

The Relevancy Condition and Variables in Phonology*

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1. INTRODUCTION

Following the pioneering work of Stong [19] and Palacas [15], Jensen [10] proposed a constraint on variables in phonological rules called the Relevancy Condition. This condition severely restricts the power of phonological rules to act at a distance. Within the standard theory of phonology (Chomsky and Halle [6]), action at a distance is considered the unmarked case whenever variables are involved in a rule, since in that theory variables always receive their maximal interpretation. Accordingly, a rule of the form (1) has the effect of converting (2a) into (2b).

$$(1) C \rightarrow \begin{bmatrix} +\text{high} \\ -\text{back} \end{bmatrix} / \text{---} X i$$

- (2) a. katalani
b. k²atalani

The Relevancy Condition excludes such an interpretation of (1) by means of the constraint (3), which is understood as a universal restriction on phonological rules.

- (3) Only *irrelevant* segments may intervene between the *focus* and *determinant* in phonological rules.

The class of irrelevant segments is determined by the algorithm (4).

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- (4) The class of segments defined by the features common to the focus and determinant of a rule is the class of segments *relevant* to that rule, provided at least one of the common features is a major class feature. All segments not relevant to a given rule are *irrelevant*.

A major shortcoming of this statement of the Relevancy Condition lies in the definition of the terms *focus* (or *input*) and *determinant*, which are taken from Howard [8]. These terms may be defined by the schematized rule (5).

$$(5) \begin{array}{ccccccc} [] & \rightarrow & [] & / & [] & & X \\ \text{input} & & \text{structural} & & \text{determinant} & & \text{intervening} \\ =\text{focus} & & \text{change} & & & & \text{material} \end{array} \quad \underline{\hspace{1cm}} \quad (= \text{focus})$$

For an arbitrary phonological rule, it may be extremely difficult to separate the determinant from the intervening material in the environment statement, which even a brief inspection of the Main Stress rule of English [6:240] will make clear. Probably for rules of this type the terms defined in (5) are not appropriate. For the Relevancy Condition to be fully meaningful, it is necessary to have a precise definition of the terms used in its statement, and a clear notion of the types of rules to which it is applicable. Ringen [17] noticed that all the examples used in Jensen [10] to show application of the Relevancy Condition are rules of assimilation or dissimilation, and she proposed to restrict the application of the condition to such rules. She accomplishes this by defining the term *determinant* as in (6).

- (6) In a rule of the form
- $$A \rightarrow \left[\begin{array}{c} B \\ \alpha F \end{array} \right] / Y C X \text{ --- } Z$$
- or / Y --- X C Z
- C is a *determinant* if and only if it contains [αF] or [-αF] for some phonological feature F.¹

Even with the proviso that the Relevancy Condition is applicable

¹ In this study we assume that a determinant is a single segment, as appears to be the intent of Ringen's definition, although she does not specifically exclude determinants containing more than one segment. We leave the study of multisegmental determinants, as well as the problem of determinants on both sides of the focus (discontinuous determinants), to future research.

Note also that the term "phonological" in this definition must be taken literally, specifically excluding rules with grammatical conditioning from the domain of the Relevancy Condition.

only to those rules for which a determinant is clearly defined, the Relevancy Condition makes very strong claims about the nature of phonological grammars. These claims are falsifiable, and thus constitute a scientific hypothesis. Odden [14] has attempted to falsify the Relevancy Condition by adducing counterexamples. What we show here is that, of his seven proposed counterexamples, only two present serious difficulties for the Relevancy Condition: Karok *Palatalization* and Memomi *Mid Vowel Raising*. In the other cases, either Odden has misunderstood the Relevancy Condition, so that there is no difficulty at all, or else the rule in question can be reinterpreted in such a way that the Relevancy Condition constrains it as intended. Odden also raises some methodological problems with the concept of *overspecification*, or adding certain otherwise redundant features to the focus and/or determinant matrices in some rules. We take up this question in §4. We discuss Odden's two true counterexamples in §5, where we propose to reinterpret the condition as a measure of the markedness of rules, following certain recent proposals to consider rule ordering interactions, for example, in terms of markedness.

2. APPARENT COUNTEREXAMPLES

The first set of examples that Odden deals with are those for which the Relevancy Condition is too weak, i.e., segments that are specified by the condition as irrelevant nevertheless block the rule. These are the Sanskrit *Retroflexion* and Tunica *Vowel Assimilation*. Concerning the third case, Yawelmani *Vowel Harmony*, Odden has misunderstood the statement of the condition.

2.1 SANSKRIT RETROFLEXION

Sanskrit has a rule that retroflexes *n* to *ṅ* after *r*, *ṛ*, and *ṣ*, where any number of vowels, glides, labials, and velars can intervene. In Jensen [10], this rule is expressed as (7).

$$(7) \left[\begin{array}{c} +\text{cons} \\ -\text{syll} \\ +\text{nas} \\ +\text{cor} \end{array} \right] \rightarrow [-\text{anterior}] / \left[\begin{array}{c} +\text{cons} \\ +\text{cor} \\ -\text{ant} \\ -\text{nas} \\ +\text{cont} \\ -\text{lat} \end{array} \right] \left\{ \begin{array}{l} [-\text{cons}] \\ [-\text{cor}] \end{array} \right\}_0 \text{ --- } [-\text{obst}]$$

The focus and determinant of this rule share the features [+cons] and [+cor] and no others, the feature [+cons] being a major class feature. Notice further that the matrix [+cons, +cor, -ant, -nas, +cont, -lat] is a determinant by Ringen's criterion, since it shares the feature [-ant] with the structural change. Accordingly, the Relevancy Condition is applicable and states that the class of relevant segments is exactly that defined by the features common to the focus and determinant, namely [+cons, +cor]. Any member of the complement class, namely $\left\{ \begin{array}{l} [-\text{cons}] \\ [-\text{cor}] \end{array} \right\}$, is irrelevant and may freely intervene. In a theory incorporating the Relevancy Condition, the expression of the intervening segments is unnecessary and should be replaced by the variable X , where the possible members of X are restricted to the set of irrelevant segments.

Odden points out that this formulation is inadequate in that the true palatal obstruents, which are [+high, -back, -cor], block the rule, even though they are specified as irrelevant by the condition. This fact entails a considerable complication of the statement of rule (7) even without the Relevancy Condition. The intervening segments must be specified as in (8).

$$(8) \left\{ \begin{array}{l} [-\text{cons}] \\ \left[\begin{array}{l} -\text{cor} \\ +\text{ant} \end{array} \right] \\ \left[\begin{array}{l} -\text{cor} \\ -\text{ant} \\ +\text{high} \\ +\text{back} \end{array} \right] \end{array} \right\} \begin{array}{l} \text{(vowels and glides)} \\ \text{(labials)} \\ \text{(velars)} \end{array}$$

In a system using SPE features, the Relevancy Condition is too weak to specify the intervening material. Of the class of segments designated as irrelevant, only a subset can in fact intervene. This must be expressed either by specifying the intervening segments, as in (8), or by placing an additional condition on X in (7) such that it may contain no [+high, -back, -cor] segment, i.e. true palatals.

The rather unpleasant disjunction in (8) can be avoided by returning to the Jacobsonian feature *grave* instead of *coronal*. Notice that these two features are not quite complementary: all segments which are [grave] are [-coronal] except for the true palatals, which are [-grave] and [-coronal]. The feature *grave*, therefore, allows exactly the correct intervening environment to be specified as in (9).

$$(9) \left\{ \begin{array}{l} [-\text{cons}] \\ [+grave] \end{array} \right\}$$

With the feature *grave* replacing *coronal*, (7) can be rewritten as (10).

$$(10) \left[\begin{array}{l} +\text{cons} \\ -\text{syll} \\ +\text{nas} \\ -\text{grave} \\ -\text{high} \end{array} \right] \rightarrow [-\text{ant}] / \left[\begin{array}{l} +\text{cons} \\ -\text{grave} \\ -\text{ant} \\ -\text{nas} \\ +\text{cont} \\ -\text{lat} \end{array} \right] \left\{ \begin{array}{l} [-\text{cons}] \\ [+grave] \end{array} \right\}_0 \text{---} [-\text{obst}]$$

(10) is the form in which Zwicky [21] stated this rule using pre-SPE features. In this formulation, the intervening material is exactly that specified by the Relevancy Condition, as can easily be verified. It would seem that the difficulty with this rule lies not in the Relevancy Condition, but in the feature system used to express the rule. The correct universal feature system is an empirical question which must be determined independently of the Relevancy Condition. However, in view of a number of recent suggestions to reincorporate *grave* into the feature system, e.g. Hyman [9], it does not seem unreasonable to suggest this modification in the case of Sanskrit *Retroflexion*.

2.2 TUNICA VOWEL ASSIMILATION

Odden discusses a rule of Tunica that assimilates a to ϵ immediately after one of the front vowels e , i , or ϵ ; and to ? immediately after one of the round vowels o , u , or ? . This rule also applies if a glottal stop intervenes between the determinant and focus. The formal statement of the rule is provided in (11).

$$(11) \left[\begin{array}{l} +\text{syll} \\ +\text{low} \end{array} \right] \rightarrow \left[\begin{array}{l} \text{around} \\ \text{aback} \end{array} \right] / \left[\begin{array}{l} +\text{syll} \\ \text{around} \\ \text{aback} \end{array} \right] \text{---} \text{?}$$

Since (11) is an assimilation rule by Ringen's criterion, the Relevancy Condition is applicable. Examination of the focus and determinant reveals only the feature [+syll] in common. Therefore, all nonsyllables should be able to intervene. But only glottal stop may intervene, as the statement of the rule shows. Thus the optional glottal stop in the environment cannot be replaced by X .

This is another case where the Relevancy Condition is too weak to predict the nature of the intervening material. Only a subclass of the nonsyllabics, in fact only glottal stop, may intervene. The Relevancy Condition was devised as a constraint on intervening material in phonological rules. *It does not state that rules may not be further restricted than the condition predicts.* We may therefore assume that (11) is the correct statement of Tunica Vowel Assimilation and that it is entirely consistent with the Relevancy Condition. It is not the case that the optional glottal stop in the environment '*must,' counterfactually, be replaced by the variable *X*, as Odden assumes. An intervening environment is replaced by *X* only when its contents are correctly predicted by the Relevancy Condition. The claim embodied in the Relevancy Condition is that a rule will never cross relevant segments. However, rules may be further restricted in such a way that they also do not cross certain irrelevant segments.

2.3 YAWELMANI VOWEL HARMONY

Odden writes the rule for Yawelmani Vowel Harmony as (12).

$$(12) \begin{bmatrix} +\text{syll} \\ \text{ahigh} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{round} \\ +\text{back} \\ -\text{low} \end{bmatrix} / \begin{bmatrix} +\text{syll} \\ +\text{round} \\ \text{ahigh} \end{bmatrix} C_0 \text{---}$$

In discussing this formulation, he remarks:

Since the determinant and focus have in common the features [+syll, ahigh], the Relevancy Condition predicts that consonants and vowels which differ in height from the determinant vowel and focus vowel are irrelevant, and thus can intervene. However, this is not the case, because no vowels can intervene . . . [14: 180] (emphasis added)

This statement reflects a misunderstanding of the Relevancy Condition. In particular, features with Greek-letter variable specification are never counted as common features. To see why, we must look again at the definition of relevant segments given in (4). We may restate the definition slightly differently, and perhaps more formally, as in (13).

- (13) Given any phonological rule which has a determinant as defined in (6), and which has at least one major class feature common to the focus and determinant, construct a feature matrix containing all and only the features common to the focus and determinant of the rule. The class of segments defined by the matrix so constructed is the class of segments relevant to the rule.

If we apply procedure (13) to rule (12), we obtain the matrix $\begin{bmatrix} +\text{syll} \\ \text{ahigh} \end{bmatrix}$ as Odden notes. The variable *a* is understood as ranging over + and -, by the usual convention. The class of relevant segments is thus the class of all syllabics which are either [+high] or [-high], that is, all vowels.

3. VOWEL HARMONY

Two more of Odden's examples involve rules of vowel harmony: Khalkha Mongolian and Eastern Chereemis. It is particularly instructive to examine these cases carefully, since the Relevancy Condition was originally designed to deal with cases of this type. It has been assumed since the earliest work on "adjacency" conditions in phonology that vowel harmony rules operate on adjacent segments in a way made precise by the definition of the conditions. Rules of vowel harmony may operate across vowels in a particular language only if these vowels are neutral vowels. Which vowels are neutral for a particular language can be determined only by a thorough analysis of the language in question. An analysis of the vowel system in the light of such an analysis may result in conclusions that do not correspond to traditional analyses. For example, it is well known that *i* and *e* function as neutral vowels with respect to Finnish vowel harmony. In terms of a precise formulation of the Finnish vowel harmony rule, they are also irrelevant segments by the definition of the Relevancy Condition [10]. In Hungarian, a related language, it is widely assumed that these same vowels *i* and *e* are neutral. However, a careful analysis shows that this is not the case [11]. The vowels *i* and *e* are true front harmonic vowels in Hungarian. It turns out that there are no neutral vowels in Hungarian, although phonetic forms appear to have neutral vowels as a result of a rule of *Absolute Neutralization*, which merges *i* and *e* with their abstract back counterparts *ɨ* and *ʌ*. This latter rule makes the vowel harmony rule partially opaque in the sense of Kiparsky [13].

3.1 KHALKHA MONGOLIAN

Odden analyzes Vowel Harmony in Khalkha Mongolian as a rule that applies across a neutral vowel *i*, which is furthermore not irrelevant by the Relevancy Condition. We shall first review the pertinent facts before evaluating his proposal. Khalkha Mongolian has the underlying vowel system (14).

- (14) $\begin{matrix} i & \bar{i} & \bar{u} & \bar{u} \\ e & \bar{e} & \bar{o} & \bar{o} \end{matrix}$ $\begin{matrix} u & \bar{u} \\ o & \bar{o} \end{matrix}$ $\begin{matrix} a & \bar{a} \end{matrix}$

Suffixes with a high round vowel have alternant forms in short or long $-u$ or $-ü$. Nonhigh vowel suffixes have four alternant forms: short or long $-e$ -, $-a$ -, $-ö$ -, or $-o$ -. Suffixes in $-i$ - and $-ī$ - are invariant. The rule of vowel harmony selects the suffix alternant whose vowel corresponds in backness to the stem vowels. A rule of rounding harmony rounds a nonhigh vowel after a nonhigh round vowel (o or $ö$). For example, verbs of permission or causation are formed with the suffix $-ül$ - $hül$ -, which is distributed by vowel harmony as in (15).²

- (15) a. $alül$ 'allow or cause to kill' from ala - 'kill'
 b. $xelül$ 'allow to say' from $xele$ - 'say'
 c. $rölül$ 'allow to count' from $rāho$ - 'count'
 d. $bölül$ 'allow to act as shaman' from $böl$ - 'act as shaman'

A second example is the instrumental suffix, which has four forms: $-ār$ -, $-ēr$ -, $-ōr$ -, and $-ō̄r$ -. It is distributed as in (16).

- (16) a. $garār$ 'with the hand' from gar 'hand'
 b. $gerēr$ 'with the house' from ger 'house'
 c. $ōsorōr$ 'with the tape' from $ōsor$ 'tape'
 d. $xölör$ 'with the foot' from $xöl$ 'foot'

If the instrumental suffix has an underlying unround vowel, only Vowel Harmony applies in (16a-b), while both Vowel Harmony and Rounding Harmony apply in (16c-d).

The vowel i , the neutral vowel of Khalkha Mongolian, does not undergo Vowel Harmony. For example, the accusative suffix $-ig$ follows both back-vowel and front-vowel stems, round and unround, as in (17).

- (17) a. $garig$ 'hand (acc.)' from gar 'hand'
 b. $gerig$ 'house (acc.)' from ger 'house'
 c. $usig$ 'water (acc.)' from usa 'water'
 d. $xinig$ 'man (acc.)' from $xinig$ 'man'

² In examples (15a-c), another rule operates to delete the final vowel of a verb stem before the vowel of the suffix. This process does not affect the problem at hand.

³ The alternation between n and g in the forms of 'man' is the result of another rule, which Poppe [16:28] explains as follows: "Im absoluten Wortauslaut kommt n nicht vor, statt dessen wird ein g gesprochen."

Likewise, the abstract noun formative $-lig$ occurs with any stem, as in (18).

- (18) a. $bajalig$ 'wealth' from $baja$ 'wealthy'
 b. $isetseglig$ 'flower garden' from $isetseg$ 'flower'

The vowel i also does not condition harmony, and word-internal i is transparent to vowel harmony, as we see in (19), illustrated with the plural suffix, whose four alternants are $-iar$ -, $-ner$ -, $-nor$ -, and $-nōr$.

- (19) a. $axanar$ 'elder brothers' from axa 'elder brother'
 b. $dzēner$ 'sister's children' from $dzē$ 'sister's child'
 c. $atšinar$ 'grandsons' from $atši$ 'grandson'
 d. $tegniner$ 'gods' from $tegnri$ 'god'

When i is the first vowel in a root, it conditions harmony neither in the root nor in any suffixes, which agree with a preceding harmonic vowel, as shown in (20).

- (20) a. $jilā$ 'gnat' $jilānar$ 'gnats'
 b. $bije$ 'body' $bijenēr$ 'bodies'

However, if i is the only vowel in a root, suffixes attached to the root have front vowels, as in (21).

- (21) $džilēr$ 'with the year (instrumental)' from $džil$ 'year'

The neutral vowel i seems to play a role in vowel harmony only in (21), where it appears to condition front-vowel suffixes. Note that we need to claim that i determines harmony in (21) only if we assume that suffix vowels are back in underlying form and that Vowel Harmony is a fronting rule. Making this assumption, Odden writes rule (22) (=Odden's (311)) to account for vowel harmony.⁴

- (22) $[+syll] \rightarrow \left[\begin{matrix} -back \\ -low \end{matrix} \right] / \left[\begin{matrix} +syll \\ -back \end{matrix} \right] (C_0 \left[\begin{matrix} +syll \\ +high \\ -round \end{matrix} \right])_0 C_0$

Odden assumes that alternating suffixes have underlying back vowels:

⁴ We have amended Odden's formulation slightly by eliminating the feature [+back] in the input, which is unnecessary since it indicates a vacuous application. Even with this change, Odden's rule does not conform to the Relevancy Condition.

a and *u*. Invariant suffixes in *i* have the underlying vowel *i*. Since *i* acts as a determinant for (22), this rule derives (21) from underlying *dʒil + ar*. But allowing *i* to act as a determinant has undesirable consequences for (20). If (22) applies to *jilā* (=20a), it will derive the wrong form **jilē*. To prevent this, (22) must be restricted from applying within roots by inserting a + boundary before C_0 ____. Harmony within roots, which is otherwise general in Khalkha, would have to be accounted for by a separate morpheme structure rule or condition in this analysis.

By the Relevancy Condition, all vowels are relevant to (22); thus no vowels can intervene. This is an incorrect prediction, since *i* can intervene in vowel harmony.

However, we need not assume that suffix vowels are back underlyingly. In fact, since no alternating suffix is used as a stem, there is no independent evidence for the underlying value of suffix vowels. Suppose we assume that suffixes have front vowels, *e* and *i*, in underlying form. Then Vowel Harmony can be stated as a backing rule as in (23).

$$(23) \left[\begin{array}{c} +\text{syll} \\ \left\{ \begin{array}{l} [+round] \\ \{-high\} \end{array} \right\} \end{array} \right] \rightarrow \left[\begin{array}{c} +\text{back} \\ \langle +\text{low} \rangle \end{array} \right] / \left[\begin{array}{c} +\text{syll} \\ +\text{back} \end{array} \right] \left(C_0 \left[\begin{array}{c} +\text{syll} \\ +\text{high} \\ -\text{round} \end{array} \right] \right)_0 C_0 \text{---}$$

The features in curly brackets in the input are needed to exclude *i*, which will not be affected by (23) in cases like (17) and (18). The features in angled brackets determine the alternation of *e* with *a*, as in (16). If *i* is the only vowel in the root, the suffix remains front, as in (21). We need not further complicate (23) to avoid deriving incorrectly harmonized roots in forms such as (20), since *i* does not serve as determinant in (23).

From the rule as stated in (23), the Relevancy Condition cannot predict the possibility of an intervening neutral vowel, since the input and determinant share no major class features. It is possible to modify (23), however, by adding two redundant features to the determinant, as in (24), since all back vowels in Khalkha are either round or non-high.

$$(24) \left[\begin{array}{c} +\text{syll} \\ \left\{ \begin{array}{l} [+round] \\ \{-high\} \end{array} \right\} \end{array} \right] \rightarrow \left[\begin{array}{c} +\text{back} \\ \langle +\text{low} \rangle \end{array} \right] / \left[\begin{array}{c} +\text{syll} \\ +\text{back} \\ \left\{ \begin{array}{l} [+round] \\ \{-high\} \end{array} \right\} \end{array} \right] X \text{---}$$

The input and determinant now have in common the features in (25).

$$(25) \left[\begin{array}{c} +\text{syll} \\ \left\{ \begin{array}{l} [+round] \\ \{-high\} \end{array} \right\} \end{array} \right]$$

The complement to (25) is just the neutral vowel *i*, that is [+syll, -round, +high], and the nonsyllabics. Since these segments, defined as irrelevant by the Relevancy Condition, are just the segments that can intervene in Vowel Harmony, we can replace the specified intervening material in (23) by *X*.

The addition of redundant features has made it possible to predict the intervening environment in Vowel Harmony by the Relevancy Condition. Even with these additional features, rule (24) is simpler than Odden's rule (22) by two symbols. (We include in this feature count the + boundary that must be added to (22) to account for the forms in (20).) Furthermore, (24), which applies both within and across + boundaries, effects a simplification of the morpheme structure component since no morpheme structure condition is needed to account for vowel harmony within roots. Thus, although we use the device of adding redundant features to a rule, we effect a net simplification of the grammar of Khalkha Mongolian in two ways.⁵

We have developed rule (24) by assuming that suffix vowels are front in underlying form. To support the opposing claim that suffix vowels are back in underlying form, Odden cites two suffixes that would be exceptions to the backing rule (24) but which are not exceptional to his fronting rule (22). The past tense suffix *-dʒɛɛ* is invariable under vowel harmony (Street [20:10, 68]), as we see in (26).⁶

- (26) a. *irdʒɛ* 'he came' from *ir* - 'come'
 b. *jawdʒɛ* 'he went' from *jaw* - 'go'

⁵ Jensen [11] presents a similar argument for vowel harmony in Hungarian.

⁶ We have normalized the varying transcriptions to agree with that used in Poppe [16]: the symbol / indicates a palatal glide and *w* a voiced labio-dental fricative; the other symbols are self-explanatory. Poppe [16:80] represents the past tense suffix as *-dʒɛɛ*, with a neutral vowel and labels it "Praetertium imperfecti." Under emphatic stress, this suffix has the form *-dʒɛ̃ɛ̃*. In Poppe's account, the past tense suffix is not exceptional to vowel harmony, since it has an underlying neutral vowel. The emphatic form is derived by a later rule: The past tense suffix described by Street is exceptional to rounding harmony as well as to vowel harmony: *hɔs-dʒɛɛ* 'get up (past)'. This double rounding harmony suggests that an underlying *-dʒɛɛ* works for Street also, and that this is lowered to *-dʒɛ̃ɛ̃* after both vowel harmony and rounding harmony. In this dialect too, the mid vowel of the past tense suffix is lowered under emphatic stress to *e* (Street [20:54]).

The negative suffix *-güi* also fails to undergo vowel harmony, as (27) shows.

- (27) a. *irexegüi* 'will not come' From *ire-* 'come', *-xe-* 'future'
 b. *lawisangüi* 'have not placed' From *tanri-* 'place, lay', *-sag-* 'perfect'

In Odden's analysis, neither of these suffixes needs to be marked as an exception to Vowel Harmony, since his rule applies vacuously to front vowels. Since the suffixes would have to carry exception markings in our backing rule analysis, Odden's rule appears to result in a simpler grammar.

However, this claim depends on Odden's assumption that there are no back-vowel exceptions to Vowel Harmony. A back-vowel exception will have to be marked as such in Odden's theory, just as a front-vowel exception must be marked in our theory. Back-vowel exceptions to Vowel Harmony do exist in Khalkha Mongolian. The first and second person plural possessive suffixes *-man* 'our' and *-tan* 'your' fail to obey Vowel Harmony, as shown in (28).

- (28) a. *axaman* 'our elder brother' from *axa* 'elder brother'
 b. *axatan* 'your (pl.) elder brother' from *ger* 'house'
 c. *german* 'our house' from *ger* 'house'
 d. *geritan* 'your (pl.) house'
 e. *egestiġan* 'your (pl.) elder sister' from *egestiġi* 'elder sister'

The emphatic particle *dā* likewise has no front-vowel form, as we see in (29).

- (29) *xetsü-dā* 'it is indeed difficult'

Since there are exceptions to Vowel Harmony in either theory, exceptionality does not provide a basis for choosing between theories.⁷

A second rule in Khalkha Mongolian cited by Odden as problematic for the Relevancy Condition is *Rounding Harmony*. This rule rounds

⁷ The exceptionality of some of these suffixes may be due to their use as stems in Khalkha Mongolian. The negative particle *-güi* is a reduced form of *ügei* 'not', which occurs apparently in free variation:

- (i) *irġigei* 'has not yet come' from *ire-* 'come',
irġ-güi 'has not yet come' *-irġi-* 'perfect'

When used as a stem, the negative particle conditions harmony:

a nonhigh vowel after a nonhigh round vowel *o* and *ö*. Rounding Harmony applies across *i*, as seen in (30e).⁸

- (30) *-ās / -ēs / -ös / -ōs* Ablative suffix
 a. *axās* 'from the elder brother' from *axa* 'elder brother'
 b. *diğās* 'from the younger brother' from *dū* 'younger brother'
 c. *bolğos* 'from the shaman' from *bō* 'shaman'
 d. *nojonos* 'from the prince' from *nojon* 'prince'
 e. *morinos* 'from the horse' from *morin* 'horse'

However, the rule is blocked by a high round vowel *u* or *ü*, as (31) shows.

- (31) a. *tölöd* 'having counted' from *töl-* 'count', *-öd / -öd / -äd / -öd* 'perfective participle'
 b. *tölüäd* 'since he caused to count' from *-äl / -äl / -äl-* 'causative'
 c. *bölöd* 'having acted as shaman' from *böl-* 'act as shaman'
 d. *bölülöd* 'since he caused to act as shaman'

- (ii) *jawaxa-güü* 'Will one not go?' from *jawa-* 'go', *-rü-* 'future', *-rü-* 'question'

To account for (ii), *ügei* is marked as a context for Vowel Harmony (I+Context VHI). Its failure to serve as an input to harmony may be indicated either by a stronger boundary preceding the negative suffix, or by a rule exception feature [I-Input VHI]. As well as being a possessive suffix, *man* is the stem for the first person plural exclusive form of the personal pronoun:

- (iii) a. *manā* 'of us' (genitive)
 b. *manda* 'to us' (dative-locative)
 c. *manġi* 'us' (accusative)

Tan serves as stem for the second person plural personal pronoun:

- (iv) a. *tanā* 'of you' (genitive)
 b. *tanda* 'to you' (dative)
 c. *tanġi* 'you' (accusative)

Again, the exceptionality of *-man* and *-tan* used as possessive suffixes may be marked by a stronger boundary between the stem and the suffix. If these suffixes undergo Rounding Harmony when affixed to stems such as *datoro* 'inside', the boundary solution will have to be given up in favor of the exception feature solution. Unfortunately, we have no data that would decide this question.

The theoretical device used to indicate exceptionality must be chosen on the basis of a more thorough analysis of the language. But the fact remains that the exceptionality of these affixes must be accounted for in any theory.

⁸ In (30b, c) another rule inserts *g* to break up the sequence of vowels resulting from the addition of a vowel initial suffix to a stem ending in a long vowel or diphthong.

Odden states the rule that rounds *a* to *o* and *e* to *ö* (short and long) as in (32) (=Odden's 36).

$$(32) \text{ Rounding Harmony} \\ \left[\begin{array}{c} +\text{syll} \\ -\text{high} \end{array} \right] \rightarrow \left[\begin{array}{c} +\text{round} \\ -\text{low} \end{array} \right] / \left[\begin{array}{c} +\text{syll} \\ -\text{high} \\ +\text{round} \end{array} \right] (C_0 \left[\begin{array}{c} +\text{syll} \\ +\text{high} \\ -\text{round} \end{array} \right])_0 C_0 \text{---}$$

Since the determinant and focus share the features [+syll, -high], the Relevancy Condition predicts that nonhigh vowels, which are the relevant segments, do not intervene. It makes no such prediction about the class of irrelevant segments, namely consonants and high vowels. Since *u* and *ü* cannot intervene, the irrelevant segments that can intervene, namely consonants and *i*, must be specified in the rule.

Rounding Harmony in Khalkha Mongolian is in this respect like Tunica *Vowel Assimilation* (§2.2). In both cases, only a subset of the segments specified as irrelevant by the Relevancy Condition may in fact intervene. Here again we see that the Relevancy Condition specifies only the possibility, not the necessity, that irrelevant segments will intervene in a rule. The interesting prediction made by the Relevancy Condition in Rounding Harmony is that *i* will not block the rule, whereas *e* and *a*, relevant segments, will block the rule. This would not be expected a priori. Rounding Harmony is in general conditioned by the vowel of the syllable immediately preceding the focus vowel, and all three of these vowels (*i*, *e*, and *a*) are nonround. In a theory without the Relevancy Condition, the fact that *e* and *a*, but not *i*, block the rule is accidental. The Relevancy Condition provides a principled basis for this phenomenon.

3.2 EASTERN CHEREMIS

Odden considers vowel harmony in Eastern Chermis a counter-example to the Relevancy Condition on the basis of a number of forms which in phonetic representation seem to violate the condition. However, the Relevancy Condition is not refuted simply by the existence of surface forms which do not conform to it. Unlike the conditions of Kiparsky [13] relating rules to surface forms, the Relevancy Condition is a constraint on rules of phonology. In order to show that a particular rule is a true exception to the Relevancy Condition, it is often necessary to look at a fairly significant fragment of a grammar, which Odden

has not done for vowel harmony in Eastern Chermis. By examining the relationship of Vowel Harmony to a number of other rules of Chermis phonology, we will show that, while the vowel harmony rule shows surface violations of the Relevancy Condition, the application of the rule itself conforms to the Relevancy Condition.

Eastern Chermis has a rather restricted process of vowel harmony. This process affects some suffixes with mid vowels *e*, *a*, and *ö*, such as the third person singular past personal suffix *-e/-ö/-a*. According to Sebeok and Ingemann [18], the alternant with *o* is selected after the back round vowels *u* and *o*; the alternant with *ö* is selected after the front round vowels *ü* and *ö*; and the alternant with *e* is selected after any other vowel, i.e., *i*, *e*, *a*, and *ɔ*. The determining vowel is always the immediately preceding vowel, unless that vowel is *ɔ*, in which case the next preceding vowel serves as the determinant. Only if there is no other vowel before the focus vowel to determine the harmony does *ɔ* itself act as the determinant.

This description can be greatly simplified by making certain plausible assumptions about the underlying form of the harmonic suffixes. If the underlying form contains *e*, there is no necessity to consider any but round vowels as determinants. Allowing for intervening *ɔ*, Odden writes the rule as (33).

$$(33) \text{ Vowel Harmony (preliminary formulation)} \\ \left[\begin{array}{c} +\text{syll} \\ -\text{high} \\ -\text{back} \end{array} \right] \rightarrow \left[\begin{array}{c} +\text{round} \\ \text{aback} \end{array} \right] / \left[\begin{array}{c} +\text{syll} \\ +\text{round} \\ \text{aback} \end{array} \right] (C_0 \left[\begin{array}{c} +\text{back} \\ +\text{syll} \\ -\text{low} \\ -\text{round} \end{array} \right])_0 C_0 \text{---}$$

As Odden notes, the rule so formulated violates the Relevancy Condition. The determinant and focus have in common only the feature [+syll], which makes all vowels relevant segments. Therefore no vowel should be allowed to intervene, as *ɔ* apparently does.

From the description so far, it might appear that *ɔ* is a neutral vowel in Eastern Chermis vowel harmony. There might be some support for this position. Sebeok and Ingemann speak of *ɔ* as a reduced vowel and of the other vowels as full vowels. The reduction of schwa has consequences for stress patterns. Stress normally falls on the final vowel of a word. But in words containing harmonic suffixes, like those that alternate as indicated above, the stress may optionally retract to the nearest preceding full vowel, or if there is none, onto the first vowel. Some possible patterns are illustrated in (34).

- (34)
- | | | | |
|----|-----------|-----------|-------------------|
| a. | piré | piré | 'wolf' |
| b. | opašte | opašte | 'door' |
| c. | kišam | kišam | 'his hand (acc.)' |
| d. | pügalmo | pügalmo | 'cone' |
| e. | kídaštaže | kídaštaže | 'in his hand' |
| f. | tálazän | talazän | 'moon's' |

This stress patterning can be predicted by the two rules (35) and (36).

- (35) Final Stress
 $V \rightarrow [+stress] / \text{---} C_0 \#$ Obligatory

- (36) Retraction

$$V \rightarrow [+stress] / \text{---} (C_0 \begin{bmatrix} +back \\ +syll \\ -low \\ -round \end{bmatrix})_0 C_0 \begin{bmatrix} +syll \\ -high \\ -low \end{bmatrix} C_0 \#$$

Optional

Despite the evidence of stress, there are certain difficulties with the assumption that *a* is the neutral vowel in Eastern Cheremis. First, in most vowel harmony systems with neutral vowels, all vowels except neutral vowels participate in harmony as both determinants and as foci. In Eastern Cheremis, however, not only *a* but also *i* and *o* are completely outside the harmony system. Second, the reduced nature of *a* results in many cases from a reduction from the other mid vowels *o*, *ö*, and *e*, as will be carefully documented in the next section. What is indicated is an alternative solution in which no intervening *a* is present at the time Vowel Harmony applies.

In order to conclude that vowel harmony in Cheremis conforms to the Relevancy Condition, it will be necessary to show that the schwas that intervene in harmony are derived, that is, that they are not present at the time of the application of the rule. In fact, Odden notes the possibility that all such schwas may be epenthetic, but dismisses this possibility in a footnote:

One reader has suggested the possibility that all of these schwas are epenthetic, based on the fact that most of them appear in the environment CC___C. Schwa does appear in the environment VC___CV in *todap^{ho}*, *todalatam* 'I break' and many other forms where it could not be epenthetic. Further, no epenthetic schwa appears [sel] to break up a cluster in *pörsö* 'his house', *pörina* 'our house', or *pörtbak* 'houses'. This makes it impossible to formulate a schwa-

epenthesis rule, which is desirable, since there are no schwa- ϕ alternations in Cheremis (except as a result of a general rule deleting a vowel after a vowel). [14:184]

There are two comments to make in response to this remark. First, there is no general rule that deletes a vowel after a vowel. Many VV combinations remain, as in *pasueš* 'in the field'. Schwa is deleted *before* another vowel, as in (37).

- (37) a. korna-žo 'his way'
 b. korn-et 'your way'

This alternation requires the rule (38), whose input is restricted to *a*.

- (38) $a \rightarrow \phi / \text{---} + V$

A second vowel-zero alternation involves the vowel *e*, which is deleted *after a*. This alternation is shown in (39).

- (39) a. pört-em 'my house'
 b. ača-m 'my father'

The rule accounting for this alternation is (40).

- (40) $e \rightarrow \phi / a + \text{---}$

In the third rule of vowel deletion, a vowel is deleted before an identical vowel. The rule for this is (41).

- (41) $V \rightarrow \phi / \text{---} [aF] V$
 $[aF] \rightarrow \phi / \text{---} [aF]$

Other than these cases, vowel sequences remain. There is no general rule of vowel deletion, as Odden claims.

The second, and more serious, point is that Odden assumes that if the appearance of schwa between harmonizing vowels were accounted for by rule, it would have to be a single rule, which in turn would have to be an epenthesis rule. It is an empirical question, independent of the issue concerning the Relevancy Condition, how many rules and what type of rules are involved in such alternations. It can easily be shown that many cases of schwa between harmonizing vowels are reductions from full vowels. Sebeok and Ingemann [18:10] state the

rule as: "Both stem final and suffix final /e, o, ö/ which are in harmony with preceding vowels are replaced by *ɤ* before a suffix." The data of (42) support this rule.

- (42)
- | | | |
|----|-------------|-----------------|
| a. | kobašte | 'fur, skin' |
| b. | kobašta-že | 'its fur' |
| c. | surtiško | 'to the house' |
| d. | surtiška-žo | 'to his house' |
| e. | körgö | 'inside' |
| f. | körga-štö | 'in the inside' |

We can state Sebeok and Ingemann's rule formally as (43).

- (43) Mid Vowel Reduction
- $$\begin{bmatrix} +\text{syll} \\ -\text{high} \\ -\text{low} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{back} \\ -\text{round} \end{bmatrix} / \text{---} +$$

At this point we may reconsider the Vowel Harmony rule. The example of (42) shows that at least some of the schwas that intervene between determinant and focus in phonetic forms are reduced from full harmonic vowels. Anticipating for a moment the results of the discussion of the following section, we assume that Vowel Harmony never crosses any vowel. Under this assumption, the rule can be restated as (44).

- (44) Vowel Harmony (revised)
- $$\begin{bmatrix} +\text{syll} \\ -\text{high} \\ -\text{back} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{round} \\ \text{oback} \end{bmatrix} / \begin{bmatrix} +\text{syll} \\ +\text{round} \\ \text{oback} \end{bmatrix} C_0 \text{---}$$

In this form the rule conforms to the Relevancy Condition, and we may replace the C_0 in the environment statement by the variable X , which by the Relevancy Condition can contain only consonants. With Vowel Harmony (44) ordered before Mid Vowel Reduction (43), *körgaštö* 'in the inside' (=42f) is derived as in (45).

- (45) /körgö + šte/ (/körgö/ 'inside', /šte/ 'in')
- | | | |
|----------|---|--------------------------|
| a | ö | Vowel Harmony (44) |
| | | Mid Vowel Reduction (43) |
| körgaštö | | output 'in the inside' |

Contrary to Odden's assumptions, there are a number of schwa-zero alternations in Chereemis that cannot be explained by a simple rule deleting vowels after vowels. We will present a number of examples to show that these alternations are conditioned by a complex of morphological and phonological factors. In effect, each suffix of this type requires its own statement of the distribution of schwa.

We will consider first the third person singular possessive suffix. This morpheme has the allomorphs of (46).

- (46)
- | | | | | |
|-------|-----|------|----|------|
| -aže | -až | -že | -ž | -še |
| -ažo | | -žo | | -šo |
| -ažö | | -žö | | -šö |
| -aža- | | -ža- | | -ša- |

The alternation in the final vowel is accounted for by Vowel Harmony (44). The alternation between \dot{s} and \dot{z} is due to a general rule which assimilates an obstruent in voicing to a preceding obstruent. The forms with final schwa are derived by the rule of Mid Vowel Reduction (43) already discussed. According to Sebeok and Ingemann, "the allomorphs beginning with /a/ occur primarily after /š/: *jolaš-a že* 'his friend' " [18:11]. From this description we may postulate an epenthesis rule (47), which is possibly morphologically conditioned.

- (47) $\phi \rightarrow a / \dot{s} \text{---} \dot{z}$

Finally, the forms without a final vowel are derived by the rule of *Schwa Deletion* (38), for example (48).

- (48) *ača-ž-at* 'his father (emphatic)'

From this discussion we conclude that the underlying form of the third person singular possessive suffix is $\dot{z}e$.

Other schwa-zero alternations likewise appear to be morphologically conditioned. One derivational suffix of this type is *-a/ -l*, which has a variety of meanings in the examples of (49).

- (49)
- | | | | | |
|----|-------------------------|------------|----------------------|--|
| a. | pört-al-am | 'I return' | from <i>pörtam</i> | 'I turn' |
| b. | tod-al-al-t-am | 'I break' | from <i>todeštam</i> | 'I break' |
| c. | tod-al-am | 'I break' | | |
| d. | pört-al ^e -ö | 'return' | | <i>-e/ -o/ -ö</i> third singular past personal |

According to Sebeok and Ingemann, the *-al* form occurs after *-am* verb stems ending in a consonant other than *r*; the *l* form occurs elsewhere. We can assume another epenthesis rule, operating in a partially morphological environment, to produce the *al* form, given as (50).

$$(50) \quad \phi \rightarrow a / C \text{ — } +1$$

Conditions: $C \neq r$

C belongs to an *am* stem verb
 l is the passive or reflexive morpheme

The inverse of (50) would be a deletion rule such as (51).

$$(51) \quad a \rightarrow \phi / \left\{ \begin{array}{l} V \\ r \end{array} \right\} \text{ — } +1$$

In a deletion analysis, additional deletion rules would be required for other suffixes that show schwa-zero alternations, since the environments for these alternations overlap only partially with that of rule (51). One such suffix, the causative suffix *-ktl* *-akt*, is distributed as in (52). After a vowel, *-ktl* generally occurs; *-akt* appears after a consonant and some monosyllabic stems ending in a vowel. Data are from Sebeok and Ingemann [18:16].

(52)	a.	ci-kt-em	'I clothe'	from <i>ciem</i>	'I wear'
	b.	ara-kt-em	'I cook'	from <i>arem</i>	'I get hot'
	c.	tun-akt-em	'I teach'	from <i>tunemam</i>	'I learn'
	d.	era-kt-em	'I clean'	from <i>ere</i>	'I clean'
	e.	olma-cta-l-am	'I repair'	from <i>olmo</i>	'place'

These examples suggest a deletion rule of the form (53).

$$(53) \quad a \rightarrow \phi / \# C_0 V (C_0 V)_0 C_0 V \text{ —}$$

Rule (53) cannot be collapsed with rule (51). In general, as more and more data from Sebeok and Ingemann [18] are examined, each suffix showing this alternation would require a separate rule. This is true under either an insertion or a deletion hypothesis. We can conclude that neither insertion nor deletion is, a priori, less complex than the other. Accordingly, we look to the Relevancy Condition to select between these rival analyses.

It is evident from (49d) that Vowel Harmony applies to suffixes that follow *ahl*. To account for this in the approach to Vowel Harmony that incorporates the Relevancy Condition, we must order Vowel Harmony before the Epenthesis rule (50). The resulting grammar is in any case simpler than the one that Odden appears to advocate, since we need not refer to the possibility of intervening vowels in the Vowel Harmony rule, as any theory that determined the distribution of the allomorphs *-ahl* *-l* before Vowel Harmony would be forced to do. Furthermore, it is evident that the theory that posited an underlying *al* for this suffix would encounter just as much difficulty in the rule for the deletion of schwa as our theory encounters in the insertion rule.

There are a number of other suffixes in which schwa appears in one allomorph and not in another. For each suffix there is a unique distribution of allomorphs. These facts can be handled, though not elegantly, in our theory in which there are morphologically dependent schwa insertion rules ordered after Vowel Harmony. In no case is this theory any less elegant than Odden's, which would rely on equally complex morphologically dependent schwa deletion rules. Because of its simpler Vowel Harmony rule, our theory is to be preferred to Odden's on grounds independent of the Relevancy Condition. The fact that the simpler theory is in conformity with the Relevancy Condition merely confirms our analysis.

4. OVERSPECIFICATION

The predictions made by the Relevancy Condition are not always the result of the most general formulations of a rule. In Latin, there is a rule that converts *l* of the suffix *-ālis* to *r* if there is a lateral earlier in the word. An informal statement is (54).

$$(54) \quad l \rightarrow r / l X \text{ —}$$

Conditions: X contains no liquids
 l of the input belongs to *-ālis*

This rule accounts for such data as are in (55).

(55)	a.	navālis	'naval'	from <i>navis</i>	'ship'
	b.	militālis	'military'	from <i>miles</i>	'soldier'
	c.	lunālis	'lunar'	from <i>luna</i>	'moon'
	d.	lupānālis	'whorish'	from <i>lupānar</i>	'brothel'
	e.	liberālis	'liberal'	from <i>liber</i>	'free'

The formal statement of this rule, based on the feature system of SPE, in which the major class features are *consonantal* and *vocalic*, is (56).

$$(56) \begin{bmatrix} +\text{cons} \\ +\text{voc} \end{bmatrix} \rightarrow [-\text{lat}] / \begin{bmatrix} +\text{cons} \\ +\text{voc} \\ +\text{lat} \end{bmatrix} X \text{ ---}$$

Given (56), the Relevancy Condition predicts the condition that was imposed arbitrarily in (54) that *X* contain no liquids. The class of relevant segments is defined by the features common to the determinant and focus, namely [+cons, +voc], which is just the class of liquids. Thus no arbitrary condition on *X* is imposed in (56).

In SPE it is noted that a preferable feature system would contain the feature *syllabic* instead of *vocalic* to account, among other things, for the syllabic sonorant consonants of many languages. Latin *Liquid Dissimilation* in this framework is formulated in (57).

$$(57) [-\text{lat}] \rightarrow [-\text{lat}] / [+lat] X \text{ ---}$$

Condition: *X* contains no liquids

Notice that (57) does not conform to the Relevancy Condition. Since there are no major class features in common between the focus and determinant, this formulation predicts that *X* must be null, that there can be no intervening material. Even if the requirement of a common major class feature were removed, (57) would allow all nonlaterals to intervene, which is incorrect, since *r* must also not intervene, as shown by (55e).

It is possible to build the condition on (57) into the statement of the rule itself in two ways. One is by using the class complement notation introduced by Zwicky [22]. The result is (58).

$$(58) [-\text{lat}] \rightarrow [-\text{lat}] / [+lat] \text{ ---} \begin{bmatrix} -\text{syll} \\ +\text{cons} \\ +\text{son} \\ -\text{nas} \end{bmatrix} \text{ ---}$$

The class complement in (58), which specifies any number of nonliquids as possible intervening material, is formed by placing the minus sign (–) before the bracket that includes the feature specification for liquids in the revised SPE feature system.

The second reformulation, avoiding the class complement notation, appears in (59).

$$(59) [-\text{lat}] \rightarrow [-\text{lat}] / [+lat] \left\{ \begin{array}{l} [+syll] \\ [-cons] \\ [-son] \\ [+nas] \end{array} \right\} \text{ ---}$$

This formulation, while empirically adequate, is less satisfactory than (58), since there is no reason why this particular disjunction of features should express the possible intervening environment.⁹

While formulations (58) and (59) using SPE features do not conform to the Relevancy Condition, it is possible using these features to write a rule that does conform to the Relevancy Condition by applying the device of *overspecification*. By overspecification, we mean that redundant features are added to the focus and determinant feature matrices in a rule until the class specified by the features common to these two matrices correctly defines the class of relevant segments. Using overspecification, Latin Liquid Dissimilation is reformulated as (60).

$$(60) \begin{bmatrix} -\text{syll} \\ +\text{cons} \\ +\text{son} \\ -\text{nas} \end{bmatrix} \rightarrow [-\text{lat}] / \begin{bmatrix} -\text{syll} \\ +\text{cons} \\ +\text{son} \\ -\text{nas} \\ +\text{lat} \end{bmatrix} X \text{ ---}$$

The shared features in the focus and determinant specify just the class of liquids.

Odden objects to the overspecification of the determinant and focus of phonological rules in order to make them conform to the Relevancy Condition. Overspecification can be looked at as a process of transferring the complement of features in the intervening part of the environment to the focus and/or the determinant. This is by no means a new proposal in phonology. Chomsky and Halle [6:339] sanction the transferring of features from one part of a rule to another in order to collapse two rules which together express a single generalization but are not otherwise formally combinable. For example, given the two

⁹ Zwicky [22] cites one instance in which the use of the class complement notation allows the collapsing of rules that could not otherwise be combined in the standard theory. The two rules involved are the French truncation rules before foreign and nonforeign lexical items. In view of the scarcity of crucial cases to show the theoretical role of class complement notation, Zwicky asks whether this formal device is indeed justified. In particular, he asks to what extent phonological rules can refer to complements of classes. We note here that the Relevancy Condition provides one such instance. Relevant segments are defined by the Relevancy Condition as the complement of the class of relevant segments.

hypothetical rules (61a, b), one can collapse them only by making use of this convention. The combined rule is (62).

- (61) a. $\left[\begin{array}{l} +\text{syll} \\ +\text{back} \end{array} \right] \rightarrow [+round] / \text{---} k$
 b. $\left[\begin{array}{l} +\text{syll} \\ -\text{high} \end{array} \right] \rightarrow [+round] / \text{---} p$

- (62) $[+\text{syll}] \rightarrow [+round] / \left\{ \begin{array}{l} [+back] \\ [-high] \end{array} \right\} k$
 $\left\{ \begin{array}{l} [+back] \\ [-high] \end{array} \right\} p$

In other cases, a set of rules may be collapsed only by adding redundant features to the individual rules. One example comes from *Nasal Assimilation* in Yoruba. The data in (63) are from Gleason [7].

- (63) a. Stems with /b f/
- | | | | |
|-----|------------|-------|-----------------|
| bá | 'overtake' | m̄bá | 'is overtaking' |
| bá | 'hide' | m̄bá | 'is hiding' |
| bá | 'perch' | m̄bá | 'is perching' |
| f̄s | 'break' | m̄f̄s | 'is breaking' |
- b. Stems with /k g w/
- | | | | |
|------|---------|--------|---------------|
| k̄k̄ | 'write' | ḡk̄k̄ | 'is writing' |
| ḡn̄ | 'climb' | ḡḡn̄ | 'is climbing' |
| wá | 'come' | ḡwá | 'is coming' |
- c. Stems with /l d s ʃ n l r j y/
- | | | | |
|------|----------|--------|----------------|
| l̄s | 'go' | m̄l̄s | 'is going' |
| s̄n̄ | 'sleep' | n̄s̄n̄ | 'is sleeping' |
| ʃ̄ó | 'fight' | n̄ʃ̄ó | 'is fighting' |
| t̄é | 'spread' | n̄t̄é | 'is spreading' |
| d̄n̄ | 'pain' | n̄d̄n̄ | 'is painning' |
- (Pitches are marked 'high, 'mid, 'low.)

It is clear from the data that the underlying form of the progressive prefix in Yoruba is *n*. This prefix assimilates to *m* before labials and to *g* before velars and the glide *w*. The most general set of rules for this assimilation is given in (64).

- (64) a. $\left[\begin{array}{l} +\text{cons} \\ +\text{nas} \end{array} \right] \rightarrow \left[\begin{array}{l} +\text{ant} \\ -\text{cor} \end{array} \right] / \text{---} \left[\begin{array}{l} +\text{ant} \\ -\text{cor} \end{array} \right]$
 b. $\left[\begin{array}{l} +\text{cons} \\ +\text{nas} \end{array} \right] \rightarrow \left[\begin{array}{l} +\text{back} \\ +\text{high} \\ -\text{cor} \end{array} \right] / \text{---} \left[\begin{array}{l} +\text{back} \\ -\text{syll} \end{array} \right]$

These rules contain a total of 13 features and are not collapsible as given. By adding redundant features in both rules we obtain (65).

- (65) a. $\left[\begin{array}{l} +\text{cons} \\ +\text{nas} \end{array} \right] \rightarrow \left[\begin{array}{l} +\text{ant} \\ -\text{cor} \\ -\text{back} \\ -\text{high} \end{array} \right] / \text{---} \left[\begin{array}{l} +\text{ant} \\ -\text{cor} \\ -\text{back} \\ -\text{high} \\ -\text{syll} \end{array} \right]$
 b. $\left[\begin{array}{l} +\text{cons} \\ +\text{nas} \end{array} \right] \rightarrow \left[\begin{array}{l} -\text{ant} \\ -\text{cor} \\ +\text{back} \\ +\text{high} \end{array} \right] / \text{---} \left[\begin{array}{l} -\text{ant} \\ -\text{cor} \\ +\text{back} \\ +\text{high} \\ -\text{syll} \end{array} \right]$

The rules of (65) contain a total of 22 features, but they may be collapsed as (66), which contains only 11 features, constituting a savings of 2 features over (64).

- (66) $\left[\begin{array}{l} +\text{cons} \\ +\text{nas} \end{array} \right] \rightarrow \left[\begin{array}{l} -\text{ant} \\ -\text{cor} \\ \text{ahigh} \\ \text{aback} \end{array} \right] / \text{---} \left[\begin{array}{l} -\text{ant} \\ -\text{cor} \\ \text{ahigh} \\ \text{aback} \\ -\text{syll} \end{array} \right]$

One of Odden's principal objections to overspecification is his claim that it is circular. However, this is not the case. True circularity would entail that any rule could be made to conform to the Relevancy Condition by adding the appropriate redundant features to the determinant and focus. But true counterexamples to the Relevancy Condition cannot be made to conform to it no matter what redundant features are added, as we shall see in §5 in our discussion of Karok and Menomini. Such circularity would arise only if there were no independent constraints on what features may be added in overspecification. But in fact there are severe restrictions on what features may be added. Only

those features that are predicted by redundancy rules or that are present in fully specified underlying forms may be used as redundant features in overspecification.

In discussing Latin Liquid Dissimilation, Odden notes that, by varying the redundant features included in the focus and determinant of a rule, one can write empirically different rules effecting the same change but over different intervening material. Thus in (67), both nasals and *r* are excluded from the intervening environment.

$$(67) \quad \begin{bmatrix} -\text{syll} \\ +\text{cons} \\ +\text{son} \end{bmatrix} \rightarrow [-|\text{lat}|] / \begin{bmatrix} -\text{syll} \\ +\text{cons} \\ +\text{son} \\ +|\text{lat}| \end{bmatrix} X \text{ ---}$$

However, (67) effects the same change as (60). But this is to be expected. The redundant features stated in the focus and determinant are empirically determined, just as are the features used to specify *X* in a theory without the Relevancy Condition. What segments may intervene in a particular type of liquid dissimilation is an empirical question and may vary for liquid dissimilation in different languages.

5. SOME REAL COUNTEREXAMPLES

Two of the cases adduced by Odden are real counterexamples to the Relevancy Condition. These are the rules of *s*-Palatalization in Karok and Mid Vowel Raising in Memomi. After discussing these rules, we shall examine their implications for relevancy theory.

5.1 KAROK *s*-PALATALIZATION

Karok, described by Bright [5], has a rule that palatalizes *s* to \dot{s} after *i* and *y*. This palatalization may operate across an optional intervening consonant, as in (68)–(72). We follow Bright's transcription; the raised period indicates vowel length.

- (68) a. *mú-spuka* 'his money'
 b. *i-špuka* 'money'
 (69) a. *ʔú-skak* 'he jumps'
 b. *i-škak* 'to jump'
- (mu- 'his')
 (ʔu- 'he')

- (70) a. *-sip* 'to start to'
 b. *ʔá:k-sip* 'to raise one's hand'
 one's hand
 c. *išká:k-sip* 'to jump up'
 d. *ikvírip-šip* 'to start to run'
 (pl.) to start off, to leave
 e. *ivyí'h-šip* 'to start off, to leave'
 (pl.) to go
- (71) a. *-sap* 'closing up'
 b. *ikrúp-sap* 'to sew shut'
 c. *siv-šap* 'to plug, seal up'
- (72) a. *im-* 'to be, to be like . . .'
 b. *im-ʔá:x* 'to be red'
 c. *im-šríh* 'to shine'
 (šríh 'shiny')

Examples (68)–(72) show that the intervening consonant may be a stop, a fricative, or a nasal. Thus no consonant in Karok is excluded from the intervening environment.

In Jensen [10], it was proposed that *s*-Palatalization applies iteratively, affecting both the intervening consonant and the input *s*. This rule would conform to the Relevancy Condition, since the intervening environment would always be null, as the Condition predicts for this rule. Odden correctly points out that this analysis is inadequate. The iterative rule that was proposed can be formalized as (73) (=Odden's 21).

$$(73) \quad [+cons] \rightarrow \begin{bmatrix} +\text{high} \\ -\text{back} \end{bmatrix} / \begin{bmatrix} +\text{high} \\ -\text{back} \end{bmatrix} \text{ ---}$$

This rule predicts that any consonant is palatalized after a palatal, in particular after *i*. This is not the case, since there is no palatalized stop in *ʔuvík* (not **ʔuvíkʲ*), for example. In addition, an obligatory rule is needed to depalatalize the intervening consonant, which phonetically is not palatalized. This rule is equivalent to a condition on the surface phonetic segment inventory of Karok, since *s-š* is the only alveolar-alveopalatal contrast in the language. However, depalatalization can not apply to \dot{c} , which is distinct from the sequence *iš*. This exception requires that depalatalization be stated as a separate rule, rather than being a segment structure condition.

In an analysis that does not appeal to iterative palatalization, these complications are avoided. We can state *s*-Palatalization formally as (74).

$$(74) \begin{array}{c} \left[\begin{array}{l} +\text{cons} \\ -\text{syll} \\ +\text{cor} \\ +\text{strid} \\ +\text{cont} \end{array} \right] \rightarrow \left[\begin{array}{l} -\text{ant} \\ +\text{high} \end{array} \right] / \left[\begin{array}{l} -\text{cons} \\ +\text{high} \\ -\text{back} \end{array} \right] \quad ([+ \text{cons}]) \text{ ---} \end{array}$$

Since the input and the determinant share no major class feature, the Relevancy Condition counterfactually predicts that no segment may intervene.¹⁰ Thus we see that *s*-Palatalization in Karok is a true counterexample to the Relevancy Condition.

In this regard, it may be instructive to examine the constraints on the intervening environment in this rule. There is no case where *s*-Palatalization applies across a syllable, as we see in (75).

- (75) *ikpú-h-sip* 'to start to swim' (*ikpúh* 'to swim', *sip* 'to start to')
 **ikpú-h-šip*

When a vowel comes between the focus and the determinant, *s*-Palatalization does not apply. In (76), the initial *a* of *ápsi-h* blocks *s*-Palatalization before it is deleted by a later rule.

- (76) a. *nani* 'my'
 b. *ápsi-h* 'leg'
 c. *nani-psi-h* 'my leg'
 d. **nani-pši-h*

Nor does the rule apply when the intervening environment contains two consonants. The constraints on the intervening environment in *s*-Palatalization are in fact quite strict: only one consonant may intervene.

It is appropriate to ask at this point whether such a strict constraint on an intervening environment has a principled basis, or whether it is merely accidental. Up to this point, we have been implicitly regarding the Relevancy Condition as an absolute condition on rules. Another interpretation is to regard it as a measure of the markedness of a rule. To the extent that rules conform to the condition, they are unmarked. Such rules are expected to occur in languages. To the extent that rules deviate from the condition, they are marked. However, this deviation is not an all or none matter. There *are* degrees of deviation, which

¹⁰ Bright [5] describes *s*-Palatalization as occurring after *e* as well as after *i* and *y*. For example: *vúh-šín-kar* 'gap-toothed'. Although this fact complicates the statement of the rule, it does not alter the implications for the Relevancy Condition, since even with this more general environment, there are still no major class features shared by the focus and determinant.

can be defined in terms of possible intervening environments. For the Karok rule, the Relevancy Condition predicts that the intervening environment is null. If such rules violate the condition by allowing an intervening environment, a number of possible sequences can occur. The intervening environment can consist of one consonant or one vowel, more than one consonant or vowel, a syllable (i.e., a consonant and a vowel), or a sequence of syllables. Let us tentatively define a scale of deviation from 0 to 4, assigned as in Table 1. According to this scale, Karok *s*-Palatalization is evaluated as having a degree of deviation of 1. Since a rule is less marked the smaller the degree of deviation, *s*-Palatalization has a low degree of markedness.

The value assigned to a rule on the scale of deviance makes predictions about the behavior of the rule in language change and acquisition. The more highly marked a rule is, the less productive it is expected to be. Such a rule is likely to become morphologized, and to be lost as a general process in the language. It will be acquired later than other less marked rules, and may be more subject to change in the process of acquisition.

From Bright's description, we can infer that Karok *s*-Palatalization is generally productive. It is not, however, a fully automatic rule in the sense of Kiparsky [13], since there are surface exceptions. We have already seen one type of exception, the result of rule ordering, in (76). Some others are listed in (77), of which some are obvious English borrowings.

- (77) a. *síkspič* 'six bits'
 b. *ké:ks* 'cake'
 c. *nani-ssára* 'my bread' (*nani* 'my', *sára* 'bread')
 d. *šimsi-m* 'knife, metal'
 e. *tašin-sif* 'to brush repeatedly' (*tásif* 'to brush')

Table 1

Degree of deviation	Interpretation
0	Conforms to Relevancy Condition
1	One intervening relevant consonant or vowel
2	More than one intervening relevant consonant or vowel
3	One intervening syllable consisting of relevant segments
4	More than one intervening syllable consisting of relevant segments

It is probable that (77a, b) are loan words. A process of reduplication, probably ordered after *s*-Palatalization, is responsible for (77e). Most likely (77d) is a lexicalized reduplicated form. As for (77c), there is an alternate, *nani-ššara*, the expected form. Bright says that this more regular form is normal for conservative speakers, but that (77c) is normal for others. The existence of surface exceptions to *s*-Palatalization may reflect the fact that it is marked with respect to the Relevancy Condition.

5.2. MEMOMINI MID VOWEL RAISING

Memomini has a rule that raises *e*: to *i*: and *o*: to *u*: when these vowels are followed anywhere in the word by a sequence of a nonsyllabic and an immediately following high vowel or glide. The rule is illustrated by the forms of (78). In citing examples, we follow the transcription used by Bloomfield [2], in which long vowels are written as a vowel followed by a raised period.

- (78) a. ne-mow 'the dances'
 b. ni-mit 'when he dances'
 c. mo-skamow 'he emerges'
 d. mu-skamit 'if he emerges'
 e. ko-n 'snow'
 f. ku-nyak 'jumps of snow'

Odden's formulation of the raising rule is given in (79) (=Odden's 16).

$$(79) \begin{bmatrix} +\text{syll} \\ -\text{low} \\ +\text{long} \end{bmatrix} \rightarrow [+high] / \text{--- } C_0(VC_0)_n C \begin{bmatrix} -\text{cons} \\ +\text{high} \end{bmatrix}$$

It is important to remember that *C* in the intervening environment stands for [-syllabic] rather than [+consonantal]. Glides as well as true consonants can intervene in the rule, as shown in (80).

- (80) a. keme-wan 'it is raining.'
 b. kemi-wanwat 'is it raining?' (-*at* 'interrogative')

Raising applies when a glide, like a consonant, stands immediately before the determining high vowel or glide, as we see in (81).

- (81) a. ke-wew 'he goes home'
 b. ki-wianew 'he takes him home'

In the formulation (79), the focus and determinant share no major class features, or indeed any other features. If we add the redundant feature [-cons] to the focus and the redundant feature [-low] to the determinant, we obtain a revised rule (82).

$$(82) \begin{bmatrix} +\text{syll} \\ -\text{low} \\ +\text{long} \\ -\text{cons} \end{bmatrix} \rightarrow [+high] / \text{--- } C_0(VC_0)_n C \begin{bmatrix} -\text{cons} \\ +\text{high} \\ -\text{low} \end{bmatrix}$$

From rule (82), we can extract the class of relevant segments [-cons, -low]. The nonsyllabic that occurs obligatorily before the high vowel or glide does not qualify as a determinant by Ringen's definition, given in (6). The class of irrelevant segments is the class complement of the relevant segments, -[-cons, -low] or equivalently $\left\{ \begin{bmatrix} [+cons] \\ [+low] \end{bmatrix} \right\}$.

Odden considers the effect of adding the redundant feature [-cons] to the focus in (79), but since he does not also add the redundant feature [-low] to the determinant, he draws the unwarranted conclusion that the addition of redundant features results in the incorrect prediction that only consonants can intervene. As we have seen, when redundant features are added, the Relevancy Condition predicts that both consonants and low nonconsonantals may intervene.

The facts of Mid Vowel Raising, however, show this restriction to be too stringent. Odden claims that all vowels, not just low vowels, can intervene. This overstates the case, however. Long mid vowels *e*' and *o*', which are possible foci, do not intervene in Mid Vowel Raising. When two or more possible foci occur in a word, Mid Vowel Raising applies iteratively to each one (see Jensen and Strong-Jensen [12] for a justification of iterative over simultaneous application). Since any noninitial vowel in Memomini, except *a* and *a*', is preceded by a consonant or glide, a long mid vowel which has been raised by one application of Mid Vowel Raising constitutes a potential determinant for another application of the rule. In (83) we give an example of iterative application of Mid Vowel Raising.

- (83) ni-ci-skiw 'my enemy'¹¹
 From *n* - 'first person singular personal prefix'
 -*e't* - dependent root, 'accompany'
 (compare *ke-taqnem* 'thy fellow dog'
 -*e'ski'w* 'concrete noun final')

High vowels *i*, *i'*, *u*, *u'* likewise do not intervene in Mid Vowel Raising. Since morpheme structure constraints of Menomini dictate that high vowels in noninitial position are always preceded by a consonant or glide, any noninitial high vowel will function as a determinant for Mid Vowel Raising. Cases may arise where a long mid vowel is followed by two possible determinants. Such cases present an indeterminacy, since there are two possible analyses of the input string which are related to an unambiguous output. In such cases, the Relevancy Condition resolves the indeterminacy by choosing the determinant that is closer to the focus. Thus in (84) the Relevancy Condition chooses *mi* rather than *mi'* as the determinant, since Mid Vowel Raising cannot cross a high vowel.

- (84) wi-s-miani'w 'horned owl' (*wes*-proun, 'horned')
 (Also occurs as *wes*-*miani'w*, perhaps with a boundary strong enough to block Mid Vowel Raising.)

However, two kinds of vowels can intervene in Mid Vowel Raising: low vowels and short mid vowels. The possibility of intervening low vowels is predicted by the Relevancy Condition (see e.g. (78d)).¹² However, short mid vowels, being nonlow, are part of the class of relevant segments, and so should not intervene. The vowels *e* and *o* appear in the intervening environments of (85).

¹¹ The *i* of the root -*e't* - is changed to the affricate *c'* by an independent rule. The rule shortening *i'* of -*e'ski'w* appears to be optional, since the long vowel may also occur as in *mi'et'ski'w*. Neither of these rules affects the present discussion.

¹² The low front vowels *e* and *e'* variably blocking raising. In (i) and (ii), Raising is blocked by these vowels, while in (iii) the rule applies across *e* and in (iv) it is blocked in the same word.

- (i) ke-wask-epi'w 'he is drunk'
 (ii) ke-we-tuag 'when they go home'
 (iii) pepu-ne-hkwah 'all winter long'
 (iv) pepu-ne-hkwah 'all winter long'

This is another illustration of the fact that the Relevancy Condition does not have the power to predict which of the segments allowed in principle to intervene may indeed intervene. Mid Vowel Raising must be stated so as to exclude low front vowels from the intervening environment, perhaps variably.

- (85) a. po-set 'when he embarks'
 b. pu-setuag 'when they embark'
 c. nato-mekol 'if he calls him'
 d. natu-mekotwa? 'if he calls them'

Furthermore, the glides *w* and *y*, which also belong to the class of relevant segments (*l*-cons, -low), may also intervene, as in (80b) and (81b). This fact was not noted by Odden.

Under the interpretation of the Relevancy Condition as a measure of markedness, Mid Vowel Raising is marked. It does not allow potential foci to intervene, in accordance with the Crossover Condition (Howard [8]). But some relevant segments, namely the short mid vowels and glides, can intervene. Mid Vowel Raising allows syllables as intervening material. Any number of syllables consisting of relevant segments, e.g. *wes*, can intervene in this rule. According to the scale of deviance proposed in §5.1, Mid Vowel Raising as discussed by Odden is marked to a high degree.

However, the degree of markedness of Mid Vowel Raising is relative to the analysis of the phonology of which it is a part. In Bloomfield [2, 3], and in ensuing treatments of Menomini by Bever [1] and Howard [8], the determinant is assumed to be either a vowel or a glide at the time Mid Vowel Raising applies. But it is also possible to analyze the determinant as only the class of high vowels. When *y* or *w* function as determinant, they are always followed by a long or short *a*. Glides in Menomini do not generally occur after consonants in phonetic forms. They occur postconsonantly only in the sequences *C_{wa}*, *C_{wa'}*, *C_{ya}*, and *C_{ya'}*. According to Bloomfield, sequences of glide plus short or long *a* are phonetically diphthongs. Postconsonantal *w_a*- and *y_a*- are long *a* are phonetically diphthongs. Postconsonantal *w_{a'}*- or *i'*-falling diphthongs, consisting phonetically of a long vowel *u'*- or *i'*- followed by a nonsyllabic *a* (Bloomfield [2:1.8, 4.66]). Postconsonantal *w_a*- is phonetically [u-ə], and postconsonantal *y_{a'}*- [i-ə]. Postconsonantal *w_a* and *y_a* are rising diphthongs, consisting of a nonsyllabic *a* followed by a syllabic *a*. The canonical constraints on glides as well as the phonetic facts can be accounted for by representing these combinations as underlying vowel sequences, *ua*, *ua'*, *ia*, and *ia'*. These are indeed the only vowel sequences that occur in Menomini. Phonetic rules applying after Mid Vowel Raising convert *ua*- and *ia*- to *uə* and *iə*, and *ua'* and *ia'* to *w_a* and *y_a*.

In this analysis, the determinant for Mid Vowel Raising is just a high vowel. The rule is reformulated as (86), with the possible intervening vowels made explicit.

$$(86) \begin{bmatrix} -\text{cons} \\ +\text{syll} \\ -\text{low} \\ +\text{long} \end{bmatrix} \rightarrow$$

$$[+\text{high}] / \text{--- } C_0 \left(\begin{bmatrix} +\text{syll} \\ [+low] \\ [-high] \\ [-low] \\ [-long] \end{bmatrix} C_0 \right)_0 C \begin{bmatrix} +\text{syll} \\ +\text{high} \\ -\text{low} \end{bmatrix}$$

Note: e, ϵ may variably block Mid Vowel Raising

In this reformulation, intervening glides are no longer exceptions to the Relevancy Condition, since they are not part of the class of relevant segments, which in (86) are the nonlow vowels. Mid Vowel Raising is less marked under this analysis than under Odden's, since only relevant vowels, not relevant nonsyllabics, can intervene.

This result coincides more satisfactorily with facts about acquisition. Bloomfield states [2:1.8] that Mid Vowel Raising is maintained by younger speakers "as regularly as [by] older ones." The rule is acquired even though the change in the phonology of younger speakers makes it opaque. In the grammar of younger speakers, a rule has been added that merges i with e . Mid Vowel Raising, however, applies in the same contexts as it does for older speakers. The added neutralization rule is ordered after Mid Vowel Raising and renders the latter opaque. While older speakers preserve the determinant i phonetically, younger speakers pronounce it as e , as in (87).

- (87) a. *mo-skamow* 'the emerges'
 b. *mu-skamit* 'if he emerges' (older speakers)
 c. *mu-skamet* 'if he emerges' (younger speakers)

The persistence of Mid Vowel Raising in spite of this opacity attests to its relative naturalness.

Mid Vowel Raising is not entirely productive, however. According to Bloomfield, there is "much fluctuation. That is, the lower vowel (e, o, ϵ) is sometimes spoken when the higher one would be expected" [2:1.8]. Bloomfield cites two lexical exceptions: the verb roots *o-ho-h-* 'call out' and *o-hop-* 'whoop', which do not undergo Mid Vowel Raising, as in (88).

- (88) *o-ho-hatimow* 'he weeps aloud'
o-ho-pi-we-kat 'there is a sound of whooping'

The reformulation (86) of Mid Vowel Raising can be evaluated only on the basis of a more extensive analysis of Menomini phonology. However, its consequences in terms of the Relevancy Condition are more in keeping with the productivity of the rule than those of Odden's formulation (82).

6. CONCLUSION

We have proposed the interpretation of the Relevancy Condition as a measure of markedness on the basis of two counterexamples to an absolute interpretation of the Condition. Clearly, other cases which do not conform to the Relevancy Condition as originally stated must be brought forth to make possible further refinement and justification of this proposal. Odden seeks to reject the Relevancy Condition on the basis of a series of alleged counterexamples. We have found that the two examples of his that present real problems allow us to revise our interpretation of the Relevancy Condition to achieve a more explanatory hypothesis. Far from rejecting the Relevancy Condition, we must maintain and develop it. Only by adding problematic cases can we discover an empirically adequate formulation of the Relevancy Condition.

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Clause Reduction, the Saturation Constraint, and Clitic Promotion in Spanish

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In a recent paper, Quicoli [11] has argued that the behavior of clitic pronouns in the Romance languages constitutes evidence in favor of the tensed sentence condition (TSC) and the specified subject condition (SSC) proposed by Chomsky [5].

The TSC predicts that no clitic can be extracted from a tensed sentence, thus accounting, according to Quicoli,¹ for the ungrammaticality of (1a), *vis-a-vis* the grammaticality of (1b):

- (1) a. *Juan la quiere que yo vea.
- b. Juan quiere que yo la vea.
- John wants me to see her.

SSC prohibits the extraction of a clitic from a clause with a 'specified subject.'² Following Chomsky, Quicoli assumes that there are three types of specified subjects: (a) lexically specified subjects, as in the complement of (2); (b) trace subjects, as in the complement of (3); (c) interpreted subjects, as in the complement of (4).

- (2) Pablo vio [el especialista—examinar—la].
Paul saw [the specialist examiner her].
- (3) El médico parece [t—haber examinado—la].
The doctor seems [t—to have examined her].
- (4) El médico prometió [a Bruno] [PRO informar—la—sobre el resultado].
The doctor promised [Bruno] [PRO to inform—her—about the result].

According to Quicoli, the fact that none of these sentences allows the promotion of the clitic *la*, that is, (5)–(7) are ungrammatical, follows directly from SSC.

- (5) *Pablo la vio el especialista examinar.
Paul saw her the specialist examine.

¹ Quicoli's examples are from Portuguese, but the same facts hold for Spanish.