology. This paper is an argument for the Truth Principle for linguistic analysis that all generalizations of a grammar, grammatical and lexical, must be true of data. ‘True of data’ --if this is not apparent-- means true of utterances of the language of the grammar. Results of acceptance of the Truth Principle are that (1) a formal distinction is made among allophonic, neutralization, and suppletion rules (as argued in Hudson 1980), and, following from this, (2) rules or (equivalently) constraints need not be extrinsically ordered or ranked.

A rule of the grammar conforms to the Truth Principle if there are no exceptions to it or if the only exceptions to it are cases of properly including rules. A rule $A \rightarrow B / \_ CE$ properly includes another rule $A \rightarrow D / \_ C$ because $ACE$ properly includes $AC$. Thus if $A \rightarrow B / \_ CE$ is true and such properly including rules provide the only exceptions to $A \rightarrow D / \_ C$, then the latter is also true. The Truth Principle is stronger than the ‘True Generalization Condition’ of ‘Natural Generative Phonology’ (Hooper 1976: 13), which was not claimed to apply to lexical form. One result of acceptance of the principle is that rules are equivalent to constraints, since they don't change anything, but simply complete or select among alternatives.

This paper illustrates this Truth Principle of phonology by analysis of the alternation $[s] \sim [z]$ of the English plural suffix. The facts of the alternation are presented briefly in section 2; linguistic analysis of the alternation, based upon the Truth Principle, is presented in section 3; and three arguments for the analysis are presented in section 4.

2. The English plural suffix. As is well known, the English plural suffix has pronunciations $[s]$ and $[z]$, as follows.

   [kots] ‘coats’ [falz] ‘falls’
   [kejks] ‘cakes’ [piz] ‘peas’

(The form $[z]$ also appears with the epenthetic vowel of words like misses, buzzes, and wishes, data not relevant in the present discussion.) As is usually noted, the existence of words with final $[s]$ after sonorant consonants as in [firs] ‘fierce’, [fals] ‘false’, and [pis] ‘peace’ shows that the final voicedness which appears in plurals like fears, falls, and peas is a contrastive characteristic of the suffix, which therefore must be encoded as part of its lexical or mental dictionary entry.

3. Analysis. The Truth Principle prohibits representation of the lexical form of the plural suffix as simply $[z]$, voiced, because sometimes the suffix IS pronounced $[s]$, as in caps, coats, and cakes. It is false to say that the form of the suffix is $[z]$, for such a
statement means, subject to properly including statements of which there are none, that
this is ALWAYS pronounced [z]. We shall see that, despite the conventional wisdom that
one of the allomorphs of an alternating morpheme is its lexical form and the other(s)
derived (cf. Kenstowicz 1994: 89; Gussenhoven and Jacobs 1998: 58), it is quite
unnecessary to make this claim. Indeed, as will be argued, there are important reasons
not to make it.

Another way to understand the truth principle is as a prohibition of feature change,
deletion, and movement rules, and, consequently, of extrinsically ordered rules. If the
English plural suffix is lexically voiced, its pronunciation as [s] is possible only if the
lexical voicedness is changed or deleted by the grammar, by a rule ordered before the
‘lexical rule’ (rule of lexical form) according to which the suffix is [+voiced]. If such
change is prohibited, then lexical [z] is impossible. Note that allophonic variation is non-
problematic for the principle, because allophonic features are provided by rules which
COMPLETE a representation by supplying features which are lexically absent. Such
completions or insertions are consistent with the principle.

The lexical form, in features, underlying non-alternating [z] is:

[+continuant, +voiced]

We suppose that all other phonetically-present features of the morpheme are provided by
default rules of the grammar of markedness (that is, [-vocoid, -sonorant, +strident,
+coronal, -high] –particular choice of features is, however, irrelevant), or by allophonic
rules.

The truth-principle requires us to say that the form of the English plural suffix is NOT
as above, but

[+continuant, (+voiced)]

with parenthesized ‘+voiced’. The parentheses show, in their traditional interpretation,
that this feature may or may not be present in pronunciations of the morpheme. In other
words, +voiced alternates with zero –in other words: is neutralized in some
environment(s) of occurrence of the suffix. The representation [+continuant, (+voiced)]
presents the alternation of [z] and the archiphoneme of [z] and [s]. That is, the distinctive
(lexical) qualities of the suffix are sometimes [+continuant, +voiced] but in some
environment(s) only [+continuant].

English has a phonetic rule (certainly a universal tendency), as usually understood,
that adjacent tautosyllabic obstruents agree in voicing. I express the requirement of
tautosyllabicity as identity of the consonant release feature (Hudson 1995; +released in
syllable heads, -released in codas), but this is not crucial.

[-sonorant, æreleased]→ [βvoiced]

The rule bars [+voiced] from appearing in an obstruent suffix when this is attached to
words like cap, cat, and cake the final obstruents of which are [-voiced]. Given the two
possibilities offered by the lexicon in the representation [+continuant, (+voiced)], the
selects [+continuant] in such cases, and, furthermore, expands this as [+continuant, -
voiced]. By proper inclusion precedence, the other form of the suffix, [+continuant, +voiced], appears otherwise or elsewhere.

4. Arguments. Following are three arguments for the above analysis, concerning learnability, simplicity, and leveling.

4.1. Learnability. The human capability for language learning presupposes that we come to the task with strict and pervasive principles which make this possible. Stronger than others that have been proposed is the simple principle that all statements of the grammar should be (surface-)true statements, a principle which excludes from consideration most phonological analyses of the past thirty years. The history of modern phonological theory shows, I believe, that lesser principles have failed. Lacking principles as strong as the Truth Principle, the acquisition of phonology is almost as mysterious today as it was thirty years ago, and phonological analyses are perhaps as complicated and controversial in basic aspects, or moreso, than they were then.

The Truth-Principled analysis above of the English plural-suffix alternation is a completely accurate and empirically fully justified statement of our understanding of the matter: that the meaning ‘noun plural’ has two phonological forms [z] and [z] less [+voiced], that the latter form is that which appears adjacent to an invariably voiced or voiceless tautosyllabic obstruent, chosen by a phonological requirement fully supported by distributional facts and substantive evidence of productivity.

There is no unempirical claim of a unitary lexical form [z], nor any equally unempirical claims about feature change and/or deletion (or delinking) resulting in [s]. The two true statements of lexicon and grammar converge immediately for a correct derivation. Of the two possibilities offered by the lexical entry [+continuant, (+voiced)], in the word-final post-obstruent environment (where -released is supplied in the two word-final consonants by another rule), the rule requires or selects [+continuant] in words like cats and dogs, completes this as [+continuant, -voiced] in cats and as [+continuant, +voiced] in dogs, and leaves the default case of [+continuant, +voiced] to appear in words in which a sonorant precedes.

There is no preference here for rules versus constraints. Lexical representation of the English plural suffix as an alternation of [z] and the archiphoneme of [z] and [s] makes correct derivation possible when the contribution of the grammar is a constraint not a specification of change. The statement/rule above is not an instruction to change features. Given a traditional understanding of underlying /tz/ of cats, the rule cannot choose among corrected outcomes [ts], [dz]. It tells us only what is required, not how to achieve it. The correct outcome is assured by the combination of the rule/constraint plus lexical representation of the suffix with parenthesized [+voiced]. (Preference for completion without epenthesis I believe results from the Truth-Principled grammar of epenthesis (Hudson, forthcoming), but this issue, anyway, in no way favors the traditional claim of a unique underlying form.)

A lexically formalized distinction between neutralization and allophonic rules, as required by the Truth Principle, was presumed in classical phonemic theory but was rejected in standard generative phonology, following the argument of Halle 1959. Such a distinction was subsequently and probably unintentionally attempted, without satisfactory outcome, in Lexical Phonology’s assignment of neutralization rules and allophonic rules
respectively to ‘Lexical’ and ‘Post-lexical’ rule sets. The test of the distinction in Lexical Phonology, whether a rule is structure preserving or not, is based on an analytic claim of lexical presence of a contrast, versus the distinction of classical phonemic theory based upon phonetic contrast. Generative grammar has failed satisfactorily to constrain the complication of grammars –mainly arising out of the resulting necessity for rule/constraint order– which must result from claiming identity in the expression of these two rule types, which plainly differ in two important ways surely relevant for learnability: perceptibility and productivity, as was emphasized in the theory of ‘Natural Phonology’ (Stampe 1972): speakers are readily made consciously aware of neutralizations, certainly when exceptions are common, but not of allophonic phenomena, and they can typically suppress neutralization but not allophonic rules. An ‘automatic alternation’ (Wells 1949) like that in the English plural suffix has an intermediate status: voicing is effectively allophonic under neutralization but is otherwise contrastive.

4.2. Simplicity. Arguments from simplicity are derivable from Occam’s Razor: do not posit entities beyond necessity, where ‘necessity’, for the grammar writer, means evidence. The evidence for the parenthesis notation underlying alternations is the fact of the contrastively different pronunciations of a morpheme. I am aware of no evidence for unitary lexical form underlying alternations, and, indeed, in the absence of a principled way to exclude such unity in the lexical entry underlying suppletions such as go/went, these must contradict such a claim.

However, when simplicity is taken (simplistically) to mean raw notational economy in lexical representation, the parentheses such as appear in the representation [+continuant, (+voiced)], which would multiply incalculably throughout the lexicon as such analysis is extended to cover all such alternations traditionally treated with unitary lexical forms, will surely be supposed by many to represent a considerable and unreasonable formal complication in the Truth-Principled analysis. This supposition is mistaken.

First, even if the parentheses did validly constitute a complication of the lexicon, this would have to be weighed against the simplification which they allow in the overall grammar, by permitting fully empirical and highly constrained analyses of alternations, as compared with, for example, analyses of Optimality Theory, in which, large numbers of theoretically possible underlying forms have to be evaluated in relation to an even greater number of theoretically relevant constraints, when, consistent with the Truth Principle, a relatively small number of pronunciations of utterances of a language reasonably must determine a strictly limited range of possible lexical forms and grammatical constraints.

Second, anyway, the parenthesis notation should itself be considered formally simplifying. Recall that the lexicon, as traditionally and reasonably understood, associates forms with meanings, where the forms are contrastive and minimal (this is not to deny that our memories are non-minimal and even extravagant; but memory and grammar are to be distinguished). Consistent with our strongest understanding of linguistic markedness, phonetic complexity coincides with more lexical features, so lexical form is more or less extensive (and in this sense, complex) in terms of the amount of material it presents. The notation X(Y) is not equivalent to X AND XY, but to X OR XY (that is, the Xs of X and XY are identical), so if XY is obviously more complex than
X, the X(Y) is reasonably intermediate in complexity to X and XY, and as X(Y) is simpler than XY, [+continuant, (+voiced)] is simpler than [+continuant, +voiced]. Parentheses in lexical entries reduce information (Hudson 1986: 109-110). They express their enclosed features as not invariably associated with or determined by their associated meaning (of the morpheme in whose lexical entry they appear), but make these features subject to determination elsewhere in the grammar, in the case of (+voiced) of the English regular plural by the phonological neutralization rule/constraint requiring like voicedness in tautosyllabic obstruents.

Third, the Truth Principle makes possible the unitary expression of so-called ‘conspiracies’. Conspiracies are cases of different alternations attributable to the same phonological rule/constraint. Unitary expression of conspiracies must be favored by the simplicity criterion, as where the different alternations in the English plural and English past tense suffixes, [s]~[z] and [t]~[d], respectively, may be attributed to the requirement that adjacent tautosyllabic obstruents agree in voicing. Standard generative phonology has derived both of these alternations by a single rule changing the [voiced] feature of the suffixes to agree with that of a stem-final obstruent. But a single change rule cannot express the conspiracy in stem-suffix alternations in the Ethiopian Cushitic language Kambaata (Hudson 1976: 250), which are sometimes progressive and sometimes regressive. As understood in the usual historical metaphor, stem-final obstruents progressively assimilate suffix-initial /t/:

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/dag-too’i/ → /daggoo’i/ ‘she knew’
/oros-taanti/ → /orossaanti/ ‘you (sg.) will go’
/ub-tooti/ → /ubbooti/ ‘you (pl.) dig!’ (imperative)
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but suffix-initial /n/ regressively assimilates stem-final sonorant consonants:

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/kam-no/ → /kanno/ ‘let’s forbid’
/ful-naammi/ → /funnaammi/ ‘we will go out’
/er-noommi/ → /ennoommi/ ‘we folded’
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Parenthesis of neutralized features of stem-final sonorant consonants allows both cases to be unitarily expressed by the simple, true, constraint of the language that adjacent consonants of like sonority are alike in all other features.

*{C, αsonorant, αF} {C, αsonorant, -αF}*

The lexical form of the final consonants of the three sonorant-final stems above are, respectively and without insisting on particulars of feature representation which are irrelevant here, {C, +sonorant, (+nasal, +labial)} {C, +sonorant, (+lateral)}, and {C, +sonorant}. Assimilated features of the latter, which defaults as /r/, and of the suffix-initial obstruent which defaults as /t/, are neither parenthesized nor lexically present. The rule above supplies these when a sonorant consonant or obstruent precede in the word, respectively, and the redundancy rules yield /r/ and /t/ for these otherwise.
Unitary expression of such a conspiracy may, of course, also be achieved in Optimality Theory, provided there are three constraints, of which the third is surely not in the universal set required by the theory, ordered as follows:

\*\*\*C, αsonorant\*\* [C, αsonorant] [αF] \*\*[-αF]\*\* >> Stem-assimilation by /n/-initial Suffixes >> Suffix-assimilation by Stems

4.3. Leveling. Let ‘alternation’ mean ‘morphophonemic alternation’, cases of morphemes with allomorphs –phonemically different forms. The forms [s]~[z] of the English plural suffix present an automatic alternation, determined by productive phonology. Leveling is loss of alternation, for example where English a~an is replaced by simply a, as in a apple. English has relics of many alternations at various stages of leveling, from knife/knives (fricative voicing) to sweep/swept (closed-syllable vowel shortening) to was/were (sibilant rhoticization?). Three generalizations about leveling are that this:

1. is always potential in alternations,
2. is simplifying, and
3. takes place one morpheme at a time.

The evidence from leveling in favor of the Truth-Principled lexical encoding of alternations is that with lexical encoding of alternations this can be understood, appropriately, as potential, simplifying, and one-morpheme-at-a-time. The potentiality of leveling of an alternation in a morpheme is apparent in its parenthesized features. The simplication is loss in the lexical entries of alternating morphemes of the parenthesized feature or features which make them subject to the rule which distributes the allomorphs. Furthermore, as required by the Truth Principle, lexical encoding must be present BEFORE the first exception appears, so that when leveling begins it can affect one morpheme at a time.

By the way, the expectation for leveling in alternations is the explanation of an important generalization which is the central premise of Lexical Phonology: that neutralization rules do not apply in non-derived words. Why exceptions to neutralization should arise in non-derived forms is a mystery in Lexical Phonology (as in generative phonology more generally), but it is a necessary result of the Truth Condition, since, with the lexical encoding of alternations which the Condition requires, it follows from one-at-a-time loss of the encoding, parenthesized, features, consistent with the one form / one meaning principle (Anttila 1972: 100).

Let’s consider leveling in three English alternations, concerning fricative voicing as in knives/knife, flapping/voicing as in writer/write, and obstruent devoicing as in cats/dogs.

4.3.1. Fricative voicing. Alternation of [voiced] in English singular/plural pairs like knife/knives is nonallophonic and nonautomatic. The difference between [f] and [v] is contrastive/phonemic, so the truth principle requires that this difference of pronunciation be encoded in the lexical entry of morphemes in which it appears, approximately as follows for knife (where, with appropriate rules for completion of features by redundancy
rules including principles of markedness, the lexical features of [f] are [+continuant, +labial] and of [v] [+continuant, +labial, +voiced]):

/naj+[continuant, +labial, (+voiced)]/

Selection of +voiced in its environment yields [v] and leaves its zero alternant, [f], elsewhere. The rule is not productive: final [f] is nonalternating in regular nouns such as proof, cuff, laugh. Instead, a rule specific to the morphemes which have the alternation distributes the allomorphs by choosing a stem-final voiced alternant in plurals, approximately thus:

(+voiced) → +voiced / __ ], noun plural

According to the rule, in morphemes which have final fricatives encoded for the alternation as ‘(+voiced)’, the +voiced feature appears in the noun plural, with the conventionalized implication that its absence appears otherwise. Leveling, then, is understood as loss of the parenthesized feature, in one morpheme at a time—as is underway and evidenced when we hear knives instead of knives.

4.3.2. Flapping/voicing. Alternation in American English pairs like write/wri[D]eris nonallophonic and questionably automatic. The intervocalic alternant is ‘flapped’ and voiced. The phonetic features of the this alternant and even the environment of the flapping rule are not important, just the point that leveling is potential in this alternation, too, as evidenced by the existence of seeming exceptions like Plato and moity in formal speech, writ[ə]er in careful speech, and even wa[t]er in artificially careful speech, and the ability, generally, of those who have the rule freely to suppress it for purposes of clarity or presumed propriety. Such evidence of the potential for leveling is evidence that the alternation is encoded lexically, since only loss of the encoding feature, (+voiced), morpheme-by-morpheme, can describe the gradual nature of such leveling as simplification.

4.3.3. Obstruent devoicing. It is difficult to imagine leveling in the voicing alternation in the English plural suffix (identically 3rd-person present and noun-possessive suffixes and similarly in the past tense suffix). So long as the basic form is understood as voiced (/z/ or /d/), this is a quite stable automatic alternation. There is observed a tendency, however, which imaginably and eventually could lead to its leveling. Some speakers of American English devoice final voiced obstruents, and while to a trained listener these pronunciations may remain distinct from historical final voiceless obstruents, to others they are non-distinct: [firz] ‘fears’, [falz] ‘falls’, and [piz] ‘peas’, for example, sound like fierce, false, and peace.

Others who don’t have the final devoicing tendency may be expected to become aware of the voiceless pronunciation, and may, then, begin to immitate it. The pronunciations will vary at first between historical voiced and innovative voiceless qualities (variability which may reflect sociolinguistic as well as phonetic and lexical factors; some word-final consonants and vowels may inhibit or promote voiceless suffixes, and the voicelessness may be relatively advanced or retarded in one or the other
of the suffixes. The grammar of the innovators may even be transitionally complicated: they are, after all, not yet leveling an alternation but are mixing dialects, with social purpose. But if the innovative, devoicing, dialect spreads as new generations of speakers acquire the unmarked voiceless pronunciation, evidence for alternation in the suffixes will disappear. Leveling will be accelerated upon conversion of the alternation to a non-automatic *knives/knife*-type, and fully leveled with loss of all four cases of the parenthesized feature (+voiced) and the triumph of the rule/constraint that syllable-final, unreleased obstruents are voiceless.

References


