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# Assigned Rule Features in Shona

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One of the descriptive devices which is available in the theory of Chomsky and Halle (1968) to account for phonological irregularity is a rule exception feature assigned by a readjustment rule to a morpheme in some context. An assigned rule exception feature could, for example, account for exceptionality which is not a property solely of a single lexical formative but results from certain combinations of morphemes. However, the actual existence of rules assigning rule exception features has not been well demonstrated in the literature, and it has therefore been proposed in Kiparsky (1968) and Iverson and Ringen (1976) that rules which assign exception features should be disallowed in principle. It is the purpose of the present paper to demonstrate that there exists in Shona a rule which assigns a rule exception feature to three morphemes when they stand in a particular syntactic environment. In the first section, I motivate an very general tone sandhi rule which lowers a H tone at the end of a word between H tones. I then demonstrate in the second section that three morphemes are contextual exceptions to this tone sandhi rule, but are marked as exceptions only when they stand in a particular surface syntactic relation to the focal tone. I then propose a readjustment rule which assigns a rule exception feature to these three morphemes in the proper environment. In the third section, I consider alternatives to the proposed readjustment rule. I show that the Sandhi Lowering rule cannot

be reformulated to express the restriction directly. An abstract analysis is proposed which manipulates the underlying tone sequences in an attempt to prevent application of Sandhi Lowering; this analysis is shown to be inadequate as an alternative to the rule feature approach. Finally, I discuss an analysis which manipulates boundary symbols, and reject that analysis as incorrect. I conclude with a discussion of certain theoretical proposals regarding the theory of exceptions. I show that the constraints proposed in Kiparsky (1968) and Iverson and Ringen (1976) are too strong, and propose four alternative constraints on rule exception features and diacritics whihc disallow certain types of rules involving rule exception features which are unattested.

1. Sandhi Lowering

Whenever a H tone stands at the end of a word, is preceded by a H tone and is followed in the next word by a H tone, the word final H tone is lowered to a L tone. As deomstrated in (1), the underlying tonal sequence HH#H is changed to HL#H by the application of the Sandhi Lowering rule. For all words, the input to Sandhi Lowering may eb taken to be the isolation form of the word.

| | | |
|---|---|---|
| (1) | murúmé | 'man' |
| | húkútú | 'hard' |
| | ndakápá | 'I gave' |
| | hárí | 'pot' |
| | ákapá | 'he gave' |
| | mukúrú | 'large' |
| | murúme ákapá | 'the man gave' |
| | hári húkútú | 'hard pot' |
| | ndakápa hárí | 'I gave a pot' |
| | ndakápá murúme hárí | 'I gave the man a pot' |
| | ndakápá murúme mukúru hárí | 'I gave the large man a pot' |

On the other hand, if the word final H tone is either preceded or followed by a L tone, then Sandhi Lowering will be inapplicable. Thus, the sequences HH#L and LH#H are unaffected by Sandhi Lowering.

| | | |
|---|---|---|
| (2) | badzá | 'hoe' |
| | rákatórwá | 'it was taken' |
| | badzá rákatórwá | 'the hoe was taken' |
| | ákapá hárí | 'he gave a pot' |
| | ákapá badzá | 'he gave a hoe' |
| | ndakápá murúmé | 'I gave to the man' |

As demonstrated below in (3), a word having the underlying tone sequence HL at the end of the word retains that tone pattern in isolation and when followed by any other word.

(3)

| | |
|---|---|
| chapúpu | 'witness' |
| bhúku | 'book' |
| ndaénda | 'I went' |
| chapúpu afá | 'the witness who died' |
| bhúku húkútú | 'hard book' |
| ndaénda kumushá | 'I went to the village' |

The Sandhi Lowering rule also applies to a H tone in a monosyllabic word, when the preceding word ends in a H tone and the following word begins with a H tone, as shown below in (4).

(4)

| | |
|---|---|
| ánodá | 'he wants' |
| mbwá | 'dogs' |
| tsvá | 'new' |
| ánodá mbwa húrú | 'he wants big dogs' |
| ndakápa mbwá | 'I gave dogs' |
| ndakápa mbwá tsvá | 'I gave new dogs' |
| ndakápa mbwá tsva húrú | 'I gave big new digs' |

Sandhi Lowering will not apply to a word initial H tone, even if it is both preceded and followed by H tones, unless the word initial tone is also word final, as will only be the case in a monosyllable. Thus, the underlying tone sequence H#HH is unchanged on the surface.

(5)

| | |
|---|---|
| ánodá hárí | 'he wants a pot' |
| *ánodá harí | |
| haákapútsisá hárí | 'he didn't smash a pot' |
| *haákapútsisá harí | |

In order to account for these data, I therefore propose the following Sandhi Lowering rule.

(6) H ⇒ L / H (#) ___ #H  Sandhi Lowering

The parentheses which surround the lefthand word boundary symbol indicate that the lefthand H tone may either be contained in the same word as the focal H tone, as in the example murúme áfá 'the man died', from murúmé áfá, or else may stand in the preceding word, as in the example ndapá mbwa húrú 'I gave a large dog', from ndapá mbwá húrú.

It might be expected that Sandhi Lowering does not apply across certain types of syntactically determined phrase boundaries, since phrase level rules are often constrained to apply only to certain types of constituents, as is shown for example in Kisseberth and Odden (1980). This is nevertheless not the case with Sandhi Lowering. For any pair of words with any grammatical relationships, Sandhi Lowering applies, provided the phonologically constrained structural description is satisfied. [1]

| | | |
|---|---|---|
| (7) | murúmé | 'man' |
| | ndakáónâ | 'I saw' |
| | hárí | 'pot' |
| | Hárí | 'Hari (proper name)' |
| | rakátórá | 'which he took' |
| | wakádyíwá | 'what was eaten' |
| | ndinódá | 'I want' |
| | mvúrá | 'water' |
| | murúme ákábíka | 'the man cooked' |
| | ndakáóna hárí | 'I saw a pot' |
| | hári húkútú | 'hard pot' |
| | ndakátóréra Hári bhúku | 'I took a book for Hari' |
| | badzá rakátóra Fárái | 'the hoe that Farai took' |
| | wakádyíwa ná-Chipó | 'what was eaten by Chipo' |
| | ndinóda chóse | 'I want very much' |
| | ndinódá murúme chóse | 'I want the man very much' |
| | zvaákábiká mvúra Fárái | 'when Farai boiled water' |

The last example is particularly interesting, since, as argued by Hodges (in progress), the subject NP Fárái does not play any grammatical role in the sentence, and functions syntactically as a parenthetical expression, similar to the phrase 'my uncle' in the English sentence 'He's hardworking, my uncle'. It must be concluded on the basis of the data in (7) that Sandhi Lowering is not limited in its application to any particular level of phrase, but instead applies regardless of syntactic relationship.

## 2. Exceptions to Sandhi Lowering

Although Sandhi Lowering is extremely in its application and there are no lexical or categorial restrictions on that rule, there exists a specific context where Sandhi Lowering does not apply, despite the fact that the phonological requirements of that rule are satisfied. When the demonstrative adjectives ríno 'this' and ríya 'that' stand inside a noun phrase, the initial H tone of these demonstratives fails to trigger application of Sandhi Lowering to the preceding H tone. [2]

| | | |
|---|---|---|
| (8) | bángá | 'knife' |
| | bángá ríno | 'this knife' |
| | hárí íno | 'this pot' |
| | hárí íya | 'that pot' |
| | murúmé úno mukúrú | 'this big man' |
| | murúmé mukúrú úno | 'this big man' |

The third morpheme which fails to trigger the application of Sandhi Lowwering is the prefix -é- 'of' [3] whose H tone does not condition the application of Sandhi Lowering to the preceding H tone.

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| | | |
|---|---|---|
| (9) | murúmé wé-chikóro | 'man of the school' |
| | mukádzí wá-Fárái | 'wife of Farai' |
| | hárí yé-hwahwá | 'pot of beer' |
| | hárí yá-Chipó | 'Chipo's pot' |
| | hári húrú yá-Chipó | 'Chipo's large pot' |
| | hári húrú yé-hwahwá | 'large pot of beer' |

However, it is not the case that the three morphemes ríya, ríno and -é- are across the board exceptions to the application of Sandhi Lowering. These three morphemes will in fact trigger the application of Sandhi Lowering to a preceding H tone, but only if that H tone does not stand inside the same noun phrase with these morphemes. Thus, as shown in (10), the morphemes ríya, ríno and -é- cause the lowering of a preceding H tone which stands outside of the surface syntactic configuration $[_{NP_i}{}^{X}\_\_ \begin{Bmatrix} \text{rino} \\ \text{riya} \\ \text{-e-} \end{Bmatrix}^{Y}{}_{NP_i}]$

| | | |
|---|---|---|
| (10) | ndakápá | 'I gave' |
| | murúmé | 'man' |
| | í-bángá | 'it is the knife' |

$[_{VP}$ndakápá $[_{NP}$murúme$_{NP}][_{NP}$yá-Chipó$_{NP}]_{VP}]$

'I gave to the man (the thing) of Chipo'

$[_{VP}$ndinóda $[_{NP}$yá-Fárái$_{NP}]_{VP}]$

'I want (the thing) of Farai'

$[_{NP}$í-bánga$_{NP}][_{VP}$ró-mukómaná$_{VP}]$

'it is the knife of the boy'

$[_{VP}$ndakápa$[_{NP}$ríyá$_{NP}]_{VP}]$

'I gave that'

$[_{VP}$ndakátórérá$[_{NP}$murúme$_{NP}][_{NP}$chíno$_{NP}]_{VP}]$

'I took this for the man'

It can therefore be seen that the three morphemes ríya , ríno and -é- are contextual exceptions to the application of Sandhi Lowering only when they stand in the surface syntactic environment $[_{NP}[+segment]_1$ ___ $Y_{NP}]$. Moreover, the exceptionality of these three morphemes is in fact a property of these specific morphemes, and is not encountered with other demonstrative or prefixal morphemes in a syntactically parallel environment. Thus, Sandhi Lowering applies to the final H tone of a noun which stands before the H tone of the demonstrative rípí 'which' or írerí 'this very', or before the associative prefixes né- 'with' and sé- 'like'.

| | | |
|---|---|---|
| (11) | bánga rípí | 'which knife?' |
| | bánga írerí | 'this very knife' |
| | bánga né-badzá | 'knife and hoe' |

| | |
|---|---|
| hárị dzípí | 'which pot?' |
| murúme nó-mukádzá | 'man and woman' |
| ánoímbá | 'he sings' |
| ánoímba sé-mbwa | 'he sings like a dog' |

In order to express the restricted nature of the failure of Sandhi Lowering, I propose that a contextual rule exception feature is introduced into the morphemes ríya, ríno and -é- by the following readjustment rule.[4]

(12) $\left\{\begin{matrix}\text{rino}\\ \text{riya}\\ \text{-e-}\end{matrix}\right\} \Rightarrow$ [-context Sandhi Lowering] $/[_{NP}\ [+\text{segment}]_1$ ____

According to this rule, when one of the three morphemes under consideration stands in the correct syntactic environment, a rule exception feature will be introduced into that morpheme, which then prevents the H tone of that morpheme from serving as the righthand contextual H tone for application of Sandhi Lowering.

## 3. Alternatives to the Rule Feature Approach

I have demonstrated how a rule exception feature may be assigned by a readjustment rule to the morphemes -é-, ríno and ríya in order to explain the inapplicability of Sandhi Lowering in the context outlined above. However, before this analysis can be fully accepted, along with any theoretical conclusions which follow from the existence of the readjustment rule (12), it must also be shown that no reasonable alternative analysis is available which is capable of accounting for the same facts. I shall therefore consider three alternatives which attempt to account for the same facts, but employ different descriptive approaches. Under one alternative, the Sandhi Lowering rule will be reformulated to directly exclude the relevant combination of morphemes in the desired environment, by the addition of sufficient detail in the formulation of Sandhi Lowering, with the desired goal that Sandhi Lowering will be inapplicable in that environment, because its structural description is not satisfied. Under a second alternative, an extra abstract stage in the derivation is added. In this analysis, the phonetic string is altered so that the required H tone on the right of the focal tone is not present at the stage where Sandhi Lowering applies. Under a third alternative, the boundary between the righthand context and the focal H tone is altered, in an attempt to block application of Sandhi Lowering. I shall show that all three of these alternatives are untenable and adhoc, and that the only viable device for capturing the relevant generalization is the readjustment rule (12).

3.1 Reformulation of Sandhi Lowering. The first alternative to the readjustment rule is to reformulate Sandhi Lowering so that the morphemes ríya, ríno and -é- in the relevant environment do

not satisfy the structural description of Sandhi Lowering. Since it is neither a systematic property of these morphemes that they fail to condition Sandhi Lowering, nor a systematic property of the surface syntactic environment where the exceptionality is observed that Sandhi Lowering does not apply, it will be necessary to employ angled brackets in the reformulation of Sandhi Lowering, since only angled brackets allow conditional statements to be encoded into rules. Sandhi Lowering might be reformulated as (13).

(13) H → L / H (#) ___ $\langle [_{NP}$ # H $\{$ríya, ríno, -é-$\}\rangle$

However, this reformulation does not correctly restrict Sandhi Lowering in the desired manner. Rule (13) abbreviates the following disjunctively ordered subrules, according to the conventions on expansion of angled brackets set forth in Chomsky and Halle (1968).

(14) H → L / H (#) ___ $[_{NP}$ # H $\{$ríya, ríno, -é-$\}$ (a)

H → L / H (#) ___ # H (b)

The first subrule applies to a H tone when it is followed by the H tone of the morphemes ríno, ríya and -é-, provided the righthand H tone does not stand within the same noun phrase as the focal H tone. The longest expansion therefore does correctly apply to a H tone standing before these three morphemes when the focal and determinant tones stand in the correct syntactic relation, as in the form íbánga ró-mukómaná 'it is the knife of the boy'. However, the shorter expansion of (13), namely (14b) is in fact identical to the original formulation of Sandhi Lowering (6). Accordingly, the string [bángá ró-murúmé] is scanned to determine if it satisfies the structural description of either subrule (14a) or (14b). Since no noun phrase bracket intervenes between the focal H tone of the noun bángá and the righthand determinant H tone of the prefix ro- , subrule (14a) cannot apply to the string under consideration. The string will therefore be scanned to determine if it satisfies the conditions of the shorter expansion, subrule (14b). That subrule merely requires a H tone between two H tones; that condition is satisfied, so subrule (14b) will apply, and will yield the incorrect surface form *bánga ró-murúmé. Thus, the attempt to directly restrict the application of Sandhi Lowering fails, since it is impossible to correctly prevent the shortest expansion of that rule from applying in the environment $[_{NP}\ Y\ \_\_X_{NP}]$.

3.2 An Abstract Alternative. Another Alternative to the proposed readjustment rule is to introduce an abstract stage in the grammar whereby the phonetic requirements imposed on the Sandhi Lowering rule are not satisfied. Under this hypothesis, the apparent failure of Sandhi Lowering to apply in the string bángá rá-Fárái is explained by assuming that this string has the phonetic shape bángá ra-Fárái as the stage in the derivation where Sandhi Lowering applies. If the prefix rá- has a L tone at this stage in the derivation, Sandhi Lowering will be unable to apply to the final H tone of the noun bángá, since that H tone is not preceded by a H tone. In this fashion, the surface failure of Sandhi Lowering might be explained without recourse to a readjustment rule introducing a rule exception feature.

However, this hypothesis also entails a readjustment rule to lower the underlying H tone of the morphemes -é- , ríno and ríya in the requisite environment. Thus, rule (15) will be required.

(15) $\begin{Bmatrix} \text{-é-} \\ \text{ríno} \\ \text{ríya} \end{Bmatrix}$ H → L / [$_{NP}$ X ___ Y $_{NP}$] Lowering Readjustment

This rule will apply to the underlying form bángá rá-Fárái, and will yield the form bángá ra-Fárái. At the stage where Sandhi Lowering applies, the final H tone of the noun bángá will not stand in the correct phonetic environment, and will therefore not be lowered. At a later stage, the tone of the prefix ra- must be raised to H, since that prefix bears a H tone in the surface form bángá rá-Fárái. Therefore, a second tone readjustment rule must be added to the grammar which reraises the tone of the three morphemes -é- , ríno and ríya just in case their underlying tone was lowered by application of the Lowering Readjustment rule (15).

(16) $\begin{Bmatrix} \text{-é-} \\ \text{ríno} \\ \text{ríya} \end{Bmatrix}$ L → H / [$_{NP}$ X ___ Y $_{NP}$] Raising Readjustment

The following derivation illustrates how the proposed tone readjustment rules apply to derive the correct surface string bángá rá-Fárái from the underlying string bángá rá-Fárái.

| | | |
|---|---|---|
| (17) | bángá rá-Fárái | underlying |
| | bángá ra-Fárái | Lowering Readjustment |
| | NA | Sandhi Lowering |
| | bángá rá-Fárái | Raising Readjustment |

It is clear that the tone readjustment approach fails to explain the inapplicability of Sandhi Lowering in any insightful

manner, since it entails two adhoc readjustment rules with identical structural descriptions. The Raising Readjustment rule is designed to apply to exactly that set of forms where Lowering Readjustment applies. The tone readjustment approach clearly cannot be prefered to the rule exception analysis on grounds of simplicity or explanatory power. Moreover, the tone readjustment analysis outlined above is empirically incorrect, since the Raising Readjustment rule as formulated in (16) will apply to the prefix -e- in environments where that prefix should appear on the surface with a phonetic L tone. As demonstrated below in (18), the prefix -e- does not bear a H tone on the surface whenever it stands inside a noun phrase. [5]

| | | |
|---|---|---|
| (18) | bắngắ ro-mũnhu | 'knife of the person' |
| | hắrĩ yo-kũbikisa | 'pot to cook with' |
| | mapắngắ a-vắnhu | 'knives of the people' |
| | sadza ro-mũrimi | 'porridge of the farmer' |

Under the tone readjustment analysis, Raising Readjustment should incorrectly apply to the string bắngắ ro-mũnhu, and would yield the incorrect form *bắngắ rố-mũnhu. The tone readjustment analysis must therefore be rejected since it does not express the correct generalizations in a simple or general manner, and furthermore does not account for all of the facts.

3.3 Boundary Adjustment. The third alternative to the rule feature analysis that I shall consider is one which relies on a crucial distinction of boundary symbols to account for the failure of Sandhi Lowering. It is concievable that the boundary relationships between words is altered in some fashion in the proper environment, and that the presence or absence of a boundary can be held responsible for the failure of Sandhi Lowering. I reproduce the Sandhi Lowering rule here for ease of reference.

(19) H $\not\rightarrow$ L / H (#) ____ # H

The presence or absence of a word boundary versus a morpheme boundary to the left of the focal tone is irrelevant, since Sandhi Lowering applies both when the lefthand determinant H tone is within the same word as the focal tone and when the determinant tone is in a defferent word. The presence of a word boundary to the right of the focal tone will not block the application of Sandhi Lowering, and is in fact required for the application of that rule. Therefore, the only manipulation of boundaries which could possibly affect the applicability of Sandhi Lowering would be to replace the word boundary between the focal and righthand determinant H tones with a morpheme boundary in the relevant environment. Thus, if the surface string bắngắ rố-murúmế had the structure bắngắ+rố+murúmế at the stage when Sandhi Lowering is applied, Sandhi Lowering would be prevented from applying, since the word boundary crucial to the application of Sandhi Lowering

would not be present. Under the boundary distinction analysis, it would therefore be necessary to include a boundary readjustment rule such as (20).

$$(20) \quad \# \rightarrow + \; / \; [_{NP_i} \; [+segment]_1 \; \_\_ \; \begin{Bmatrix} \text{-é-} \\ \text{ríya} \\ \text{ríno} \end{Bmatrix} \; X_{NP_i}]$$

As far as I can determine, this analysis will in fact generate all of the required surface forms. It is not clear, however, that the boundary manipulation analysis is actually preferable to the rule feature analysis. The boundary manipulation analysis requires the theory to be extended to include rules which change one boundary symbol into another boundary symbol, while the rule feature analysis requires the theory to be extended to include rules which introduce rule exception features. Insofar as neither of these devices are well attested, neither analysis has the advantage of employing independently motivated descriptive devices.

The boundary manipulation analysis does entail certain intuitvely incorrect conclusions. For instance, this analysis implies that the distinction between the phrase íbánga rɔ́-murúmé 'it is the knife of the man' and the phrase bángá rɔ́-murúmé 'knife of the man' is that the former string is composed of two words, whereas the latter string constitutes a single word, viz. bángárɔ́murúmé. The boundary manipulation analysis furthermore suggests that the morphosyntactic bond between the head noun phrase and the associative prefix ro- should be identical to the bond between the associative prefix and the possessor noun phrase. This is not in fact the case, since the combination Associative Prefix + NP is a well formed utterance, viz. rɔ́-murúmé 'of the man', but the combination NP + Associative Prefix is never well formed, viz. *banga-re.

A rule exception feature is probably a more appropriate device for expressing the restriction on Sandhi Lowering than boundary manipulation, since rule exception features are specifically designed to express adhoc lexical restrictions on rules, whereas boundaries are typically an expression of more general syntactic relations between morphemes. The fact that the entire question of exceptionality must be limited to certain lexical items indicates that general syntactic relations are not involved, and ideosyncratic lexical relations are. It would therefore seem more appropriate to encode this exceptionality with the descriptive device best designed for this type of phenomenon, namely a rule exception feature.

## 4. Implications

The literature on rule exception features includes a number of attempts to exclude from the theory rule which introduce rule

exception features. Thus, Kiparsky (1969:13) suggests that:

> It is likely that the correct condition is even stronger, and excludes the use of rule features as elements in the structural index or structural change of phonological rules... Likewise, it probably should exclude the assignment of rule features to particular morphemes or segments by means of readjustment rules.

This position, which constitutes one of the strongest possible restrictions on rule exception features, states that a rule exception feature may be included in the lexical representation of a morpheme, but can never be introduced or spread by any rule. This then entails the conclusion that a rule exception feature can never be the result of the combination of two morphemes. This hypothesis is, however, controverted by the existence of the readjustment rule in Shona which assigns a rule exception feature.

A weaker position on the theory of exceptions is advanced in Iverson and Ringen (1976). They address the question of environmental exceptions to phonological rules, as well as the role of diacritic feature and rule exception features in describing exceptional behavior. It is proposed there that environmental exceptions are always characterized with diacritically triggered phonological rules. For instance, they reformulate the Velar Shift rule of Russian proposed in Coats (1970), by including the diacritic feature +D as a crucial feature of the righthand determinant vowel.

(21) k ⇒ ĸ / ____ $\begin{bmatrix} -\text{cons} \\ -\text{back} \\ +\text{D} \end{bmatrix}$

Under this reformulation of Velar Shift, suffixes which cannot provide the righthand context are marked -D, and thus will not satisfy the structural requirements of the Velar Shift rule.

In conjunction with the proposal that environmental exceptions are characterized by diacritically triggered rules, Iverson and Ringen propose a general constraint on rule exception features, namely that rule exception features can only be assigned by a context free rule. According to this constraint, a rule exception assignment rule such as (22) would be ruled out on principled grounds.

(22) k ⇒ [-Velar Shift]/ [+D] + $C_0VC_0$____

This constraint on the assignment of rule exception features thus makes it impossible for a grammar to contain so-called 'detatched'

exceptions, where a segment is blocked from undergoing a rule by the presence of another segment which does not enter into the structural description of the rule in question. Thus, in the case of rule (22), Velar Shift is hypothetically blocked by a diacritically marked vowel which precedes the focal velar consonant, although no segment preceding the focal velar is specified in the formulation of Velar Shift.

The constraint on assignment of rule exception features constitutes a strong and interesting hypothesis, at least to the extent that it cannot be automatically circumvented by manipulating diacritic features in precisely the same manner that rule exception features have been manipulated. The constraint which Iverson and Ringen propose, that a rule exception feature cannot be introduced by a context sensitive rule, is falsified by the existence of the rule exception readjustment rule which I have motivated here for Shona. As such, the constraint on rule exception features which they propose cannot be accepted.

It is trivially possible to maintain their constraint on rule exception features, providing that one is allowed to maintain a relatively unconstrained theory of diacritic features. Rather than introduce a rule exception feature, the readjustment rule (12) could be restated to introduce a diacritic feature.

(23) H $\rightarrow$ [+D] / $[_{NP_i}$ X __ $\left\{\begin{matrix}\text{-é-}\\ \text{ríya}\\ \text{ríno}\end{matrix}\right\}$

Sandhi Lowering would then be formulated so that it only applies to H tones which do not have the diacritic feature +D, which is assigned by rule (23).

(24) H $\rightarrow$ L / H (#) ____ # H
[-D]

Therefore, while the constraint on rule exception features proposed by Iverson and Ringen potentially (and incorrectly) limits the power of the grammar, it only does so when the theory of diacritic features is properly constrained.

I have demonstrated that is is necessary to include in the grammar of Shona a readjustment rule which assigns a rule exception feature is a certain morphosyntactic environment. The existence of this readjustment rule therefore stands as a counterexample to certain claims that rule exception features cannot be assigned by rules. Additional examples of assigned rule features will be needed to determine precisely what constitutes a possible rule assigning rule exception features. As a tentative hypothesis, I suggest four constraints on rules exception features and diacritic

features.

a) A rule exception feature may not be assigned in a purely phonological environment

b) A rule exception feature may only appear in the structural change of a rule, and may not appear in addition to any phonological feature in the structural change of the rule.

c) A diacritic feature may not appear in the structural change of a rule.

d) Any rule containing a rule exception feature must be ordered before any rule containing a phonological feature in its structural change.

It may develope that certain of these constraints will be weakened or strengthened, based on the discovery of additional examples of rule exception features which are assigned by rule. Whatever modifications are necessary to properly constrain the theory of exceptions, it is clear that rules assigning rule exception features cannot be disallowed across the board.

FOOTNOTES

* The data for Shona used here are from the Karanga dialect, and have been collected during the period 1977-1980. I owe thanks to Kokerai Rugara for providing all of my data, and to the African Studies Center at the University of Illinois for supporting this work financially.

[1] Application of Sandhi Lowering is blocked by the presence of a pause before or after the focal H tone. A pause generally occurs between sentences, thus ndakátórá, Fárái akaenda 'I took, and then Farai went'. The presence of pause not only blocks the application of Sandhi Lowering, but also causes the level of dowdrifted H tone to be raised to the level of an utterance initial H tone.

[2] In actual fact, the exceptional items include all of the demonstratives formed on the pattern Agreement Prefix + no and on the pattern Agreement Prefix + ya. The demonstratives ríno and ríya will therefore represent any of the demonstratives formed on these patters, and will include dzíno and dzíya, úno and úya, etc.

[3] The morpheme -é- is always preceded by anagreement prefix, determined by the noun class of the head noun of the phrase; thus, murúmé wé-chikóro 'man of the school'; varúmé vé-chikóro 'men of the school'.

4 If a string is scanned for compatibility with a rule and any segment in that string is marked as a contextual exception to the rule, the rule will not apply. If a segment is the string is marked as a focal exception, then that rule will be blocked only if the segment is being scanned as focus for that rule. An alternative to the rule proposed here is to introduce a focal exception feature onto the H tone of the morpheme before the three crucial morphemes, by a readjustment rule such as the following.

$$H = [\text{-focus Sandhi Lowering}] \;/\; [_{NP}\ [\text{+seg}]_{o} \;\_\_\; \begin{Bmatrix} \text{-é-} \\ \text{ríya} \\ \text{ríno} \end{Bmatrix}$$

This solution accounts for the same data as rule (12).

5 The principles which govern the distribution of H and L tones on the prefix -ḗ- are explained in Odden (in progress).

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