

# Coalescence and Feature-Sensitive Elision

## 3.1 COALESCENCE

### 3.1.1 Symmetric Coalescence: Afar

A process that seems closely related to vowel elision, and often co-occurs with it, is coalescence. An example of a language with this process is Afar, an Afro-Asiatic language described in Bliese (1981). In this language, the input sequences /e+u/ and /u+e/ are both realized as [o:]. Although, Bliese does not actually give examples involving /e+u/ or /u+e/ sequences, he is quite explicit in claiming (1981:223) that both sequences are realized as (long) [o]: "All the combinations involve complete assimilation of the less dominant vowel to the more dominant, except /eu/ combinations which become long [o], preserving the height of /e/ and the rounding of /u/. Vowel length or sequential order do not affect the assimilations."

Like elision, coalescence involves failure to preserve some vowel features of the input, e.g. realization of /e+u/ or /u+e/ as [o:] in Afar involves loss of [+high] and [front]. The difference is that, whereas in the case of elision, all the unpreserved features belong to the same vowel, coalescence involves loss of (and preservation of) some features of each vowel. We might contrast the two processes by saying that whereas elision is (at least in the typical cases we have considered so far) position-sensitive, targeting the features that occupy a particular

position, coalescence is feature-sensitive, preserving certain feature values in preference to others. In the fully symmetric form that it takes in Afar, coalescence takes no regard of the position ( $V_1$  or  $V_2$ ) in which the features originate: the pair of vowels /e,u/ has the same realization in either input order.

Symmetric coalescence of this type is predicted to be possible under fairly standard assumptions of Optimality Theory. What is crucially required is that  $\text{PARSE}(F)$  constraints referring to particular features may be ranked with respect to each other, i.e. a language may preserve certain features in preference to others. In Afar, for example, we require that [-high] is preserved in preference to [+high], while [round] is preserved in preference to [front]:

- (110) Afar rankings:  
 a.  $\text{PARSE}(-\text{high}) \gg \text{PARSE}(+\text{high})$   
 b.  $\text{PARSE}(\text{round}) \gg \text{PARSE}(\text{front})$

Within a framework that makes use of position-sensitive  $\text{PARSE}(F)$  constraints, the analysis of symmetric coalescence is slightly more complicated, however. In particular, it is not sufficient that  $\text{PARSE}(-\text{high})$  be ranked above  $\text{PARSE}(+\text{high})$ . The fact that the realization of a sequence like /e#u/ as [o:] violates not only  $\text{PARSE}(+\text{high})$  but also  $\text{PARSE}(+\text{high})_{[\text{w}]}$  requires the ranking  $\text{PARSE}(-\text{high}) \gg \text{PARSE}(+\text{high})_{[\text{w}]}$ . Similarly, the fact that the realization of the sequence /u#e/ as [o:] violates not only  $\text{PARSE}(\text{front})$  but also  $\text{PARSE}(\text{front})_{[\text{w}]}$  requires the ranking  $\text{PARSE}(\text{round}) \gg \text{PARSE}(\text{front})_{[\text{w}]}$ . Henceforth, I refer to this type of situation, in which there is one or more crucial rankings of the form  $\text{PARSE}(F) \gg \text{PARSE}(G)_P$  (where F and G may be either different features or opposite values of the same feature and where P refers to a particular prominent position, e.g. word-initial) as *interleaving*. Notice that this type of ranking does not violate the proposed universal ranking schema  $\text{PARSE}(F)_P \gg \text{PARSE}(F)$ , under the reasonable assumption that this schema only applies to constraints that refer to the same feature, i.e. it says nothing about the relative ranking of  $\text{PARSE}(F)_P$  and  $\text{PARSE}(G)$ , where F and G are different features (or opposite values of the same feature).

Notice that the rankings  $\text{PARSE}(-\text{high}) \gg \text{PARSE}(+\text{high})_{[\text{w}]}$  and  $\text{PARSE}(\text{round}) \gg \text{PARSE}(\text{front})_{[\text{w}]}$  make other predictions as well. For example, they dictate (assuming, as in fact we must, that superordinate constraints rule out front rounded vowels in Afar) that the input sequences /e+o/ and /o+e/ will both be realized as [o:]; this is shown in (111) and (112). (To save space in listing the constraints in these and subsequent tableaux, I abbreviate  $\text{PARSE}$  as just P. The notation o(-hi<sub>1</sub>) in (111) describes a candidate, phonetically [o], in which the specification [-high] originates in the underlying  $V_1$ , i.e. the outcome is the result of coalescence. Similarly, the candidate o(-hi<sub>2</sub>) in (112) describes a phonetic output candidate [o] in which the specification [-high] originates in the underlying  $V_2$ . Notice that although the realization of /o+e/ as [o:] appears superficially to involve  $V_2$  elision, the winning candidate in (112) actually involves coalescence, since the [-high] specification that survives in the output is the one that originated in  $V_2$ .)

	/e+o/	P(-hi) <sub>1</sub> -[w]	P(md)-[w]	P(-hi)	P(md)	P(+hi) <sub>1</sub> -[w]	P(tr)-[w]
(111)	<e>o			*			
⇒	e<o>	*	*	*	*		
	o(-hi <sub>1</sub> )	*		*			

	/o+e/	P(-hi) <sub>2</sub> -[w]	P(md)-[w]	P(-hi)	P(md)	P(+hi) <sub>2</sub> -[w]	P(tr)-[w]
(112)	<o>e			*	*		
⇒	o<e>	*		*		*	*
	o(-hi <sub>2</sub> )			*			*

That the input sequences /e+o/ and /o+e/ are in fact realized as [o:] is shown by examples like the following:

- (113) a. daro exe → darooxe  
 'I gave grain'  
 b. diidaale oobbe → diidaalooobbe  
 'I heard a bee'

We have seen that surface realizations in Afar involving the pairs of input vowels /e/ and /o/ or /e/ and /u/ do not depend on the linear order of the vowels in the input. This turns out to be true in fact for all

other input sequences in Afar as well. This is shown in (114), which gives the full set of realizations for all possible combinations of Afar vowels:

- (114) iV, Vi → V (where V is /a/, /e/, /o/, or /u/)  
 eV, Ve → V (where V is /a/ or /o/)  
 eu, ue → o  
 uV, Vu → V (where V is /a/ or /o/)  
 oa, ao → a

Actual examples illustrating some of these realizations at lexical word boundaries are given in (115).<sup>2</sup>

- (115) a. cissi eedje → cisseeđeje  
 'I knew the hill'  
 b. cale irgice → calergice  
 'I cut a mountain'  
 c. daro exe → darooxe  
 'I gave grain'  
 d. diidaale oobbe → diidaaloobbe  
 'I heard a bee'  
 e. kimmiro urte → kimmirorte  
 'the bird got well'  
 f. anu okme → anokme  
 'I ate'  
 g. daro akme → darakme  
 'I eat grain'  
 h. adeena uble → adeenable  
 'toothbrush I saw'

In order to complete the analysis of Afar, we may note that any combination involving the vowel /a/ is realized as [a], i.e. /a/ takes precedence over any other vowel. This can be accounted for by assuming that PARSE(low) is ranked above PARSE(front)-[w], PARSE(round)-[w], and PARSE(+high)-[w] (this will of course entail that PARSE(low)-[w] is also ranked above these three constraints, given the universal ranking schema PARSE(F)-[w] >> PARSE(F)), provided we further assume (as indeed we must) that the features [front] and [round] are incompatible with [low] in Afar, in keeping with the following undominated constraints:

- (116) \*D A vowel should not be both [round] and [low] (Kaun 1995).  
 \*æ A vowel should not be both [front] and [low].

([+high], on the other hand, is assumed to be universally incompatible with [low].) Given these assumptions, and provided that the other hiatus constraints ONSET, \*INS(F), \*DIP, and \*CG are ranked above all relevant PARSE constraints, we now correctly predict that both /V<sub>i</sub>##a/ and /a##V<sub>i</sub>/ will always be realized in Afar as [a]. I illustrate this for a few sequences in (117).

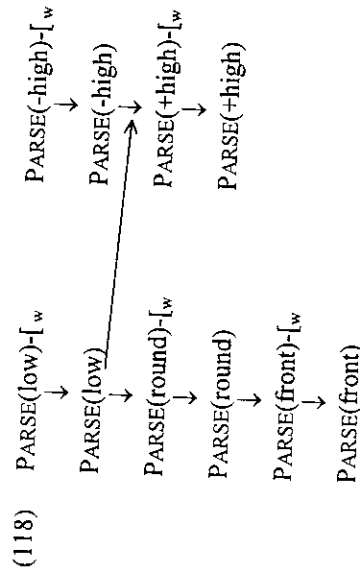
- (117)
- |    |        |    |           |       |            |           |       |
|----|--------|----|-----------|-------|------------|-----------|-------|
| a. | /a##e/ | *æ | P(lo)-[w] | P(lo) | P(+hi)-[w] | P(fr)-[w] | P(fr) |
| ↑  | <a>e   |    |           | *     |            | *         | *     |
|    | a<e>   |    |           |       |            |           |       |
|    | æ      | *  |           |       |            |           |       |
- 
- |    |        |    |           |       |            |           |       |
|----|--------|----|-----------|-------|------------|-----------|-------|
| b. | /e##a/ | *æ | P(lo)-[w] | P(lo) | P(+hi)-[w] | P(fr)-[w] | P(fr) |
| ↑  | e<a>   |    | *         | *     |            |           | *     |
|    | <e>a   |    |           |       |            |           |       |
|    | æ      | *  |           |       |            |           |       |

	/a##u/	*b	P(lo)-[w]	P(lo)	P(+hi)-[w]	P(md)-[w]	P(md)
c.	<a>u			*			
⇒	a<u>				*	*	*
	o			*	*		
	ɒ	*			*		

	/u##a/	*b	P(lo)-[w]	P(lo)	P(+hi)-[w]	P(md)-[w]	P(md)
d.	u<a>		*	*			
⇒	<u>a						*
	o		*	*			
	ɒ	*					

The full set of PARSE rankings for word boundary contexts in Afar may be summarized as in (118).



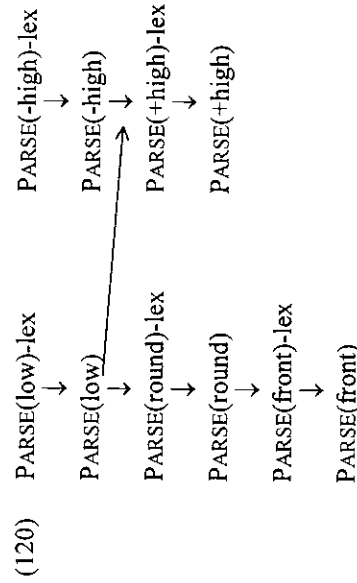
In addition to the cases we have examined directly, these rankings correctly yield all of the other Afar outcomes schematized in (114). For example, the fact that both  $\text{PARSE}(+high)\text{-}[w]$  and  $\text{PARSE}(front)\text{-}[w]$  are dominated by (general)  $\text{PARSE}(F)$  constraints for all features with which [+high] and [front] are in direct competition (i.e. [-high] and [low] in the case of the former and [round] and [low] in the case of the latter) entails that the vowel /i/ necessarily loses out to all other vowels. (Verification that the analysis yields the correct outcomes for the remaining sequences is left to the reader.)

Finally, although the examples we have seen so far all involve hiatus at word boundaries, the elision patterns in (114) also apply at

stem-suffix and suffix-suffix boundaries in Afar, as illustrated in the additional examples in (119):<sup>3</sup>

- (119)
- a. rabbi-ow → rabbow  
'master'
- b. urru-ow → urrow  
'children'
- c. sool-á-u-k → soolak  
'standing'
- d. rad-a-i-h → radah  
'while descending'

The fact that the stem-suffix context displays the same kind of "mirror-image" behavior as is evident at word boundaries requires an interleaving of  $\text{PARSE}(F)$  and  $\text{PARSE}(F)\text{-lex}$  constraints (the latter being violated by  $V_1$  elision in this context) that is exactly analogous to the interleaving of  $\text{PARSE}(F)$  and  $\text{PARSE}(F)\text{-}[w]$  constraints given in (118), i.e. we have the additional rankings in (120):



That there are separate  $\text{PARSE}(F)$  constraints corresponding to individual features seems to be well-established. Once the need for position-sensitive constraints like  $\text{PARSE}(F)\text{-}[w]$  is recognized, the possibility of ranking a particular constraint  $\text{PARSE}(F)\text{-}P$  above a different constraint  $\text{PARSE}(G)\text{-}Q$ , where  $F$  and  $G$  are different features and  $P$  and  $Q$  are different (possibly null) positional specifications,

becomes quite natural. If anything, what is more surprising than the existence of languages like Afar, which make use of this possibility, is the fact that such languages appear to be relatively rare. The far more common state of affairs seems to be for the target of elision to depend primarily on the positions in which the vowels appear, and not, as in Afar, entirely on their featural identities. Tentatively, I propose that the relative markedness of symmetric, feature-sensitive coalescence is due to a default UG ranking, for each position P, of all PARSE(F)-P constraints together in a contiguous block. The possibility of interleaving two families of constraints, i.e. of a feature-sensitive ranking  $\text{PARSE(F)-P} \gg \text{PARSE(G)-Q}$  in place of a more general ranking  $\text{PARSE(F)-P} \gg \text{PARSE(F)-Q}$  that applies to every feature, is only entertained by the language learner in the face of positive evidence.

### 3.1.2 Asymmetric Coalescence

Fully symmetric coalescence of the type found in Afar appears to be cross-linguistically rare. More frequently, coalescence only applies when a sequence of input vowels occurs in a particular order. This may be illustrated with reference to a very common form of coalescence in Niger-Congo languages, in which the sequences /a+i/ and /a+u/ are realized as [e] (or, in some languages, [ɛ]) and [o] (or [ɔ]) respectively. Such a process occurs for example in Xhosa, as seen in the following data, from Aoki (1974):

- (121)
- |                   |   |            |
|-------------------|---|------------|
| a. wa-inkosi      | → | wenkosi    |
| ‘of the chiefs’   |   |            |
| b. na-impendulo   | → | nempendulo |
| ‘with the answer’ |   |            |
| c. wa-umfazi      | → | womfazi    |
| ‘of the woman’    |   |            |
| d. na-um-ntu      | → | nomntu     |
| ‘with the person’ |   |            |

"Height coalescence" of this sort will be discussed in considerable detail below. What is important for our present purposes is that the process is usually not symmetric: the reverse sequences /i+a/ and /u+a/

do not undergo coalescence to [e] and [o], but are typically resolved instead by either glide formation or vowel elision. In the case of Xhosa, both of these possibilities are attested: /u+a/ undergoes glide formation, while /i+a/ is apparently generally subject to V<sub>1</sub> elision.<sup>4</sup> This is illustrated in the additional data below (from Aoki (1974) and McLaren (1955)):

(122) Glide formation with /u+a/:

- |               |   |           |
|---------------|---|-----------|
| a. uku-ahluha | → | ukwahlula |
| ‘to divide’   |   |           |
| b. uku-amkela | → | ukwamkela |
| ‘to receive’  |   |           |

V<sub>1</sub> elision with /i+a/:

- |             |   |        |
|-------------|---|--------|
| c. ndi-akha | → | ndakha |
| ‘I build’   |   |        |
| d. ni-enza  | → | nenza  |
| ‘you make’  |   |        |

I propose that this type of process, which I refer to hereafter as asymmetric coalescence, represents a case that is intermediate between symmetric coalescence of the Afar sort, which subordinates positional factors fully to a preference for particular feature values over others, and ordinary elision, which typically targets a particular position, regardless of the feature composition of the vowel which occupies that position (modulo the case where vowels specified for certain features, e.g. [+high], are preserved through glide formation). My claim is that asymmetric coalescence is sensitive to both feature content and position. The type of height coalescence found in Xhosa and many other languages, for example, respects the following generalizations:

1. Feature Preservation Preference: [-high] is always preserved in preference to [+high], so that if either input vowel is [-high], the phonetic result will also be [-high].
2. Position Preservation Preference: Otherwise, all features of V<sub>2</sub> are preserved in preference to those of V<sub>1</sub>. (Here I assume a

context, e.g. prefix + root, as in the Xhosa examples above, that favors preservation of  $V_2$  rather than  $V_1$ .)

The second of these generalizations manifests itself in two ways. First, in cases where  $V_2$  is non-high to begin with, or where both vowels are [-high] (i.e. in all cases other than those where  $V_1$  is non-high and  $V_2$  is high), the result is straightforward elision of  $V_1$  (or, in some languages, glide formation). In the case of a language with a five-vowel system like Xhosa, for example, we have the realizations in (123). (Here the parenthesized glides indicate the possibility of glide formation in some languages of this type.)

- (123)
- |         |            |            |            |            |
|---------|------------|------------|------------|------------|
| a+e > e | e+a > a    | o+a > (w)a | i+a > (y)a | u+a > (w)a |
| a+o > o | e+o > (y)o | o+e > (w)e | i+e > (y)e | u+e > (w)e |
|         |            | i+o > (y)o | u+o > (w)o | u+i > (w)i |
|         |            |            | i+u > (y)u |            |

Second, in cases where coalescence does occur, [-high] is the *only* feature of  $V_1$  that is preserved. All other features of the output, in particular its frontness/roundness, are drawn from  $V_2$ .

It is worth emphasizing that from the viewpoint of the theory offered here, symmetric coalescence, asymmetric coalescence, and elision are not three disparate phenomena, but simply represent different points on a continuum ranging from a situation in which position-sensitivity is fully determinate (giving ordinary vowel elision), to one in which both positional and featural preferences play a role (asymmetric coalescence), to one in which position-sensitivity is fully subordinated to a preference for preservation of particular features (symmetric coalescence). This contrasts with the view expressed by Haas (1988b), who treats coalescence as a fundamentally different process that must be handled by a novel formal mechanism not required for any other process. At the same time, we may agree with Haas' contention that symmetric coalescence processes do in fact pose a serious problem for the standard formal devices of rule-based phonology. It appears, then, that the present Optimality-Theoretic analysis is the first to provide an empirically adequate account in which all three processes are given a unified treatment using the same formal mechanisms, viz. alternative rankings of position-sensitive and feature-

sensitive PARSE constraints. The effects of these alternative rankings are summarized below:

(124)

Ranking	Result
position-sensitive constraints dominate	ordinary elision
both position-sensitive and feature-sensitive constraints play a role	asymmetric coalescence
feature-sensitive constraints dominate	symmetric coalescence

The formal account of asymmetric coalescence within the present framework is straightforward. Assuming that we are dealing, as in the Xhosa examples above, with a prefixal context, the Feature Preservation Preference (generalization 1 above) for [-high] must be encoded by means of a ranking  $\text{PARSE}(-\text{high}) \gg \text{PARSE}(+\text{high})\text{-lex}$ . The effect of this ranking on an input sequence /a+i/ is illustrated in (125), where I use the Notation F' to stand for features other than [high], i.e.  $\text{P}(\text{F}')$  represents the constraints  $\text{PARSE}(\text{round})$ ,  $\text{PARSE}(\text{front})$ , and  $\text{PARSE}(\text{low})$ , which, based on the available evidence, are not crucially ranked with respect to each other.

(125)

/a+i/	$\text{P}(-\text{high})$	$\text{P}(+\text{high})\text{-lex}$	$\text{P}(\text{F}')\text{-lex}$	$\text{P}(\text{F}')$
<a>i	*			**
a<i>		*	*	**
e		*		**

⇒

By contrast, this same ranking gives ordinary  $V_1$  elision, rather than coalescence, with the reverse input sequence /i+a/:

(126)

/i+a/	$\text{P}(-\text{high})$	$\text{P}(+\text{high})\text{-lex}$	$\text{P}(\text{F}')\text{-lex}$	$\text{P}(\text{F}')$
i<a>	*			**
<i>a		*	*	**
e		*		**

⇒

I emphasize once again that the ranking  $\text{PARSE}(-\text{high}) \gg \text{PARSE}(+\text{high})\text{-lex}$  does not contradict the posited universal ranking  $\text{PARSE}(\text{F}')\text{-lex} \gg \text{PARSE}(\text{F})$ , which I take to be a schema that properly



type. In any language in which vowels merge, I propose that the constraint which is violated is a type of "all or none" constraint (Steriade 1995) that disprefers partial loss of a segment:

- (130) SEGMENT INTEGRITY (SEGINT) If one feature of a segment is preserved, all its features are preserved.

SEGINT has not played a crucial role in accounting for the languages we have seen so far. In languages with coalescence (whether symmetric or asymmetric), this constraint is freely violated. In languages with elision only, SEGINT is never violated. In this latter case however we are not necessarily forced to attribute this fact to an undominated ranking of SEGINT, since the absence of one or more interleaved rankings (which we have taken to be marked) would be sufficient to account for the lack of coalescence in such a language. There is however one ranking (not so far considered) involving SEGINT that does have significant empirical consequences. Where a language does have PARSE(F) interleaving, and where SEGINT is moreover undominated, we predict a type of elision that we have not so far encountered, in which certain input vowels are always preserved in preference to others, regardless of the positions which they occupy in the input. Suppose for example a language with the interleaved ranking in (131). (I further assume, for the sake of concreteness, that we are dealing with a lexical word boundary context.)

- (131) PARSE(low)-[<sub>w</sub>]  
 ↓  
 PARSE(low)  
 ↓  
 PARSE(round)-[<sub>w</sub>]  
 ↓  
 PARSE(round)  
 ↓  
 PARSE(-high)-[<sub>w</sub>]  
 ↓  
 PARSE(-high)  
 ↓  
 PARSE(front)-[<sub>w</sub>]  
 ↓  
 PARSE(front)  
 ↓  
 PARSE(+high)-[<sub>w</sub>]  
 ↓  
 PARSE(+high)

If SEGINT is ranked below all the PARSE constraints, this type of ranking gives rise to the type of symmetric coalescence seen in the case of Afar /e+u/ and /u+e/ above, in which the output vowel simply selects the most highly preferred set of compatible features from both input vowels. In a language in which SEGINT is undominated, on the other hand, recombination of features originating in different vowels will be impossible, so that what we will wind up with instead is a kind of "strength hierarchy," in which certain vowels will always be selected in preference to others, the winning vowel for any competing pair of input vowels being the one which has the most highly valued feature(s). Assuming a language with a five-vowel system, for example, the ranking in (131) will give rise to the following strength hierarchy:

- (132) Weakest Strongest  
 \_\_\_\_\_  
 i   e   u   o   a

For any given pair of input vowels, the phonetic result will always be the stronger of the two vowels, regardless of their original input order.

This is illustrated below for the sequences /e+u/ and /u+e/. Notice here that although in both cases the candidate [o] is optimal with respect to the PARSE constraints alone, it loses out because of the undominated position of SEGINT, which it violates.

(133)

/e##u/	SEG	P(md)	P(-hi)	P(+hi)	P(+hi)
	INT	-[w]	-[w]		
<e>u			*		
e<u>	*	*		*	*
o	*			*	*

(134)

/u##e/	SEG	P(md)	P(-hi)	P(+hi)	P(+hi)
	INT	-[w]	-[w]	-[w]	
u<e>			*		
<u>e	*	*		*	*
o	*			*	*

An example of a language which exhibits exactly this type of behavior is Modern Greek. According to Kaisse (1977), most dialects of Modern Greek have precisely the strength hierarchy in (132) (and therefore, we may assume, the constraint ranking in (131)).<sup>5</sup> Some illustrative examples (from Kaisse 1977:5.6) are given in (135) (some of Kaisse's symbols have been changed to IPA symbols):

- (135) a. ta éxo → táxo  
 them I have
- b. me aχapái → maχapái  
 me he loves
- c. ta onirévome → tanirévome  
 them I dream
- d. to aIázo → talázo  
 it I change
- e. to urliázi → torliázi  
 it he howls

- f. tu oðiyó → toðiyó  
 to him I lead
- g. to éðosa → tóðosa  
 it I gave
- h. me oðiyí → moðiyí  
 me he leads
- i. me íde → méde  
 me he saw

We have identified four different possible hiatus outcomes involving loss of input vowel features: ordinary (position-sensitive) elision, feature-sensitive elision, symmetric coalescence, and asymmetric coalescence. The first, and most common, of the four processes is ordinary elision. This will occur when there is no interleaving of PARSE(F) constraints. Full interleaving gives rise to either symmetric coalescence or feature-sensitive elision; the former will occur when SEGINT is dominated by the relevant PARSE constraints, while the latter will arise where SEGINT is undominated. Finally, asymmetric coalescence occurs with partial interleaving of the PARSE(F) constraints in combination with dominance of these constraints over SEGINT. These different possibilities are summarized in the chart below:

(136)

Degree of inter-leaving	SEGINT ranking	Result
none	SEGINT >> PARSE constraints	elision
none	PARSE constraints >> SEGINT	elision
partial	SEGINT >> PARSE constraints	?
partial	PARSE constraints >> SEGINT	asymmetric coalescence
extensive	SEGINT >> PARSE constraints	feature-sensitive elision
extensive	PARSE constraints >> SEGINT	symmetric coalescence



PARSE(round) >> PARSE(low)-[<sub>w</sub>] which is apparently required by the dominance of /o/ over /a/ in the hierarchy should predict, contrary to fact, that /u/ (which is [round]) should also win out over /a/.<sup>6</sup> Yoruba departs from the pattern in (137) and (138) in that /u+i/ is realized in Yoruba as [u] rather than [i]. Although adopting an additional interleaved ranking PARSE(round) >> PARSE(front)-[<sub>w</sub>] would correctly yield realization of /u+i/ as [u], this would generate a pattern which differs from that of Yoruba in other respects. In particular, such a ranking would cause /o+e/ to be realized as [o] (assuming, as we have seen, that SEGINT is undominated), whereas the attested realization of /o+e/ in Yoruba is [e].

CHAPTER 4  
**Height Coalescence**

**4.1 TWO TYPES OF HEIGHT COALESCENCE**

Given the definition of coalescence as a situation in which an underlying /V<sub>1</sub>+V<sub>2</sub>/ sequence is realized as a third vowel sharing features of both V<sub>1</sub> and V<sub>2</sub>, there are quite a few logically possible patterns of coalescence that might conceivably occur. There is one type however that seems to occur with particularly great frequency. This is a type of coalescence (henceforth referred to as "height coalescence") which applies only to sequences in which V<sub>1</sub> is non-high and V<sub>2</sub> is high (or, in some instances, a mid vowel which is nevertheless higher than V<sub>1</sub>). The phonetic result of this type of coalescence is always a non-high vowel with the frontness and roundness of V<sub>2</sub>.

Height coalescence occurs in two main varieties. The first type, which I refer to as "e-coalescence," most typically involves the realization of /a+i/ as [e] and/or /a+u/ as [o]. In many languages, some or all of the additional realizations in (139) may occur as well.<sup>1</sup> (The parenthesized glides in (139) indicate that the input sequences /o+i/ and /e+u/ will, in some languages, be realized with glide formation in addition to coalescence, e.g. the sequence /o+i/ is realized in Nawuri as [we].)

- (139)    a+i > e            a+u > o  
           e+i > e            e+u > (y)o  
           o+i > (w)e        o+u > o