Studies in African Linguistics is published three times a year. Occasional supplements are published at irregular intervals and are available to current subscribers at reduced rates. Contributors please see "Guideline for Contributors" inside the back cover. All correspondence and contributions to the journal should be sent to

Subscriptions: Individuals: $12.00 per year, $22.00 for two years.

Institutions: $20.00 per year

Single issue: $7.00 for single back issues

Supplements: $12.00 (if ordered separate from subscription)

(Add $15.00 per year for overseas Air Mail subscriptions.)

Make checks payable to the Regents of the University of California.

TABLE OF CONTENTS

STUDIES IN AFRICAN LINGUISTICS

Published by the Department of Linguistics
and the African Studies Center
The University of California, Los Angeles

UNDERSPECIFICATION AND LOW VOWEL HARMONY
IN OKPE*

Douglas Pulleyblank
University of Southern California

This paper examines the effect of [ATR] vowel harmony on
low vowels in Okpẹ, an Ẹdoid language of Nigeria. The
relevant facts can be summarized as follows: Low vowel
stems condition [-ATR] forms on affixes. Low vowel af-
fixes surface as [+low] in [-ATR] contexts and as [-low]
when in [+ATR] contexts. Of particular interest is the
additional fact that an underlyingly low vowel surfaces
as [-low], [-*ATR*] in certain [+ATR] environments. To
explain these alternations, it will be argued that low
vowels are underlyingly unspecified for vocalic fea-
tures. Redundancy rules, supplied for the most part by
Universal Grammar, interact with the vowel harmony sys-
tem and rules of syllabification to derive the non-low
variants of underlyingly low vowels. By positing under-
specified forms, it will be shown that no ad hoc rules
need to be stipulated.

1. Introduction

The set of vowels that are active in vowel harmony alternations often con-

stitutes only a subset of the complete set of vowels found in a particular

language. For example, in Akan [Clements 1981], the vowels affected by

[ATR][1] harmony are the non-low vowels; in Yoruba [Awobuluyi 1967, Bamgbose

---

[1]The feature [ATR] refers to "advanced tongue root" or "expanded pharynx".
For a discussion of the phonetic parameters of this feature, see Lindau
[1979]; for an illustrative example of the phonological use of the feature,
see Clements [1981].

1967], the vowels affected by [ATR] harmony are the non-low, non-high vowels
(that is, mid). Okpẹ, an Ẹdoid language of Nigeria, is particularly interest-
ing in this regard. Phonetically, only non-low vowels appear in [+ATR]/[-ATR]
pairs. Phonologically, however, there is evidence to show that low vowels do
indeed participate in the system of vowel harmony. Specifically, the [-ATR]
vowel [a] has a [+ATR] variant [e] in certain environments (as in the pre-
fix of (1b)), and a [+ATR] variant [ẹ][2] in others (such as in the suffix of
(1b)):

(1) a. [-ATR] stem: /a+sʉ+a/ → [á !swá]   'we (inclusive) are singing'
    b. [+ATR] stem: /a+ru+a/ → [é !rwẹ́]   'we (inclusive) are doing'

The latter fact is particularly surprising since [ẹ] is a [-ATR] vowel.
That is, a situation is created in an example like (1b) where a [-ATR] vowel
patterns as the [+ATR] counterpart of a phonologically low vowel.

There are two basic approaches to be taken for this type of problem. On
the one hand, one could assume that such facts simply represent an odd idio-
syncracy of Okpẹ. Under such an approach, one would simply formulate two ad
hoc rules whose specific functions would be to change an [a] into an [e]
and an [a] into an [ẹ] . Alternatively, one could look for an explanation
of the low vowel behaviour by examining the interaction of well-motivated lan-
guage-particular rules of Okpẹ with general principles of Universal Grammar,
attempting to avoid positing any special ad hoc rules specifically formulated
to describe changes such as those observed above.

In this paper, I provide an account of the low vowel behaviour of Okpẹ
that adopts the second strategy, with two sets of assumptions being crucial:
(1) The theory of underspecification is adopted, and it is argued that low
vowels are underlyingly unspecified for vocalic features in Okpẹ. The deriva-
tion of the particular phonetic form of such an underspecified vowel involves
the interaction of a number of factors including the assignment of syllable

---

[2]Orthographic conventions used in this paper include the following: ẹ =
[ɛ] , ọ = [ɔ] , ị = [ɪ] , u = [o] , ˜ = Nasalization, ′ = H-
tone, ` = L-tone and ! preceding a syllable = Downstep on that syllable.

structure and specifications of vowel harmony. (2) I assume a process of re-syllabification for certain cases that violate syllabic constraints of Okpẹ. Crucially, such resyllabification involves two stages: (i) deletion of exist-ing syllabic structure and (ii) reapplication of the regular rules of syllabi-fication. These assumptions account for the structure-preserving nature of Okpẹ resyllabification, that is, for the fact that the syllable types created by resyllabification are the same as those created by the initial application of the regular rules.

It seems improbable that a theory of phonology should allow rules as un-likely as one which supplies a [-ATR] vowel as the [+ATR] counterpart for a low vowel. The fact that this paper accounts for such a surface alternation without requiring the positing of such an odd rule is interpreted as support for the basic assumptions that make such a result possible.

2.   Harmony in Okpẹ: The Problem[3]

With respect to non-low vowels, Okpẹ has a straightforward system of root-controlled dominant [ATR] harmony. Stems belong to either the [+ATR] or the [-ATR] class, while affixes are generally unspecified for the feature [ATR], receiving their [ATR] specifications from the stem. For example, the infini-tive prefix [e/ẹ] appears with its [+ATR] variant [e] in combination with a [+ATR] stem, as in (2), while it appears with its [-ATR] variant [ẹ] in combination with a [-ATR] stem, as in (3):

(2) a. /i/   tí   'pull!'   ètyó   'to pull'
    b. /e/   sé   'fall!'   èsé   'to fall'

_____

[3]In this paper, I sidestep the interesting rule of phonetic neutraliza-tion that merges [i̧] with [e] and [u̧] with [o]. Such neutralization has been discussed by Hoffmann [1973] and the reader is referred to that pa-per. Note, however, that in a preliminary acoustic study of Okpẹ and the closely related language Uvwiẹ [Omamor 1973] there is some indication of a phonetic distinction between even the [+high, -ATR] and [-high, +ATR] pairs (the pairs that undergo neutralization), the distinction being more apparent in Uvwiẹ. Whatever the precise phonetic facts are, I abstract away from this issue here. This means that "surface" forms in this paper are one step away (at least) from phonetic reality.

c.	/o/	só	'steal!'	èsó	'to steal'
d.	/u/	rú	'do!'	èrwó	'to do, make'

(3)	a.	/i̹/	ri̹	'eat!'	è̹ryó̹	'to eat'
	b.	/e̹/	de̹	'buy!'	è̹de̹	'to buy'
	c.	/o̹/	ló̹	'grind!'	è̹ló̹	'to grind'
	d.	/u̹/	sú̹	'sing!'	è̹swó̹	'to sing'

Note that in the above examples, a suffix [o/o̹] appears in addition to the prefix in all cases where the stem vowel is high (see section 4.4.1 below). As with the infinitive prefix, this suffix appears with its [+ATR] variant [o] if the stem belongs to the [+ATR] class and with its [-ATR] variant [o̹] if the stem belongs to the [-ATR] class.

Turning to the harmonic behaviour of the low vowel [a], the first observation to be made is that stems with the vowel [a] condition [-ATR] harmony:

(4)	a.	/a/	dá	'drink!'	è̹dá	'to drink'
	b.	/ã/	dã́	'fly!'	è̹dã́	'to fly'

In examples such as the above, where the absence of the infinitive suffix is accounted for by the non-high nature of the stem vowel, it is impossible for the [+ATR] variant of the infinitive prefix to appear: *[èdá], *[èdã́]. In a related manner, phonetic low vowels in prefixes cooccur only with [-ATR] stems, as in the example à dárí 'we (inclusive) drank'. When such a prefix occurs with a [+ATR] stem, it appears on the surface as [e], as in the following example: è tírí 'we (inclusive) pulled'. Hence we observe that the [+ATR] variant of [a] in prefixes is [e]. Note moreover that the vowel in such a case must be underlyingly low and not mid. The distinction between the pairs [e/e̹] and [e/a] is neutralized for the [+ATR] variants; the [-ATR] variants, which remain distinct, show the underlying contrast to involve a [-low]/[+low] distinction.

The pattern just described changes, however, when dealing with a V-initial low vowel suffix. When such a low vowel suffix appears with a [-ATR] stem, e.g. su̹ 'sing', the suffix is [a], as expected (5a); but when a low vowel suffix combines with a [+ATR] stem, e.g. ru 'do', then the suffix is

[ę] (5b):

(5) a. á !swá   'we (inclusive) are singing'
    b. é !rwę́   'we (inclusive) are doing'

The process of resyllabification that changes the stem vowels in these cases
into [w] is discussed in section 4.4.1 below. What is crucial for the pres-
ent is the harmonic behaviour of the suffix. In (5a), the suffix appears as
[a] because the stem it attaches to is of the [-ATR] class; in (5b), on the
other hand, the suffix surfaces as [ę] because the stem is of the [+ATR]
class. The essential problem is therefore that such vowels surface as [a]
in [-ATR] contexts, while in [+ATR] contexts, they surface as [e] in a *pre-
fix* and as [ę] in a *suffix*.

3. Theoretical Background: Underspecification

     To account for the harmonic behaviour of low vowels in Okpę, I adopt the
framework of underspecification proposed in Pulleyblank [1983] and Archangeli
[1984]. This framework adopts as a point of departure the requirement that
all redundancy be eliminated from underlying representations (see, for exam-
ple, Kiparsky [1982]). In particular, only non-redundant feature values may
be included in underlying representations; predictable feature values are
filled in by redundancy rules—rules that are of a highly constrained nature.
A central claim of this theory is that most redundancy rules are not language-
specific rules; they are either (a) provided by Universal Grammar (DEFAULT
RULES) or (b) derived by a general principle of Universal Grammar (COMPLEMENT
RULES). It is claimed that Default Rules and Complement Rules do not exhibit
language-specific idiosyncracies, their properties being derived by princi-
ples of Universal Grammar.[4]

3.1. Default and Complement Rules. Several aspects of this theory are im-
portant for the following discussion. First, it is proposed that Universal

---

   [4]For detailed discussion of such redundancy rules, and for the motivation
of the various properties of redundancy rules discussed below, the reader is
referred to Pulleyblank [1983], Archangeli [1984], and Archangeli and Pulley-
blank [in prep].

Grammar provides a context-free default rule for every distinctive feature
[Kiparsky 1982, Pulleyblank 1983]; such default values may, however, be sup-
planted by language-specific "complement" values, themselves determined in
large measure by principles of Universal Grammar [Archangeli 1984]. As a sim-
ple illustration, consider a feature such as [high]. Let us make the substan-
tive assumption that Universal Grammar supplies the value [+high] as the de-
fault specification of [high] for vowels. That is, any vowel that does not re-
ceive the value [-high], either from an underlying assignment through morpho-
logical concatenation or via phonological rule application, is assigned the
value [+high] by default. The immediate implication is that the specification
[+high] will not appear in underlying representations, since such a specifica-
tion would be entirely redundant.

A second point concerns the notion of complement rules. Assume that in a
given language, one must posit the value of [+high] as an underlying specifi-
cation, for example because it occurs as a "floating" feature or because pho-
nological rules crucially refer to that value prior to the stage of complete
specification. In such a case, a complement rule would be established, as-
signing [-high] as the redundant value for the language in question and making
it impossible for the value [-high] to appear underlyingly in that language.
Such a complement rule would take precedence over the default rule otherwise
provided by Universal Grammar. Note that the distinction between default
rules and complement rules is essentially the distinction between "unmarked"
and "marked" redundant specification.

3.2. Default ordering principles. Two potentially contradictory assumptions
have been made in the past about the stage in the derivation at which redun-
dancy rules apply. On the one hand, there is presumably no language whose
phonology exploits the full set of distinctive features made available by Uni-
versal Grammar. Consequently, when features are not used contrastively in a
language's phonology, they are often assumed to be assigned only at the stage
where a phonological string is phonetically interpreted. For example, a fea-
ture such as [suction] [Chomsky and Halle 1968], necessary to distinguish plo-
sives from implosives, plays no role in the phonology of a language like Eng-
lish. It seems fairly safe to assume, therefore, that the value [-suction]

is redundantly assigned to all segments in the phonetic component of English.
In fact, this is more than simply a "safe" assumption; it is necessary in or-
der to account for the fact that such a feature is not only absent from under-
lying specifications, but that in addition, it is never referred to by phono-
logical rules. This would be entirely accidental if the feature value [-suc-
tion] were supplied early on in the phonology of English. That is, features
used contrastively are more likely to be used by the phonological rules of a
language. A principle is required, therefore, that orders redundancy rules
(such as the one assigning [-suction] in English) as late as possible in the
grammar of a language, assigning them to the phonetic component unless there
is evidence for an earlier assignment.[5] Phrasing this constraint in terms of
the morphological and syntactic strata (levels) of lexical phonology, Pulley-
blank [1983] makes the following claim:

(6) Redundancy rules begin their application in the latest possible stratum.

This requirement might be thought to contradict a somewhat different as-
sumption about how redundancy rules must operate. Many earlier approaches,
although implicitly assuming (6), explicitly require that redundancy rules ap-
ply in a block before all other rules of a language's phonology. This re-
quirement, adopted for example in Chomsky and Halle [1968], was largely in an-
swer to problems raised by Lightner [1963] and Stanley [1967] concerning the
possible inadvertent development of a ternary feature system. It is not with-
in the scope of this paper to discuss such problems, but the reader is re-
ferred to Kiparsky [1982] and Pulleyblank [1983] for a demonstration that the
problems raised by Stanley and Lightner do not arise in the type of approach
being taken here. Moreover, Pulleyblank [1983] shows that tonal default rules
may apply as late as the post-lexical and even phonetic components even in
cases where the features concerned *do* play a role in a language's phonology.

---

[5]Halle and Mohanan [1985] propose a general principle that preferential-
ly assigns all phonological rules to the latest stratum possible. The late
ordering of redundancy rules can plausibly be seen as a special case of this
more general constraint.

What can be retained from the hypothesis of early application appears to be
the following [Pulleyblank 1983]:

(7)   Redundancy rules apply as early as possible *within* their stratum.

Because redundancy rules can apply both before phonological rules (as a
result of (7)) and after phonological rules (as a result of (6)), it becomes
possible for them to interact in a number of interesting ways. It is precise-
ly such an interaction that will be shown to account for the behaviour of low
vowels in Okpẹ.

3.3. The Redundancy Rule Ordering Constraint. In line with the general strat-
egy of disallowing language-specific stipulations from being imposed on redun-
dancy rules, it is argued that the types of interactions possible between re-
dundancy rules and phonological rules are of a highly restricted nature. For
example, Pulleyblank [1983] proposes that default rules can never be ordered
by extrinsic language-specific stipulations. Where such rules are inter-
spersed with language-specific rules, the relevant orderings involved are de-
termined entirely by general principles. Of importance to this paper are
cases involving the interaction of (6) and (7), which I refer to collectively
as the Default Ordering Principles, with an additional principle, the Redun-
dancy Rule Ordering Constraint. The Redundancy Rule Ordering Constraint
(adapted from Archangeli [1984]) is given in (8):

(8)   Redundancy Rule Ordering Constraint: A redundancy rule assigning [αF],
      where "α" is "+" or "-", is automatically assigned to the first compo-
      nent in which there is a rule that refers to [αF] in its structural de-
      scription.

A basic effect of the Redundancy Rule Ordering Constraint is to divide
derivations involving any given feature into two stages: (a) an initial, un-
derspecified stage where phonological rules can distinguish between non-redun-
dant specifications and the absence of specification and (b) a subsequent,
fully specified stage where phonological rules can distinguish between "+"
and "-" specifications. The Redundancy Rule Ordering Constraint rules out a
stage in the derivation where, for some feature F, it would be possible to re-

fer to a lack of specification for F while also being able to refer to both
"+" and "-" values of F. To illustrate, consider the interaction of a redun-
dancy rule such as (9) below (assuming for the sake of concreteness that [-ATR]
is the default value assigned by Universal Grammar for [ATR])[6] with a language-
specific rule that refers to [-ATR] in its structural description. Although
the clause of the Default Ordering Principles given in (6) would assign the
[-ATR] default rule (9) as late as possible, the Redundancy Rule Ordering Con-
straint would force it to be assigned to any stratum on which a language-
specific rule referring to [-ATR] applies.

(9) Default [-ATR] Insertion:[7]   [ ] → [-ATR]

Relevant to this effect of the Redundancy Rule Ordering Constraint is the no-
tion of lexical "identity rules". Kiparsky [1982] suggests that the Strict
Cycle Condition [Mascaro 1976] can be derived from the Elsewhere Condition
[Kiparsky 1982] provided that lexical entries be interpreted as identity rules.
This proposal has an interesting effect on the application of redundancy rules.
If some feature value [αF] appears in an underived lexical entry, then the ef-
fect of Kiparsky's proposal is to have the feature in question appear in an
identity rule that applies minimally on the first lexical stratum; by the Re-
dundancy Rule Ordering Constraint, this means that any redundancy rule assign-

---

[6]For a markedness proposal along these lines (although phrased in a rather
different framework), see Kaye et al. [1985].

[7]Because the representation of [ATR] is autosegmental, the rule formula-
tion in (55) is interpreted as follows (where ⓧ indicates a skeletal posi-
tion unspecified for [ATR]):

$$ⓧ → \begin{array}{c} X \\ | \\ [\text{-ATR}] \end{array}$$

The autosegmental interpretation of such a rule is an automatic consequence of
the representation itself (thereby allowing the representation in (9) in the
text); there is therefore no reason to encode such autosegmental properties
into the formulation of the rule. This formulation embodies the claim that
the redundant specification of a feature that is autosegmentally represented
must itself be autosegmental [Pulleyblank 1983, Archangeli and Pulleyblank, in
prep].

ing [αF] must therefore begin its application on the first lexical stratum.

3.4. Repeated application. As a final point, it should be noted that once re-
dundancy rules have begun to apply, they apply at all stages of a derivation,
whenever they can [Pulleyblank 1983]. This is a necessary assumption if we are
to prevent the possibility of phonological rules *deriving* a representation that
includes slots unspecified for F in addition to other slots specified for "+"
and "-" values of F (ternary power).

      To summarize, the Default Ordering Principles assign redundancy rules to
the latest possible stratum, but require that they begin application as early
as possible on the stratum to which they are assigned, after which point their
application is automatic. The basic ordering determined by the Default Order-
ing Principles is supplemented by the Redundancy Rule Ordering Constraint,
which can force redundancy rules to apply earlier than otherwise determined by
the Default Ordering Principles.

      Let us now turn to a discussion of how the above principles apply to the
analysis of Okpẹ.

4. Analysis

4.1. [ATR] harmony. To begin with, I consider the lexical representation of
the feature [ATR] and the basic account of [ATR] harmony. .It is clear, of
course, that there is an [ATR] contrast. Stems such as those in (2) above be-
long to the [+ATR] class while stems such as those in (3) belong to the [-ATR]
class. In principle, the specified value could be either [+ATR] or [-ATR],
with the unspecified value supplied by default. In fact, there is both lan-
guage-internal and cross-linguistic evidence in favour of positing [+ATR] as
the underlyingly specified value. For reasons of exposition, I postpone the
presentation of such evidence until section 4.2.1 and proceed here with the
analysis that follows from the decision to choose [+ATR] as the feature value
represented underlyingly. The first implication is that the appropriate re-
dundancy rule for [ATR] is as given in (9) above, that is, a rule assigning
unspecified segments the value [-ATR].[8] [ATR] harmony is therefore the result

---

[8]I assume that (9) is in fact the default rule provided for the feature

of spreading an underlyingly present [+ATR] autosegment onto unspecified [ATR]-bearing units to its left or right. This can be formalized as follows:[9]

(10) [ATR] Harmony: [+ATR]

                        Conditions: 1. X = rime
             X   (X)   2. mirror image

    The first condition on (10), that the slots relevant to the rule must be rime slots, encodes the fact that ATR Harmony affects vowels, not consonants. Vowels are straightforwardly distinguished from consonants in Okpẹ because all syllables are open and only vowels occupy rime positions. Hence if some segment X is in a rime, then X is a vowel. Note that without information about syllable structure, the distinctive feature composition of a skeletal slot is insufficient to identify a slot as a vowel and therefore insufficient to determine whether the slot is an [ATR]-bearing unit. Vowels and their corresponding glides share general feature specifications as can be determined by the fact that vowels and glides alternate with each other in syllabically defined contexts (see below). The two segment types differ, however, in that vowels alone bear contrastive values for [ATR], that is, vowels alone are [ATR]-bearing units.

    The second condition on [ATR] Harmony (10) serves to specify the bidirectional nature of [ATR] spreading in Okpẹ. That is, a [+ATR] autosegment

---

[ATR] by Universal Grammar (see also Kaye et al. [1985]). If this assumption is incorrect, however, the analysis presented here is completely compatible with (9) being interpreted as a complement rule introduced as a result of [+ATR] being the underlyingly assigned value for Okpẹ.

[9]As pointed out to me by Russ Schuh, it may well be the case that certain aspects of this rule do not need to be stipulated for Okpẹ, as they may constitute the unmarked case for harmony generally. For example, the bidirectional nature of harmony and the fact that harmony assigns [+ATR] to *rimes* might both be considered general properties of harmony systems. In addition, it is a common property of harmony rules that they be root-controlled, this point being captured not in the rule but in the underlying representations in the present analysis. But note that while these three properties are undoubtedly common, they are not required. For example, harmony is autosegmental and directional in Yoruba [Archangeli and Pulleyblank, in prep]; it involves more than just rime slots in Turkish [Clements and Sezer 1982]; it can be determined by affixes in Maasai [Levergood 1984].

spreads to a free rime slot on either its right or left. Note that spreading
is bidirectional but NOT automatic. It will be demonstrated below that
spreading does not apply as the result of a general Well-Formedness Condition,
as originally proposed by Goldsmith [1976], but applies in a rule-governed
fashion at a particular point in the derivation. That is, the facts of harmo-
ny in Okpẹ are shown below to constitute an argument in favour of the version
of the Association Conventions argued for in Pulleyblank [1982, 1983] in which
autosegmental spreading is not governed by an automatic convention. One-to-
one linking is the only automatic aspect of the conventions.

The rules of [ATR] Harmony (10) and Default [-ATR] Insertion (9) derive
the basic harmonic properties of the [+ATR] and [-ATR] stem classes as fol-
lows: first, at the level of the stem, an underlyingly specified [+ATR] auto-
segment links to the stem vowel by left-to-right application of the autoseg-
mental Association Conventions immediately after syllabification. In the fol-
lowing examples, èsé 'to fall' is representative of the [+ATR] class while
ẹ̀dẹ́ 'to buy' is representative of the [-ATR] class; "+A" and "-A" are used in
derivations to represent [+ATR] and [-ATR] respectively, and aspects of the
phonological derivation other than those relating to harmony are ignored.

(11) a.   +A   b.
                 ¦
                 ¦
          C   V   C   V
          │   │   │   │
          s   e   d   ẹ

I analyze [ATR] Harmony in Okpẹ as applying on a non-cyclic stratum [Halle
and Mohanan 1985] and assume, following Pulleyblank [in press], that rule ap-
plication on a non-cyclic stratum consists of two phonological rule applica-
tions (the *Double Scan Hypothesis*), one at the level of the stem and a second
after all affixation has taken place. Hence after affixation has taken place,
syllabification and [ATR] Harmony apply to derive the following:[10]

---

[10]Affixation in these examples would actually involve the addition of both
a prefix and a suffix. The suffix, however, does not surface because of a
process of vowel deletion that is discussed in section 4.4.1.

(12) a.
```
            +A
      ---------¬
    V + C   V
    |   |   |
    e   s   e
```
b.
```
    V + C   V
    |   |   |
    ẹ   d   ẹ
```

Application of Default [-ATR] Insertion in the [-ATR] case then completes the pair of derivations:

(13)
b.
```
         -A
        /|\
    V + C  V
    |   |  |
    ẹ   d  ẹ
```
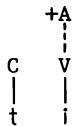
As two additional examples, consider the derivations of tírí 'pulled' and zẹ́rí 'ran', examples that illustrate stems of both harmonic classes in conjunction with a -CV suffix. In such examples, syllabification and the Association Conventions apply at the level of the stem:
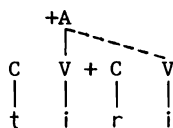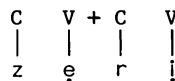
(14) a.
```
    +A
    ┊
  C  V
  |  |
  t  i
```
b.
```
  C  V
  |  |
  z  ẹ
```

After suffixation, syllabification and [ATR] Harmony (10) apply:

(15) a.
```
    +A
    ┌-----¬
  C  V + C  V
  |  |   |  |
  t  i   r  i
```
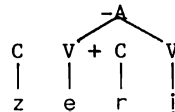b.
```
  C  V + C  V
  |  |   |  |
  z  ẹ   r  i
```

Finally, Default [-ATR] Insertion applies to assign the redundant specification [-ATR] to all unspecified vowels:

(16)
b.
```
         -A
        /|\
  C  V + C  V
  |  |   |  |
  z  ẹ   r  i
```

4.2. <u>Feature representations.</u> Given the above outline of the paradigm cases of harmony, I now turn to a detailed consideration of the feature composition

of Okpẹ vowels in order to explain the special properties of low vowels in
harmonic contexts. In (17) below, I give the values of the features [back],
[round], [high], [low], and [ATR] that are appropriate for fully specified
(pre-neutralization) representations of the nine Okpẹ vowels:

(17) Fully specified feature values for vowels:

	i	ị	e	ẹ	a	ọ	o	ụ	u
BACK	−	−	−	−	+	+	+	+	+
ROUND	−	−	−	−	−	+	+	+	+
HIGH	+	+	−	−	−	−	−	+	+
LOW	−	−	−	−	+	−	−	−	−
ATR	+	−	+	−	−	−	+	−	+

Given the theory of underspecification sketched out in section 3 above, it is
impossible to posit the representations given in (17) as underlying represen-
tations since they contain considerable redundancy. Redundant specifications
must therefore be eliminated from such representations, to be filled in by re-
dundancy rules (default rules and complement rules) at the appropriate point
during the phonological derivation. To begin with, I assume the following
context-free redundancy rules, where (18a, b, d) are default rules and (18c)
is a complement rule:

(18) a. [ ] → [−back]
     b. [ ] → [−round]
     c. [ ] → [−high]
     d. [ ] → [−ATR]

Eliminating such redundant specifications from the representations in (17)
gives the following:

(19)

	i	ị	e	ẹ	a	ọ	o	ụ	u
BACK					+	+	+	+	+
ROUND						+	+	+	+
HIGH	+	+						+	+
LOW	−	−	−	−	+	−	−	−	−
ATR	+		+				+		+

The question of how to eliminate the redundancy in [low] specifications will
be discussed shortly. Before addressing that question, however, I briefly mo-
tivate those aspects of the underspecified representation already given in
(19).

4.2.1. [ATR]. Cross-linguistically, there is evidence to suggest that [+ATR] takes precedence over [-ATR]. For example, in Maasai [Levergood 1984], both stems and affixes may be dominant, in the sense that the ATR specification of a dominant morpheme prevails over the specification of a recessive morpheme. In such a case, it is the value [+ATR] that is associated with such dominant morphemes, with [-ATR] assigned only in cases having neither a [+ATR] stem nor a [+ATR] affix (that is, by default).[11]

With respect to Okpẹ, there are a couple of reasons other than cross-linguistic ones for positing [-ATR] as the redundant specification. First, this assumption allows the general redundancy rule assigning [-ATR] to apply to both low and non-low vowels; if [+ATR] were the redundant value, then a context-sensitive redundancy rule assigning [-ATR] to low vowels would have to be posited in addition to the general rule. The second reason has to do with the behaviour of mid and low vowels in [+ATR] harmonic contexts, behaviour that will be dealt with in detail in sections 4.3 and 4.4 below.

4.2.2. [back]/[round]. Two points are relevant here, namely which feature is selected for inclusion in underlying representations, and which value of that feature is selected. Examination of the feature specifications in either (17) or (19) shows that only one of the two features [back] and [round] is necessary to contrast the various vowels of Okpẹ, and in line with underspecification theory, only one value of the selected feature needs to be included underlyingly. I will first demonstrate below that the non-redundant value for [back] would have to be [+back], and the non-redundant value for [round] would have to be [+round]. Of these two, it will then be suggested in the section dealing with [low] (section 4.2.4) that the non-redundant feature for Okpẹ is [round].[12]

---

[11]See also Kaye et al. [1985] who propose [-ATR] as the unmarked value for [ATR] and develop a theory which (among other things) provides for the dominant nature of [+ATR] specifications.

[12]In adopting the proposal for the selection of [round] over [back], I incorporate certain suggestions made to me by Morris Halle and Moira Yip.

Consider examples such as the following, which involve suffixation of the
past tense morpheme:

(20) a. tí-rí   'pulled'
     b. sé-rí   'fell'
     c. só-rí   'stole'
     d. zé-rị   'ran'
     e. dá-rị   'drank'
     f. wọ́-rị   'took a bath'

In the examples in (20), the past tense suffix harmonizes with the stem with
respect to the feature [ATR] as expected. But if the stem vowel is [+high],
then the suffix also agrees in backness and rounding with the stem:

(21) a. sụ́-rụ́   'sang'
     b. rú-rú   'did'

If the redundant values for [back]/[round] are [-back]/[-round], then the
above distribution is straightforwardly accounted for. The [+back]/[+round]
variants of the suffix are derived by a rule spreading the [+back]/[+round]
specification of the stem if the stem is [+high]; if the stem is not [+high],
then the suffix receives the default values [-back]/[-round]. If, on the oth-
er hand, one were to assume the redundant values to be [+back]/[+round], then
the cases in (20) could only be accounted for by a non-assimilatory rule as-
signing the value [-back] in the following disjunctive environment: (i) after
a [+high, -back/-round] vowel; (ii) after any [-high] vowel. Hence regardless
of cross-linguistic considerations, the values [-back]/[-round] must be redun-
dant in Okpẹ, with the values [+back]/[+round] appearing underlyingly and un-
dergoing spreading.

     Having motivated the feature values for [back]/[round] given in (19), the
question remaining concerns which feature of the two should be included in
underlying representations. I will return to this question immediately after
considering the underlying representations of [high] and [low].

4.2.3. [high]. With respect to [high], there are two basic reasons for pos-
iting [+high] as the non-redundant value. First, as seen in (20) and (21)

above, the rule of round assimilation crucially refers to the value [+high].
Second, the behaviour of vowels under glide formation (resyllabification—see
section 4.4.1 below) also provides evidence for the presence of the specifica-
tion [+high]. When a high vowel and a non-high vowel are adjacent and subject
to glide formation, the loss of syllabic status for the high vowel does not
result in the disappearance of the feature [+high]. On the contrary, the
[+high] specification survives as a glide. The presence of rules crucially
referring to [+high] and the absence of rules referring to [-high] suggest
that [+high] is the underlyingly specified value.

4.2.4. [low]. Finally, turning to the feature [low], we observe in Okpę that
the low vowel is particularly malleable. That is, it is particularly subject
to environmental influences, surfacing as [e] or [ę] in particular con-
texts. It is only vowels that are phonologically low that manifest variation
with respect to their specification for [low], as noted above in section 2.
Such malleability is straightforwardly accounted for if the feature in ques-
tion is not specified at the point in the derivation where the processes cre-
ating contextual variants apply. In other words, such surface variation in un-
derlyingly low vowels suggests that the value [+low] is not present at the
stage in the phonological derivation where rules such as ATR Harmony take
place. I propose therefore that [a] is underlyingly unspecified for [low],
receiving its [+low] specification by a context-free redundancy rule:[13]

(22) [ ] → [+low]

As it stands, however, this analysis would apparently require that all
vowels except [a] be underlyingly specified as [-low]. But this is clearly
unnecessary since many of the [-low] specifications on mid and high vowels are
predictable, and therefore amenable to context-sensitive redundancy rules.

Three points are relevant. First, if a vowel is [+high], then it cannot
be other than [-low] by virtue of the inherent content of the two features:

---

[13]The analysis presented in this section for redundancy rules involving
the feature [low] owes much to discussion with Diana Archangeli.

(23) [+high] → [-low]

Second, if a segment is [+ATR], then it is [-low]:

(24) [+ATR] → [-low]

Kaye et al. [1985] proposes this as a universal constraint at the phonetic level; that is, no phonetically low vowel can be [+ATR]. Even if that claim should prove to be incorrect, (24) appears to express a correct markedness relation between the two features. The third type of case where a [-low] specification can be redundant is contingent on selecting [round] over [back] for inclusion in underlying representations. If [round] (specifically [+round]) is underlyingly specified, then the [-low] specification on [o] and [ọ] is redundant:[14]

(25) [+round] → [-low]

Apart from the fact that (25) is a correct generalization about Okpẹ, it is supported by the fact that round vowels being non-low seems to be the unmarked property for vowel systems in general.

    With the adoption of the three rules in (23-25), the final set of underlying vowels in Okpẹ is as follows:[15]

(26) Minimal Vowel Specifications

	i	ị	e	ẹ	a	ọ	o	ụ	u
ROUND						+	+	+	+
HIGH	+	+						+	+
LOW				-					
ATR	+		+				+		+

---

[14]The feature value [-low] is doubly redundant in [o] because of both [+round] and [+ATR] specifications.

[15]It would be possible to obtain the same feature representations as in (26) by using a rule like [-round, -high, -ATR] → [+low] in conjunction with a context-free rule inserting [-low] (a suggestion made to me by Morris Halle) Following a suggestion by Diana Archangeli, I adopt the analysis given in the text because the rules proposed there all appear to constitute implications of an absolute or unmarked cross-linguistic character, unlike the rule for [+low] just mentioned.

Note that because [round] is used contrastively, [ǫ] does not require a [-low] specification because it is [+round] (whereas [ę] must be underlyingly marked [-low]). If the feature [back] were used underlyingly instead of [round], an additional specification would be needed for [ǫ] , namely [-low]. Such a feature would be necessary since a redundancy rule for [-low] involving [back] (but not [round], e.g. a rule like [+back] → [-low]) could not be formulated so as to apply to [ǫ] but not to [a] . Hence a final represent-ation for Okpę vowels is selected that utilizes the features [high], [low], [round], and [ATR], with the feature values given in (26).

4.3. <u>The [a]/[e] alternation</u>. In this section, I consider how the propos-als so far developed account for the problem of why the low vowel [a] takes [e] as its [+ATR] counterpart in prefixes. It is proposed that the occur-rence of [e] is an automatic consequence of the application of the redundan-cy rules in conjunction with the independently motivated rule of ATR Harmony (10). Consider the derivation of forms such as à dárí 'we (inclusive) drank' and è tírí 'we (inclusive) pulled'. Underlyingly, the two stems appear as follows:[16]
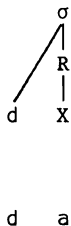
(27) a.   d   X   b.   t   X
                                             ＼
                                              +hi
                                   +A
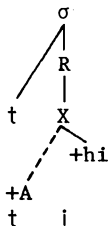   d   a   t   ị

The vowel [a] in (27a) has no specifications at all underlyingly while [i] is underlyingly assigned [+high] and belongs to a stem with a [+ATR] autoseg-ment. Syllabification followed by application of the Association Conventions results in the following (where "σ" indicates 'syllable' and "R" indicates 'Rime'):

---

[16]For simplicity of exposition, I omit tone in the following examples and represent consonants by consonantal symbols as à short-hand for the actual autosegmental representation involving skeletal slots linked to distinctive feature matrices.
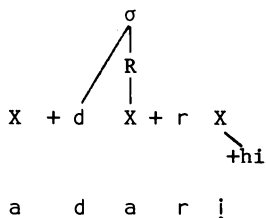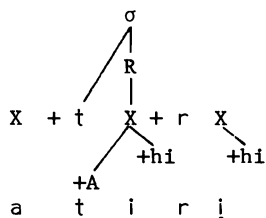
(28) a.

```
        σ                    b.          σ
       /|                               /|
      / R                              / R
     /  |                             /  |
    d   X                            t   X
                                        /\
                                    ,--'  +hi
                                 ,-'
                                +A
    d   a                        t   i
```

Affixation of the morphemes a 'we (inclusive)' and rị 'past tense' derives
the following:

(29) a.

```
        σ                    b.          σ
       /|                               /|
      / R                              / R
     /  |                             /  |
 X + d  X + r  X                  X + t  X + r  X
              \                        /  \      \
              +hi                     / +hi   +hi
                                    +A
    a   d   a   r   ị                a   t   i   r   ị
```
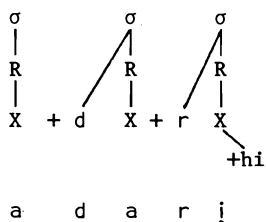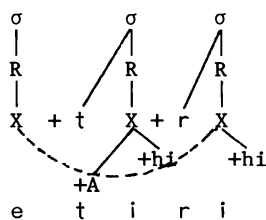
Syllabification then feeds the application of [ATR] Harmony (10):[17]

(30) a.

```
 σ      σ      σ            b.  σ      σ      σ
 |     /|     /|                |     /|     /|
 R    / R    / R               R    / R    / R
 |   /  |   /  |               |   /  |   /  |
 X + d  X + r  X               X + t  X + r  X
              \                 \`--._   /`--._   \
              +hi                 `--+hi`--  +hi
                                 +A
 a   d   a   r   ị                e   t   i   r   i
```

Consider now how the various redundancy rules apply to the two representations
in (30), where for convenience of reference, the relevant rules have been re-
produced below:

(31) a.   [+round] → [-low]

b.   [+high] → [-low]

---

[17]Note that the [+ATR] specification does not cross an association line in
the derivation of (30b) because [ATR] and [high] are on different planes [Arch-
angeli 1985].

    c. [+ATR] → [-low]
    d. [ ] → [+low]
    e. [ ] → [-round]
    f. [ ] → [-high]
    g. [ ] → [-ATR]

The three rules in (31a-c) must apply lexically for the following reason:
[-low] specifications occur in underlying representations (see (26) above); by
the Redundancy Rule Ordering Constraint (section 3.3 above), this means that
any redundancy rule assigning [-low] must be assigned to the first lexical
stratum. As regards the other redundancy rules (31d-g), however, no phonolog-
ical rules have been posited that refer to the values that they insert. Hence
the Redundancy Rule Ordering Constraint is not relevant, and (31d-g) begin
their application as late as possible, i.e. post-lexically or phonetically, by
virtue of the Default Ordering Principles (section 3.2 above).

    Consider therefore the application of the redundancy rules to the forms
given in (30) above, where for expository purposes, syllable structure has
been suppressed. Lexically, of the rules in (31a-c), (31b) and (31c) are ap-
plicable, applying as follows:

(32) a.   b.   +A
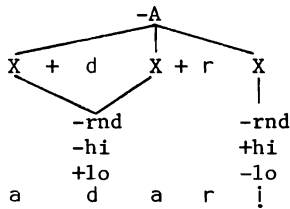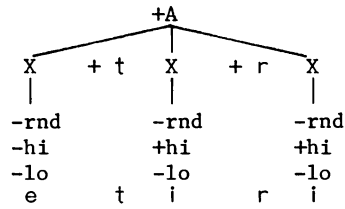 |
       X + d   X + r   X   X   + t X + r   X
               | | | | |
              +hi   +hi   -lo   +hi   +hi
              -lo   -lo   -lo   -lo
       a   d   a   r   i   e   t   i   r   i

Post-lexically, all rules in (31) become applicable, filling out the above
forms as follows:[18]

---

[18]As before, I assume that a single autosegment is inserted wherever pos-
sible (as in (33a)) because of the Obligatory Contour Principle, although noth-
ing hinges here on that assumption. Two identical autosegments occur in (33b)
because they are heteromorphemic. See McCarthy [1986].

(33) a.
```
                    -A                        b.              +A
             ┌──────┼──────┐                           ┌──────┼──────┐
          X + d   X + r   X                          X   + t   X   + r   X
              └───┐   │    │                          │        │        │
              -rnd    -rnd  │                       -rnd     -rnd     -rnd
              -hi     +hi  │                        -hi      +hi      +hi
              +lo     -lo  │                        -lo      -lo      -lo
          a     d   a   r   ị                      e     t    i     r    i
```

The crucial aspect of these derivations concerns the applicability of the redundancy rules for [low]. The prefix of (33a), underlyingly low, does not meet the structural description of any of rules (31a-c) and is therefore assigned [+low] by the context-free rule (31d). The same underlying prefix in (33b), however, satisfies the structural description of (31c) because of its [+ATR] specification, the result of ATR Harmony. As a consequence, the prefix in (33b) receives a [-low] specification, thereby blocking the general redundancy rule (31d) and causing its vowel to surface as [e].

To conclude this section, it has been argued that the change from [a] to [e] in [+ATR] contexts is the direct result of the interaction of the redundancy rules of Okpẹ with the rule of [ATR] Harmony. Application of the redundancy rules for [low] to a representation including the value [+ATR] results in the assignment of [-low], deriving [e]; application of the same rules to a representation including the value [-ATR] results in the assignment of [+low], deriving [a]. No special rule is required to account for the "change" from [a] to [e]; the apparent change simply falls out from the applicability or lack of applicability of particular redundancy rules.

4.4. <u>The [a]/[ẹ] alternation</u>. I propose to treat the alternation between [a] and [ẹ] in a manner basically analogous to that described above for [a]/[e], where the appearance of a low vowel vs. a mid vowel depends on the redundant assignment of particular feature values. I argue that such a position is correct, in spite of an immediate problem: the reason that the phonologically low vowel surfaces as non-low in the cases discussed in the last section is specifically because such vowels are in [+ATR] contexts. The assignment of [+ATR] by [ATR] Harmony feeds the redundancy rule that assigns [-low]. The problem for the [a]/[ẹ] alternation is apparent. To become

non-low, the vowel must be in a [+ATR] context; but the vowel which surfaces
is [-ATR]. This paradox is resolved by an analysis which posits a derivation
where V-initial low vowel suffixes of the type under discussion first undergo
[ATR] Harmony (deriving the [+ATR] context needed to trigger the assignment of
[-low]) and then undergo a rule of resyllabification, which has the result of
removing the [+ATR] specification of the suffix. In the discussion that fol-
lows, I begin by looking at the process of resyllabification and then go on to
demonstrate its interaction with the rules of harmony and redundancy already
laid out above.

4.4.1. <u>Resyllabification</u>. The basic facts to be accounted for in this sec-
tion concern configurations that result from the juxtaposition of vowels. Rel-
evant data has already been seen in cases like (2) and (3) above, which I re-
peat below in a reorganized form:

(34) a. /e/ sé   'fall!'   èsé   'to fall'

     b. /o/ só   'steal!'   èsó   'to steal'

     c. /ẹ/ dẹ́   'buy!'   ẹ̀dẹ́   'to buy'

     d. /ọ/ lọ́   'grind!'   ẹ̀lọ́   'to grind'

(35) a. /i/ tí   'pull!'   ètyó   'to pull'

     b. /u/ rú   'do!'   èrwó   'to do, make'

     c. /ị/ rị́   'eat!'   ẹ̀ryọ́   'to eat'

     d. /ụ/ sụ́   'sing!'   ẹ̀swọ́   'to sing'

In these examples, the vowel of the infinitive suffix is deleted if it im-
mediately follows a non-high vowel (34); but if the suffix vowel immediately
follows a high vowel, then the high vowel becomes a glide and the suffix vowel
survives. While it is clearly possible to produce such facts by positing two
rules (one of deletion and one of glide formation), such an approach misses
certain generalizations. First, the essential point seems to be that se-
quences of adjacent vowels are not desirable in Okpẹ. Such se-
quences are rearranged, but in a manner that depends on the segmental charac-
terization of the vowels concerned. One point to be captured is that the un-
desirability of the sequence is independent of its segmental composition, and
this point is completely missed in an approach that simply posits two indepen-

dent rules. Second, it appears to be the case that the rules always apply to-
gether, i.e. one rule does not apply in certain environments to the exclusion
of the other.

The relation between vowel deletion and glide formation can be straightfor-
wardly captured in an account where *unsyllabified* skeletal positions are not
pronounced. To determine the type of conditions that result in unsyllabified
slots, let us first consider the types of slots that get syllabified. In Okpẹ,
this is a fairly simple matter. All syllables are open; onsets consist of an
optional consonant followed by an optional glide or [r] . Basic syllabifica-
tion can be expressed by the following rule, where Ⓧ indicates an unsyllabi-
fied slot:[19]

(36) Syllabification:

$$X_0 \quad Ⓧ \quad \rightarrow \quad X_0 \quad X$$
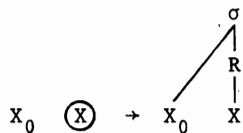
An unsyllabified slot is assigned a rime node, with preceding slots incorporat-
ed as an onset. I assume that independent constraints determine precisely
which segment types can occupy particular syllabic positions. That is, I as-
sume constraints such as the following:

(37) a.   Only slots specified for at least one of the vowel features [round],
          [high], and [low] are eligible to be made into a rime.

     b.   Consonant clusters are possible only if the second segment in the
          cluster is [+high] or [r] .[20]

As illustration, consider the derivation of ẹdẹ́ 'to buy' and ẹswọ́ 'to sing'

---

[19]The precise details of the theory of syllabic structure are not crucial
for the points being made about Okpẹ. Here and throughout, I follow Kaye and
Lowenstamm [1984], Levin [1983], Archangeli [1984], etc. in assuming that the
syllabic content of the skeletal ("CV") tier is derivative. See Archangeli
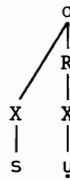for some discussion of the formalism I adopt here.

[20]Some examples of clusters involving [r] are: ìmrí 'fat', èvró 'to
lose (something)', ẹhrá 'to split up', òsòlóbrùghwẹ́ 'God'. I will not go in-
to the feature specification of [r] (or other consonants) here, and therefore
leave a more general statement of the restriction on clusters open.

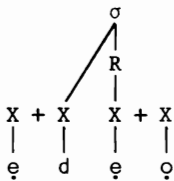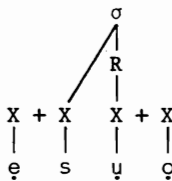At the level of the stem, syllabification produces the following:

(38) a.
```
           σ
          /|
         / R
        /  |
       X   X
       |   |
       d   ẹ
```

b.
```
           σ
          /|
         / R
        /  |
       X   X
       |   |
       s   u̞
```

If the forms being derived were imperative, such syllabifications would be com-
plete: dẹ́ 'buy!', sú̞ 'sing!'. But for the infinitive forms, further affix-
ation would derive the following:

(39) a.
```
             σ
            /|
           / R
          /  |
     X + X  X + X
     | |    | |
     ẹ d    ẹ ọ
```

b.
```
             σ
            /|
           / R
          /  |
     X + X  X + X
     | |    | |
     ẹ s    u̞ ọ
```
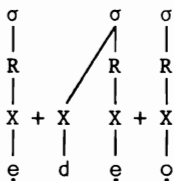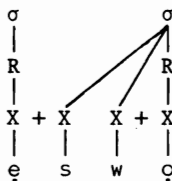
In (39a), when a rime is built on the suffix vowel, preceding material cannot
be incorporated into the existing syllable since [ẹ] is not a possible onset;
in (39b), on the other hand, the suffix vowel can form a single syllable with
the two preceding segments since onsets can include a consonant plus glide se-
quence:

(40) a.
```
   σ      σ   σ
   |     /|   |
   R    / R   R
   |   /  |   |
 X + X  X + X X + X
 | |    | |   | |
 ẹ d    ẹ     ọ
```

b.
```
   σ          σ
   |         /|
   R      __/ R
   |    _/  | |
 X + X X + X X + X
 | |   | |   | |
 ẹ s   w     ọ
```

The representation in (40b) now gives the correct surface form ẹ̀swọ́ . But as
it stands, the structure in (40a) predicts the incorrect form *ẹ̀dẹ́ọ́ . The
problem with such a structure involves the vowel sequence ẹọ , ruled out since
sequences of vowels are only possible in Okpe under quite restricted circum-
stances. Basically, a sequence of V-slots is possible only if linked to the
same vowel matrix or if the first vowel is high; in both types of cases, there

is a tonal requirement that the two vowels be on different tones:

(41) a. mìá ꜜdá   'I am drinking'

 b. àrìé ꜜrwẹ́   'you are doing'

 c. ìsáàgwẹ̀   'groundnuts'

 d. ìgyíìnì   'locally made gin'

Notice that whatever the precise factors are that allow a vowel sequence to
persist, they do not exist in a case like (40a). As a consequence, a rule de-
syllabifies the second of the two vowels in contact, deriving the following:

(42) a. σ   σ
 │   ╱│
 R   ╱ R
 │   ╱ │
 X + X   X + X
 │   │   │   │
 ẹ   d   ẹ   ọ
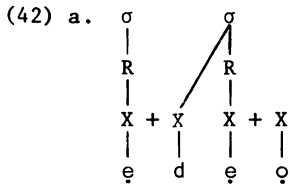
Because the unsyllabified vowel cannot be syllabified into an existing sylla-
ble and because it cannot be syllabified by itself, it remains unsyllabified
and does not surface phonetically.[21]

　　Consider now cases involving the underlyingly unspecified vowel, [a] ,
such as ẹ̀dá 'to drink' and á ꜜswá 'we (inclusive) are singing'. Prior to
syllabification, such cases would appear as follows:

(43) a. X + X   X + X   b. X + X   X + X
 │   │   │   │   │
 ẹ   d   ọ   s   u̯
 ẹ   d   a   ọ   a   s   u̯   a

These cases pose a problem for syllabification—precisely because of the un-
specified segments. It was proposed in (37) that a rime can be built on a
skeletal slot in Okpẹ only if that slot dominates a specification of [high],
[round], or [low], correctly allowing the syllabification of all cases except

---

[21]No problem would result if some rule were assumed to actually delete
such an unsyllabified segment. The cases involving [a] (discussed below)
demonstrate that such deletion could not replace the stage of desyllabifica-
tion, however.

[a] .[22] In order to also allow the syllabification of [a] , there are two basic alternatives: (1) low vowels could be underlyingly syllabified; (2) the requirement just mentioned could be relaxed to the following:

(44)   A slot is eligible for rime status provided that is it NOT specified for any feature other than [high], [round], or [low].

This revised requirement would allow the syllabification of [a] in cases like those in (43) because the vowels in question have no consonantal specifications.

Although either assumption would allow the correct syllabification of examples such as those in (43), I choose the first formulation (37) for two reasons. First, relaxing the condition on the configurations that allow rime construction has an undesirable effect, to be discussed directly. Second, assuming that low vowels are underlyingly syllabified (precisely because of their underspecified status) accounts automatically for their harmonic behaviour.[23]

Consider first the problem with relaxing the condition on rimes. As mentioned above, branching onsets are possible in Okpẹ only if the second member of the onset is [+high] or [r] , as in an example like (40b) above. If conditions on syllable structure are to be formulated along the lines of the revised rime condition just given, then the onset condition (37) should presumably be formulated as follows (where (45) does not take into consideration the onsets with [r] as second member):

(45)   Consonant clusters are possible if the second segment in the cluster is NOT specified for any feature value other than [+high].
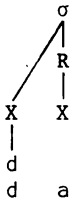
Unlike the revised requirement for rimes in (44), (45) provides incorrect results when involving [a] . Consider the syllabification for forms such as

---

[22]Actually, [e] would also require underlying representation of syllable structure (as pointed out to me by Diana Archangeli), since [+ATR] (the only marker of [e]) only associates to rimes. This is entirely consistent with the distinction between [a] and [e] being simply the presence vs. absence of a [+ATR] specification, as argued here.
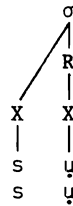
[23]For discussion of a comparable problem (and a comparable solution) involving completely unspecified segments in Japanese, see Grignon [1984].

ẹ̀dá and á !swá given in (43), where the revised conditions on syllabifica-
tion (44) and (45) are assumed. On the stem cycle, syllabification would ap-
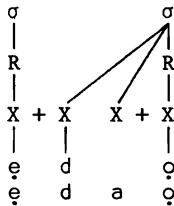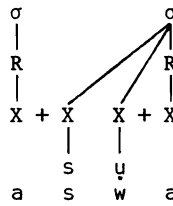ply in both cases:

(46) a.

```
            σ
           /|
          / R
         /  |
        X   X
        |
        d
        d    a
```

b.

```
            σ
           /|
          / R
         /  |
        X   X
        |   |
        s   ṳ
        s   ṳ
```

After affixation, and assuming the revised condition on clusters given in (45),
syllabification would apply as follows:

(47) a.

```
   σ              σ
   |             /|
   R           // R
   |          //  |
   X + X    X + X
   |   |        |
   ẹ   d        ọ
   ẹ   d    a   ọ
```

b.

```
   σ              σ
   |             /|
   R           // R
   |          //  |
   X + X    X + X
       |    |
       s    ṳ
   a   s    w    a
```

While application of the redundancy rules would correctly derive á !swá in
the second case, an incorrect surface form would be derived in the first case.
Although there is some question as to how the configuration in (47a) would act-
tually surface, it is clear that it would not be ẹ̀dá without some ad hoc rule
of adjustment. The problem in this case is a direct result of reformulating
the condition on consonant clusters as in (45). With the version of the condi-
tion given in (37), and if low vowels are underlyingly syllabified, then resyl-
labification of ẹ̀dá would have proceeded in a manner entirely analogous to
ẹ̀dẹ́ (40), producing correct results.

In conclusion, I adopt the requirements for syllabification in (37). The
condition in (37b) must be as formulated so as not to produce incorrect results
such as those just considered, and the condition in (37a) is adopted in the in-
terests of uniformity. That is, given the analysis here, conditions on sylla-
ble structure involving underspecification refer only to specified values, not
to their absence.

4.4.2. <u>Automatic Dissociation</u>. The examples seen in the preceding section
all involve [-ATR] stems and are therefore relatively uninteresting as far as
the application of the redundancy rules are concerned. In all cases, redun-
dant values simply assign the feature values expected, given the underlying
representation of the vowels in question. The assignment of redundant values
becomes more interesting, however, when we consider cases where stems are
[+ATR]. It is proposed here that the [-low], [-ATR] specification of an under-
lyingly low vowel in a case like é !rwẹ́ 'we (inclusive) are doing' results
from the following sequence of rule applications: (1) [ATR] Harmony takes
place, (2) the rule assigning [-low] to a [+ATR] vowel applies, (3) resyllabi-
fication takes place, triggering (4) a loss of [ATR]-bearing status.

      To illustrate this chain of events, I will contrast the derivation of
ètyó 'to pull' (where a *non-low* suffix surfaces as [+ATR] as expected in a
[+ATR] context) with é !rwẹ́ 'we (inclusive) are doing' (where a V-initial
low suffix surfaces as [-ATR] in a [+ATR] context). At the level of the stem,
two things happen: (i) syllabification takes place in a straightforward fash-
ion in both cases, and (ii) the [+ATR] autosegment links to the newly created
rimes. (Recall that it is rimes that constitute ATR-bearing units.)
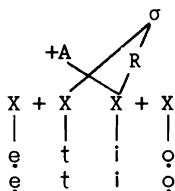
(48) a.
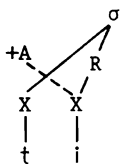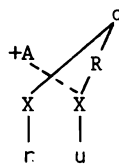
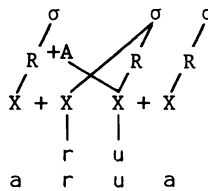

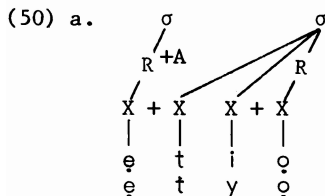Affixation then creates the following configurations:
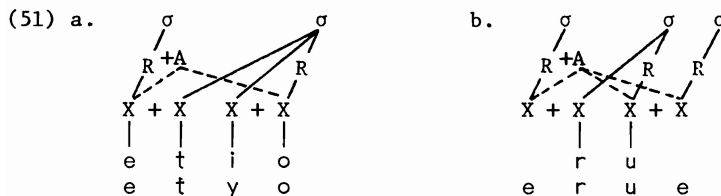
(49) a.

The crucial difference between the two cases involves the presence of underly-
ing syllabification in (49b) because of the low-vowel affixes and the absence

of underlying syllabification in the affixes of (49a). Since (49b) is com-
pletely syllabified, the syllabification rule in (36) is inapplicable; with
(49a), on the other hand, syllabification derives the following:

(50) a.

```
        σ                σ
       /                /|
      R +A              / R
     /   \            /  |
    X + X   X + X   X + X
    |   |   |   |
    ẹ   t   i   ọ
    ẹ   t   y   ọ
```

ATR Harmony applies in both cases to derive:

(51) a.

```
        σ                σ
       /                /
      R +A              R
     /  \ \            /
    X + X   X + X
    |   |   |   |
    e   t   i   o
    e   t   y   o
```

b.

```
      σ      σ   σ
     /      /   /
    R +A   R   R
   /  \   /   /
  X + X   X + X
      |   |
      r   u
  e   r   u   e
```

Recall from sections 3.2 and 3.4 that redundancy rules begin their application
as early as possible on the stratum to which they are assigned, and they apply
whenever they can from the point at which they begin to apply. This means
that one of the times that the rule assigning [-low] to [+ATR] vowels (31c) is
applicable (as well as the other rules assigning [-low]) is immediately after
the rule of ATR Harmony. In cases like (51), this means the following (where
for reasons of exposition only vowel specifications are indicated):

(52) a.

```
        σ                σ
       /                /
      R  +A             R
     /  \              /
    X + X   X + X
    |       |   |
   -lo     +hi +rnd
           -lo -lo

    e   t   y   o
```

b.

```
      σ      σ    σ
     /      /    /
    R  +A  R    R
   /  \   /    /
  X + X   X + X
  |       |   |
 -lo     +hi -lo
         +rnd
         -lo

  e   r   u    e
```
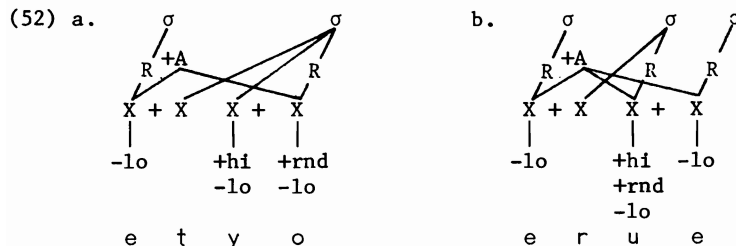
Since all the vowels in (52) are [+ATR] as a result of [ATR] Harmony, all vow-
els receive [-low] by the redundancy rule (31c) (Of course, they may also re-
ceive [-low] by virtue of being [+round] or [+high]).

But there is a problem with the syllabification of (52b). Just as in
(40a) above, (52b) contains an unacceptable sequence of adjacent vowels. As a
result, the second rime must be deleted (just as in (40a)):

(53)

$$
\begin{array}{ccccc}
& \sigma & & \sigma & \\
& \diagup & & \diagup & \\
R & +A & & R & \\
\diagup & \diagdown & & & \\
X\ +\ X & & X\ +\ X & & \\
| & & | & & | \\
-lo & & +hi & & -lo \\
& & +rnd & & \\
& & -lo & & \\
e & r & u & & e \\
\end{array}
$$
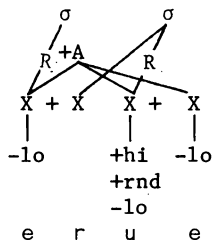
Loss of the second rime in (53), however, produces a situation where an [ATR]
autosegment is associated to a skeletal position that is NOT a rime, that is,
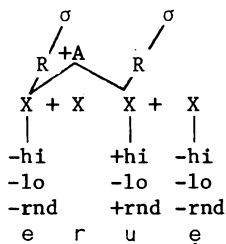the final segment above. I assume, following Haraguchi [1977:290], that an
autosegment is automatically delinked if the slot it is linked to ceases to be
P-bearing.[24] Since the final segment in (53) is no longer ATR-bearing, this
means that the [+ATR] autosegment delinks:

(54)

$$
\begin{array}{cccc}
& \sigma & & \sigma \\
& \diagup & & \diagup \\
R & +A & R & \\
\diagup & \diagdown & \diagdown & \\
X\ +\ X & & X\ +\ X & \\
| & & | & | \\
-hi & & +hi & -hi \\
-lo & & -lo & -lo \\
-rnd & & +rnd & -rnd \\
e & r & u & ẹ \\
\end{array}
$$

The parallel that has been drawn between a case such as that in (54) and a
case such as ẹ̀dé (40a) now breaks down in one important sense. After loss
of rime status, the suffix -ọ in ẹ̀dé cannot be resyllabified and therefore
is not pronounced; in the case of é ꜝrwẹ́ , however, loss of rime status in
(54) feeds the reapplication of the regular syllabification rules producing

---

[24]Haraguchi actually formulates the constraint with respect to tone, hence
the interpretation here is slightly generalized.

the well-formed configuration below:[25]

(55)

```
          σ                        σ
        /                        /|
     R +A                       / |  R
      /|         /    /        /  |  /
   X + X      X  +  X         /   | /
   |          |      |
  -lo        +hi    -lo
             +rnd
             -lo

   e    r    w      ẹ
```

At this point in the derivation, one additional assumption guarantees the cor-
rect surface result, namely the assumption that spreading of autosegments is
NOT automatic [Pulleyblank 1983]. If automatic spreading were assumed, as in
Goldsmith [1976], then the [+ATR] autosegment present in (55) would be re-as-
signed to the final vowel after resyllabification, producing the incorrect sur-
face form *éʹrwé . If spreading is rule-governed rather than automatic, then
it is inapplicable in (55) provided that ATR Harmony is ordered before resyl-
labification.[26] And if spreading does not take place, then the value [-ATR]
is redundantly assigned to the final vowel in (55) producing the correct sur-
face form éʹrwẹ́ .

To summarize, this analysis makes crucial use of the following assumptions:
(i) low vowels in Okpẹ are underlyingly unspecified, therefore requiring under-
lying syllabification to identify them as vowels; (ii) redundancy rules apply
according to the general principles outlined in section 3; (iii) [ATR] auto-
segments are automatically dissociated from any skeletal position that ceases

---

[25]Note that in both (55) and (50), glide formation would (by Automatic
Dissociation) cause the [+ATR] autosegment to delink. In (50), such delink-
ing would be followed by reassociation by the automatic application of the As-
sociation Conventions (one-to-one linking), followed by [ATR] Harmony (since
delinking in (50) is caused by initial syllabification). In (55), delinking
would trigger no further rules since the [+ATR] autosegment would not be float-
ing, and since [ATR] Harmony would already have applied (delinking being trig-
gered by resyllabification).

[26]See Steriade [1982] for cases where rules adjusting syllabification are
non-initial.

to be [ATR]-bearing; (iv) spreading of autosegments is not automatic. Given these assumptions, the surface manifestation of an underlyingly low vowel as [ẹ] in an appropriate [+ATR] context is derived without the postulation of any special rules.

5. <u>Conclusion</u>

This paper has argued that the changes observed when low vowels appear in [+ATR] harmonic contexts can be accounted for without positing special, ad hoc feature-changing rules. Cases where a low vowel surfaces as [e] have been shown to result automatically from the interaction of the redundancy rules with a general rule of [ATR] Harmony; cases where a low vowel surfaces as [ẹ] result from a comparable interaction of harmony and underspecification, in conjunction with an independently motivated rule of desyllabification.

It is to be expected that the various principles of a modular grammar (cf. Chomsky [1981]) will interact to produce a rich variety of surface representation. This has been argued to be the case for low vowel alternations in Okpẹ.

REFERENCES

Archangeli, Diana. 1984. "Underspecification in Yawelmani phonology and morphology." Ph.D dissertation, MIT.

Archangeli, Diana. 1985. "Yokuts harmony: evidence for coplanar representation in nonlinear phonology." *Linguistic Inquiry* 16:335-372.

Archangeli, Diana and Douglas Pulleyblank. in preparation. "The content and structure of phonological representations." ms., University of Arizona and University of Southern California.

Awobuluyi, A.O. 1967. "Vowel harmony and consonant harmony in Yoruba." *Journal of African Languages* 6(1):1-8.

Bamgboṣe, Ayo. 1967. "Vowel harmony in Yoruba." *Journal of African Languages* 6(3):268-273.

Chomsky, Noam. 1981. *Lectures on Government and Binding: The Pisa Lectures*. Dordrecht: Foris Publications.

Chomsky, Noam and Morris Halle. 1968. *The Sound Pattern of English*. New York: Harper & Row.

Clements, G.N. 1981. "Akan vowel harmony: a nonlinear analysis." In George N. Clements (ed.), *Harvard Studies in Phonology*, Vol. II, pp. 108-177. Bloomington: Indiana University Linguistics Club.

Clements, G.N. and E. Sezer. 1982. "Vowel and consonant disharmony in Turkish." In H. van der Hulst and N. Smith (eds.), *The Structure of Phonological Representations, Part II*, pp. 213-255. Dordrecht: Foris Publications.

Grignon, Anne-Marie. 1984. "Phonologie lexicale tri-dimensionelle du japonais." Ph.D dissertation, University of Montreal.

Halle, Morris and K.P. Mohanan. 1985. "The segmental phonology of Modern English." *Linguistic Inquiry*, 16:57-116.

Haraguchi, Shosuke. 1977. *The Tone Pattern of Japanese: An Autosegmental Theory of Tonology*. Tokyo: Kaitakusha.

Hoffmann, Carl. 1973. "The vowel harmony system of the Okpẹ monosyllabic verb." *Research Notes from the Department of Linguistics and Nigerian Languages* 6:79-111. University of Ibadan.

Kaye, Jonathan and Jean Lowenstamm. 1984. "De la syllabicité." In F. Dell, D. Hirst and J.-R. Vergnaud (eds.), *Forme sonore du langage*, pp. 123-159. Paris: Hermann.

Kaye, Jonathan, Jean Lowenstamm and Jean-Roger Vergnaud. 1985. "The internal structure of phonological elements: a theory of charm and government." *Phonology Yearbook* 2:305-328.

Kiparsky, Paul. 1982. "Lexical morphology and phonology." In The Linguistic

Society of Korea (ed.), *Linguistics in the Morning Calm*, pp. 3-91. Seoul: Hanshin Publishing Company.

Leben, William R. 1973. "Suprasegmental Phonology." Ph.D dissertation, MIT.

Levergood, Barbara. 1984. "Rule governed vowel harmony and the strict cycle." *Proceedings of NELS 14*, pp. 275-293. Amherst, MA: GLSA, UMASS, Amherst.

Levin, Juliette. 1983. "Reduplication and prosodic structure." ms., MIT.

Lightner, T.M. 1963. "A note on the formulation of phonological rules." *Quarterly Progress Report of the Research Laboratory of Electronics MIT*, 68:187-189.

Lindau, Mona. 1979. "The feature expanded." *Journal of Phonetics* 7:163-176.

Mascaro, J. 1976. "Catalan phonology and the phonological cycle." Bloomington: Indiana University Linguistics Club.

McCarthy, John J. 1986. "OCP effects: gemination and antigemination." *Linguistic Inquiry* 17:207-263.

Mohanan, K.P. 1982. "Lexical Phonology." Ph.D dissertation, MIT.

Omamor, Augusta Phil. 1973. "Uvwie—a case of vowels merging." *Research Notes from the Department of Linguistics and Nigerian Languages* 6:113-143. University of Ibadan.

Pulleyblank, Douglas. 1982. "Tiv and the association conventions." In *Proceedings of ALNE 13/NELS 13*, pp. 211-228. Amherst: GLSA.

Pulleyblank, Douglas. 1983. "Tone in Lexical Phonology." Ph.D dissertation, MIT. [In press: Dordrecht: Reidel].

Pulleyblank, Douglas. 1986. "Tone and the morphemic tier hypothesis." Paper presented at the University of Milwaukee Morphology Symposium.

Pulleyblank, Douglas. in press. "Rule application on a non-cyclic stratum." *Linguistic Inquiry*.

Stanley, R. 1967. "Redundancy rules in phonology." *Language*, 41:294-302.

Steriade, Donca. 1982. "Greek prosodies and the nature of syllabification." Ph.D dissertation, MIT.

Steriade, Donca. 1984. "Glides and vowels in Romanian." ms., University of California, Berkeley.

/-a-/ REDUCTION PHENOMENA IN LUYIA

Gerard M. Dalgish
Baruch College, CUNY

A discussion of the complex segmental morphophonemics
of the distant past tense marker /-a-/ in OluTsootso.
Its interaction with other rules and conditions in the
language is placed in the perspective of unifying dis-
parate data, demonstrating the power of the paradigm,
and avoiding homophony.

1. Introduction

This paper is a discussion of the alternations involving the morpheme
/-a-/ , a distant past tense marker in the OluTsootso dialect of Luyia, a Ban-
tu language of Kenya.[1] This morpheme appears before the verbal root in cer-
tain past tense constructions, and also as the so-called "associative -a- "
in relative clause and possessive constructions. The more complex and there-
fore interesting alternations surround its use in the verbal paradigm, so only
occasional mention of the relative and possessive constructions will be made.

While there has been much discussion of segmental alternations in Bantu
languages of root-final segments when followed by the past tense suffix -ile
(see Kisseberth [1976] and Dalgish [1977] among many others), there has not
been much attention to segmental alternations involving root-initial non-nasal
elements and the prefixes causing such alternations. As this paper will show,
the alternations on that side of the root are every bit as complex and inter-
esting as root-final changes, especially when taken in the context of the en-
tire phonology of the language.

This paper will therefore attempt to provide a unified account of the data involving /-a-/ , unified in the sense that all the alternations involving /-a-/ will be treated together, while maintaining the integrity of the other rules and meta-conditions found to function in the rest of the phonology. In addition, the role of the paradigm, in a sense to be discussed later, turns out to be of crucial importance in understanding the motivation for the com-plixities of the /-a-/ rules. Finally, there will be an appeal to the prin-ciple of avoidance of homophony to account for the language's insistence on exceptions to some of the /-a-/ rules.

2. Background Rules

To appreciate the /-a-/ reduction rules, a brief look at contexts *not* involving this morpheme must precede. The alternations and rules for these da-ta are motivated more fully in Dalgish [1976]; a few examples and a brief dis-cussion and formulation should suffice for our purposes.

In certain contexts, a sequence of two underlying vowels surfaces un-changed:

(1) /li-ar-nga/   →   liaraanga[2]
     cl.5 SM-split-T(ense)   'it splits'

     /βa-asamul-nga/   →   βaasamulaanga
     Cl.2 SM-sneeze-T   'they sneeze'

     /oxu-um-a/   →   oxuuma
     Cl.15-dry-T   'to dry'

Glide Formation and Compensatory Lengthening occurs regularly for se-quences of /u-V/ (but not for /i-V/ as (1) shows), except when V is it-self /u/ :

(2) /oxu-iβ-a/   →   oxwiiβa
     Cl.15-steal-T   'to steal'

     /βu-akam-nga/   →   βwaakamaanga
     cl.14 SM-come to an end-T   'it comes to an end'

_____

[2]A vowel copy rule applies to insert a in these forms of the present tense. See Dalgish [1976].

/lu-eleel-nga/   →   lweeleelaanga
c1.11 SM-dangle-T   'it dangles'

/xu-um-nga/   →   xuumaanga
1pl. SM-dry-T   'we dry'

Vowel Coalescence occurs when underlying sequences of /a-V/ surface (note that we are not discussing the past tense /-a-/ here yet). If V is non-low, it becomes mid, and the preceding /-a-/ becomes mid as well. Contrast the second example in (1) with the examples below:

(3) /βa-iβ-nga/   →   βeeβaanga
     c1.2 SM-steal-T   'they steal'

     /ka-eleel-nga/   →   keeleelaanga
     c1.6 SM-dangle-T   'they dangle'

     /βa-um-nga/   →   βoomaanga
     c1.2 SM-dry-T   'they dry'

     /βa-or-nga/   →   βooraanga
     c1.2 SM-bask-T   'they bask'

A y is inserted to break up sequences of three vowels, as the following data with the reflexive (R) morpheme /-i-/ show.

(4) /li-i-el-nga/   →   liiyelaanga
     c1.5 SM-R-select-T   'it selects itself'

     /xu-i-ir-nga/   →   xwiiyiraanga
     1pl. SM-R-kill-T   'we kill ourselves'

     /βa-i-ononi-nga/   →   βeeyononiinjia[3]
     c1.2 SM-R-spoil-T   'they spoil themselves'

The examples below show that a rule inserting y- in initial position must be posited. This has been discussed elsewhere in Dalgish [1976] as part of a general condition to prevent sequences of word-initial VV from appearing. This will have significance in later discussion, but for now please note that both y-insertion rules may sometimes apply:

_____

[3]A vowel copy rule related to the one mentioned in footnote 2 applies to these forms as well. See Dalgish [1976].

(5) /a-ar-nga/   →   yaaraanga
     Cl.1 SM-split-T   's/he splits'

     /a-um-nga/   →   yoomaanga
     cl.1 SM-dry-T   's/he dries'

     /a-i-ar-nga/   →   yeeyaraanga
     cl.1 SM-R-split-T   's/he splits her/him-self'

Before a nasal cluster, vowels are lengthened. Note that once a vowel is
lengthened word-initially, y-Insertion must apply:

(6) /βa-N-βaamb-nga/   →   βaambaambaanga
     cl.2 SM-1sg OM-sacrifice-T   'they sacrifice me'

     /a-N-ram-nga/   →   yaandamaanga
     cl.1 SM-1sg OM-defeat-T   's/he defeats me'

The following points emerge from this brief overview of the regular alter-
nations of vowel sequences. Generally, when a vowel is deleted (as in Glide
Formation) or its color changed (as in Coalescence), the number of underlying
vowel morae is superficially preserved (by Compensatory Lengthening in Glide
Formation and by allowing two morae to surface in Coalescence). When y is
inserted, there is no change in vowel morae quantity. Up to now, only in Pre-
nasal Cluster Lengthening (PNCL) does the number of vowel morae change from
underlying to surface forms.

3. <u>Alternations with /-a-/</u> .

We are now in a position to examine actual alternations with the morpheme
/-a-/ as past tense marker.

3.1. <u>/-a-/ + Consonant</u>. We will begin the discussion with forms in which
root-initial consonant is preceded by /-a-/ . Note the following alterna-
tions:

(7) /li-a-fiimb-a/   →   lyafiimba
     cl.5 SM-a-cover-T/A   'it covered'

     /βa-a-fiimb-a/   →   βafiimba
     cl.2 SM-a-cover-T/A   'they covered'

     /xu-a-lum-a/   →   xwaluma
     1pl SM-a-bite-T/A   'we bit'

```
/a-a-las-a/                    →    yalasa
cl.1 SM-a-sting-T/A                 'he stung'
```

The first example in this set illustrates a pattern for all i-final pre-
fixes. Instead of the normal nondevocalization of i before a vowel (compare
(1)), a special devocalization of this vowel takes place before the /-a-/
past tense marker when a consonant follows /-a-/. In addition, Vowel Reduc-
tion must take place, as the second example βafiimba shows (compare (1)
again). Third, note that although devocalization of u takes place, there is
no apparent compensatory lengthening of the following /-a-/ (compare (2)).
Finally, the last example shows that y is inserted initially even though two
vowels do not surface, as long as the second underlying vowel is the past
tense /-a-/ (compare (5) and (6)).

These data indicate that we need special rules for the vowel sequences
arising with /-a-/ : special devocalization of i and a more general reduc-
tion of vowel sequences arising from V+ /-a-/. Since in so many other con-
texts certain generalizations concerning vowel sequences seem to hold up, it
seems more desirable to maintain as much as we can of the substance of these
generalizations in the formulation of any of the special rules needed by this
/-a-/ data. Thus, the special devocalization of i before /-a-/ will be
assumed to have Compensatory Lengthening accompanying it, since u is compen-
satorily lengthened whenever it is devocalized.[4] Since the examples with a-
final prefixes necessitate an /-a-/ Reduction rule, it will be assumed that
the same rule applies to any vowel sequences arising from V- + /-a-/ . The
rules are stated below and listed in the order guaranteeing correct output:

(8)

Underlying	/li-a-fiimba/	/βa-a-fiimba/	/xu-a-luma/	/a-a-lasa/
Glide Form. & Comp. Length.	ly-aa-fiimba	---	xw-aa-luma	---
Ø → y /# VV	---	---	---	y-a-a-lasa
/-a-/ Reduct.	ly-a-fiimba	βa-fiimba	xw-a-luma	ya-lasa
Surface	[lyafiimba]	[βafiimba]	[xwaluma]	[yalasa]

---

[4]Dalgish [1976] provides extensive documentation of the extent to which
devocalization is accompanied by compensatory lengthening.

Note that it is impossible to determine from these data which of the two under-
lying vowels have been deleted in sequences of V + /-a/ . As the data become
more complex, so does this question..

3.2. /-a-/ + Vowel. We now turn to cases where /-a-/ is followed by a vow-
el-initial morpheme, which in OluTsootso comprise two sets: /-a-/ followed
by a vowel-initial root or /-a-/ followed by the reflexive marker, /-i-/ .

    We begin this section in turn with the simplest cases, in which a-final
prefixes precede /-a-/ , followed by vowel-initial roots or the reflexive
marker /-i-/ .

(9) /βa-a-ar-a   ·   →   βaara
        cl.2 SM-a-split-T/A   'they split'

     /ka-a-or-a/   →   koora
        cl.6 SM-a-bask-T/A   'they basked'

     /βa-a-i-lum-a/   →   βeeluma
        cl.2 SM-a-refl-bite-T/A   'they bit themselves'

    If we consider first /βa-a-ar-a/ → βaara 'they split', we note that
/-a-/ Reduction has taken place, but it is impossible to determine which vowel
has in fact been deleted. The last form, /βa-a-i-lum-a/ → βeeluma 'they
bit themselves', shows that Coalescence applies, but it is not clear again
which vowel has been deleted.

    One possibility is that the /-a-/ morpheme first triggers Coalescence
with the following /-i-/ , changing /i/ to intermediate /e/ while /-a-/
retains its height. Then, /-a-/ is deleted, leaving the a of the subject
marker to coalesce with the newly created /e/ tc produce superficial -ee- .
Another possibility is that Coalescence applies iteratively to produce an in-
termediate sequence of /βe-e-e-lum-a/ , which is subsequently shortened by
/-a-/ Reduction to βeeluma . We cannot yet determine which of these alterna-
tives is correct.

    Another set of alternations are those in which i-final subject prefixes
precede /-a-/ .

(10) /li-a-ar-a/   →   liara
        cl.5 SM-a-split-T/A   'it split'

/βi-a-or-a/   →   βiora
c1.2 SM-a-bask-T/A   'they basked'

/tsi-a-i-lum-a/   →   tsieluma
c1.10 SM-a-refl-bite-T/A   'they bit themselves'

Recall our earlier statement about the devocalization of i before /-a-/ and a consonant (see the data in (7) and the following discussion.) That itself was a special situation, since i does not devocalize unless surrounded by vowels. The examples here in (10) do not show devocalization of i , yet there has been /-a-/ Reduction. This special devocalization of /i/ before /-a-/ and a consonant would be correctly blocked in the forms in (10) if the rule is stipulated to apply before /-a-/ Reduction, since at that point a consonant does not follow /-a-/ . It will be recalled that Glide Formation of both /u/ and /i/ was posited as applying before /-a-/ Reduction for the forms of (8) as well, thus allowing us to maintain the same rule ordering for different data.

Glide formation and /-a-/ Reduction appear in data where /-a-/ is preceded by u-final prefixes and followed by a vowel-initial root or by the reflexive marker.

(11) /xu-a-ar-a/   →   xwaara
1pl. SM-a-split-T/A   'we split'

/mu-a-or-a/   →   mwoora
2pl. SM-a-bask-T/A   'you basked'

/lu-a-i-fiimb-a/   →   lweefiimba
c1.11 SM-a-refl-cover-T/A   'it covered itself'

In keeping with previous findings, it should be proposed that Glide Formation (with Compensatory Lengthening) and Coalescence apply before /-a-/ Reduction.

We may now summarize our discussion of the forms in 3.2 by proposing the following rule-orderings and derivations:

(12) Underlying   /βa-a-i-lum-a/   /li-a-ar̥-a/   /mu-a-or-a/

      Glide Form. &   ---   ---   mw-aa-or-a
      Comp. Length.

      Coalescence   βe-ee-lum-a   ---   mw-oo-or-a

      /-a-/ Reduct.   βe-e-lum-a   li--ar-a   mw-o-or-a

      Surface   [βeeluma]   [liara]   [mwoora]

Note that similar rule-orderings will account for the data of 3.1 as well:

(13) Underlying   /xu-a-lum-a/   /li-a-ar-a/   /li-a-fiimb-a/

      Glide Form. &   xw-aa-lum-a   ---   ly-aa-fiimb-a
      Comp. Length.

      Coalescence   ---   ---   ---

      /-a-/ Reduct.   xw-a-lum-a   li--ar-a   ly-a-fiimb-a

      Surface   [xwaluma]   [liara]   [lyafiimba]

Finally, note that in all these forms, the rule of y Insertion (∅ → y
/VV__V) never applies. If we order this rule after /-a-/ Reduction, the for-
mer will be correctly blocked from applying.

     The rule of /-a-/ Reduction then will be understood to operate on identi-
cal sequences formed with /-a-/ , reducing such sequences by one vowel mora.

3.3. /nd-/ prefixed forms and /-a-/ Reduction. At this point it will be
useful to present some data involving first person singular subject prefixes
followed by /-a-/ . I consider the first person singular subject marker to
be underlying /nd-/ .[5] This morpheme is the only consonant-final subject
prefix in the language (the corresponding first person singular object marker,
/N/ , is the only consonant-final object marker). As we shall see, this is a
significant factor.

_____

     [5]Another possibility is that this morpheme is /ndi-/ , which does in fact
surface in other paradigms. The language is, however, riddled with alterna-
tive forms for first person singular subject, among them /ndi-/ , /eN/ ,
/e/ , so one more alternate isn't too unlikely. And even if /ndi-/ were to
be posited underlyingly, we would still need special rules and conditions
that would be peculiar to first person singular forms, the area in which excep-
tions proliferate. For the purposes of this paper, the postulation of /nd-/
or /ndi-/ makes very little difference.

The alternations with this morpheme and /-a-/ will seem surprising:

(14) /nd-a-fiimb-a/   →   ndafiimba
   1sg SM-a-cover-T/A   'I covered'

   /nd-a-lum-a/   →   ndaluma
   1sg SM-a-bite-T/A   'I bit'

   /nd-a-ar-a/   →   ndaara
   1sg SM-a-split-T/A   'I split'

   /nd-a-or-a/   →   ndoora
   1sg SM-a-bask-T/A   'I basked'

   /nd-a-i-fiimb-a/   →   ndeefiimba
   1sg SM-a-refl-cover-T/A   'I covered myself'

These forms indicate that /-a-/ Reduction has not applied, since the underlying number of vowel morae surface unchanged. Of course, the first two forms, ndafiimba and ndaluma would not be expected to reduce their vowels, since there is only one vowel, the /-a-/ itself, and we had formulated the rule of /-a-/ Reduction to apply to identical vowel sequences formed with /-a-/ . It is the last three forms that provide the puzzling results, since they might be expected to produce *ndara , *ndora , and *ndefiimba respectively. Note that Coalescence applies as expected in the last two forms but that there is no reduction of the vowels.

Since these forms are the only exceptions to the rule of /-a-/ Reduction, and since they are, nevertheless, a significant set of exceptions (the first person singular form occurs so frequently in discourse), they merit some discussion. It is here that we shall introduce the notion of the role of paradigm pressure in forcing exceptions to /-a-/ Reduction.

If we compare the /nd-/ prefixed forms with corresponding forms of the same paradigmatic type—and by this we mean that /-a-/ is followed by the same type of element, C-initial root or V-initial morpheme—we see that there is good reason for /nd-/ prefixed forms to be exceptions to /-a-/ Reduction.

Consider first instances in which consonants followed /-a-/ , as in (7) earlier. There we saw forms like /li-a-fiimb-a/ surface as lyafiimba 'it covered', /βa-a-fiimb-a/ appearing as βafiimba 'they covered', and /xu-a-

lum-a/ as xwaluma 'we bit'. In this paradigm, one vowel surfaces when
/-a-/ is followed by a consonant. /nd-a-fiimba/ then fits right in when it
surfaces as ndafiimba 'I covered' since only one vowel mora surfaces here,
too.

Then, when /-a-/ is followed by a vowel, as in (9), we saw that
/βa-a-ar-a/ appeared as βaara 'they split', while /ka-a-or-a/ surfaced as
koora 'they basked', and /βa-a-i-lum-a/ became βeeluma 'they bit them-
selves'. In this paradigm, two vowels surface when /-a-/ is followed by a
vowel. Again, forms like /nd-a-ar-a/ → ndaara 'I split', /nd-a-or-a/ →
ndoora 'I basked', and /nd-a-i-fiimb-a/ → ndeefiimba 'I covered myself'
fit in, since they surface with two vowels as well. With such complicated se-
quences of underlying vowels, there would seem to be good reason to maintain
superficial similarity in the number of vowel morae, even at the cost of creat-
ing an (important) set of exceptions to the rule of /-a-/ Reduction.

We will see that /nd-/ prefixed forms are exceptions throughout the /-a-/
Reduction forms, but in all cases, the power of the paradigm would seem to be
a reasonable justification for such exceptions.

3.4. Sequences of /-a-/ followed by two vowels. When the underlying se-
quence of subject marker /-a-/ , reflexive marker /-i-/ , and a vowel-initial
root occur, we find evidence that /-a-/ Reduction occurs, and y Insertion,
Glide Formation, and Coalescence take place as well:

(15)	Underlying	/βa-a-i-ar-a/	/xu-a-i-ar-a/	/li-a-i-ar-a/
	Coalescence	βe-ee-ara	xu-ee-ara	li-ee-ara
	Glide Formation & Comp. Length.	---	xw-eee-ara	---
	/-a-/ Reduction	βe-e-ara	xw-ee-ara	li-e-ara
	y Insertion (∅ → y /VV__V)	βee-y-ara	xw-ee-y-ara	li-e-y-ara
	Surface	[βeeyara]	[xweeyara]	[lieyara]
		'they split themselves'	'we split ourselves'	'it split itself'

Note that the special rule of Glide Formation for i- final prefixes that

was necessary earlier for forms in (7), that is, when /-a-/ was followed by
a consonant, does not apply here, since /-a-/ is followed by a vowel at the
time this special devocalization would apply. The rule orderings posited for
earlier data hold up here as well, with Glide Formation and Coalescence pre-
ceding /-a-/ Reduction, and y Insertion following /-a-/ Reduction (cf. 3.2).

Forms with /nd-/ prefixes behave "exceptionally" as expected in this con-
text. From underlying /nd-a-i-ara/ comes surface ndeeyara , indicating
that, as before, /-a-/ Reduction does not apply. But notice again that as
with the other prefixes, when two vowels follow /-a-/ in underlying struc-
ture, two vowels surface after "a" , with y inserted right where it belongs.
If /nd-/ prefixed forms were to "correctly" undergo /-a-/ Reduction, this
pattern would be destroyed.

3.5. <u>/-a-/ followed by nasal clusters</u>. We saw in (6) evidence that a rule
of Pre-nasal Cluster Lengthening (PNCL) applies. We now turn to the interac-
tion of the reduction rule of /-a-/ and the lengthening rule of PNCL.

The first person singular object marker /N/ appears after /-a-/ and be-
fore the root; no other prefix may intervene between them. Consider these un-
derlying and surface forms:

(16) /βa-a-N-βaamb-a/   →   βaambaamba
      cl.2 SM-a-1sg OM-sacrifice-T   'they sacrificed me'

      /li-a-N-ram-a/   →   liandama
      cl.1 SM-a-1sg OM-defeat-T   'it defeats me'

      /ku-a-N-chiing-a/   →   kwaanjiinga
      cl.3 SM-a-1sg OM-carry-T   'it carried me'

To account for these forms, the following derivations are proposed:

(17) Underlying   /βa-a-N-βaamba/   /li-a-N-rama/   /ku-a-N-chiinga/

      PNCL   βa-aa-N-βaamba   li-aa-N-rama   ku-aa-N-chiinga

      Glide Formation &   ---   ---   kw-aaa-N-chiinga
      Comp. Length.

      /-a-/ Reduction   βa-a-N-βaamba   li-a-N-rama   kw-aa-N-chiinga

      y Insertion   ---   ---   ---

Nasal Rules	βa-a-m-baamba	li-a-n-dama	kw-aa-n-jiinga
Surface	[βaambaamba]	[liandama]	[kwaanjiinga]

We have ordered the rule of Glide Formation to precede /-a-/ Reduction as was done in earlier contexts. Note again that the special devocalization of i is correctly blocked by this ordering, since once PNCL applies, /-a-/ is not directly followed by a consonant.

We have no opportunity to see what would happen if /nd-/ prefixed forms were to appear before /N/ . Since both elements refer to first person singular, the reflexivization rule would spell /N/ as /-i-/ , and there would be no environment for PNCL. Furthermore, there are no nasal-cluster initial roots before which /-a-/ could appear and interact with the rule of PNCL.

3.6. Summary. To reiterate, the rule of /-a-/ Reduction and the special exceptions that are necessary to accompany it have a unified purpose. /-a-/ Reduction is itself a special, morphologically conditioned rule that is unlike all other rules in the language involving vowel sequences (except PNCL) because it affects the number of vowel morae that surface; it is the only true deletion rule involving vowels. Yet, this rule has exceptions, or triggers the application of an exceptional rule, precisely when such exceptions contribute to a uniform paradigm. First, the exception to the rule of /-a-/ Reduction is all the /nd-/ prefixed forms, which, as it were, start off with fewer underlying vowel morae, because /nd-/ is the only C-final subject prefix in the language (and only subject prefixes and the reflexive marker appear before /-a-/). The failure of /-a-/ Reduction to apply to the /nd-/ prefixed forms ensures that all the forms of the same paradigm (where paradigm is definable in terms of the number of vowel morae following /-a-/) surface with the same number of vowel morae, albeit one less mora when /-a-/ Reduction has applied.

Secondly, the special rule of Devocalization of i when the sequence of /-a-/ + C follows also has the function of ensuring that an equal number of vowel morae surface within a paradigm. /-a-/ Reduction could not have applied to a form like /li-a-fiimba/ , because there would have been no sequences of identical vowels formed from /-a-/ to reduce. The resulting surface form

*liafiimba would have two superficial vowel morae, while the rest of the forms of that paradigm have only one. The chaos that would have resulted from such a situation has been avoided by the complication of rules and exceptions we have developed herein.

It turns out that /-a-/ Reduction and its exceptions work together to avoid homophony in certain other contexts. In the next section, we show how the principle of avoidance of homonyms is a factor affecting /-a-/ Reduction and exceptions.

4. Alternations with /-aa-/

This section discusses the morpheme /-aa-/ , a marker of one of the many perfect tenses in OluTsootso. This marker resembles strongly in form, function, and vocalic phenomena the /-a-/ morpheme discussed above. We shall have recourse once again to the notion of paradigm and also to the principle of avoidance of homophony for forms involving /-a-/ and forms involving /-aa-/ .

4.1. /-aa-/ + Consonant.
In forms like the following, we see that /-aa-/ involves some sort of reduction:

(18) /li-aa-fiimb-a/ → liafiimba
     cl.5 SM-aa-cover-T   'it has already covered'[6]

/βa-aa-lum-a/ → βaaluma
cl.2 SM-aa-bite-T   'they have a. bit'

/xu-aa-βaamb-a/ → xwaaβaamba
1pl SM-aa-sacrifice-T   'we have a. sacrificed'

It might first be thought that in fact we have simply underlying /-a-/ and no reduction in these forms rather than /-aa-/ and reduction. Two sets of data vitiate this claim. First, /li-aa-i-fiimb-a/ surfaces as lyayeefiimba 'it has a. covered itself'. This form and other related forms

---

[6]The morpheme /-aa-/ appears here and in many additional tenses of the past and perfect. The glosses are approximate. I abbreviate "already" as "a." in remaining forms.

show surface a after the first y and show. ee that can only have resulted
from the underlying sequence of /a+i/ .. Secondly, /nd-aa-fiimb-a/ surfaces
as ndaafiimba 'I have a. covered' without reduction, clearly showing the
need for two underlying morae. Both sets of data will be discussed fully be-
low; the important point here is to justify the postulation of /-aa-/ under-
lyingly.

    To account now for the forms of (18), it is proposed that the following
derivations apply:

(19) Underlying   /li-aa-fiimb-a/   /βa-aa-lum-a/   /xu-aa-βaamb-a/

      Glide Formation &   ---   ---   xw-aaa-βaamb-a
      Comp. Length.

      /-a-/ Reduction   li-a-fiimba   βa-a-luma   xw-aa-βaamba

      y Insertion   ---   ---   ---
      (∅ → y /VV__V)

      Surface   [liafiimba]   [βaaluma]   [xwaaluma]

    Note that we do not see special devocalization of i in liafiimba . We
might claim that the first of the two underlying a's is the /-a-/ from the
previous section, and so when it is followed by a vowel, in this case the sec-
ond a , special devocalization is blocked.

    Rather than have a new reduction rule apply to forms involving /-aa-/ ,
it would seem to make more sense to claim that the regular rule of /-a-/ Re-
duction then applies, affecting sequences of two identical vowels involving
underlying /-a-/ . The rule of y Insertion is correctly blocked from apply-
ing to these forms, since it is ordered after /-a-/ Reduction.

    Note again that a paradigmatic structure of syllable structure emerges
from these data. When a consonant follows /-aa-/ , two vowel morae surface.

4.2. /nd-/ and /-aa-/ forms. This pattern emerges again when we consider
/nd-/ prefixed forms preceding /-aa-/ :

(20) /nd-aa-fiimb-a/   →   ndaafiimba
         1sg SM-aa-cover-T   'I have a. covered'

      /nd-aa-lum-a/   →   ndaaluma
         1sg SM-aa-bite-T   'I have a. bit'

The expected application of /-a-/ Reduction should no longer be expected
in light of our earlier discussion. If /-a-/ Reduction were to apply here,
the first person singular forms would be isolated from all the other forms of
this paradigm by having only one superficial vowel mora. One motivation then
for /-a-/ Reduction not to apply here is the same we saw earlier: the ten-
dency in the language to maintain paradigm uniformity overriding the regular
application of rules.

It is worthwhile to mention in passing that a second motivation for disal-
lowing the application of /-a-/ Reduction would be to prevent homophony. If
we compare the first two forms of (14) with those in (20), we see that if
/-a-/ Reduction had applied in (20), the forms in each set would be identical.
Avoidance of homonyms is a factor in many of the other forms in this discus-
sion.

4.3. /-aa-/ + Vowel. The situation becomes a little more complicated when we
consider sequences of vowels following the /-aa-/ marker. Consider first
the following instances of /-aa-/ followed by the reflexive marker /-i-/
and a C-initial root:

(21) /nd-aa-i-fiimb-a/   →   ndayeefiimba
        1sg SM-aa-R-cover-T   'I have a. covered myself'

      /li-aa-i-fiimb-a/   →   lyayeefiimba
        cl.5 SM-aa-R-cover-T   'it has a. covered itself'

      /βa-aa-i-lum-a/   →   βayeefiimba
        cl.2 SM-aa-R-bite-T   'they have a. bitten themselves'

      /xu-aa-i-lum-a/   →   xwayeeluma
        1pl SM-aa-R-bite-T   'we have a. bitten ourselves'

The first person singular form shows clearly that the rule of y Insertion
($\emptyset$ → y /VV__V) invoked earlier is not applicable, yet an extra y appears.
However, true to form, the first person singular forms do not exhibit evidence
of /-a-/ Reduction, since we do not have *ndayefiimba , with a single e .

Turning now to the surface form of lyayeefiimba , we see that special de-
vocalization of i has applied, a y has been inserted, coalescence and re-

duction have taken place. If we were to order y Insertion ($\emptyset \rightarrow$ y / VV__V)
before /-a-/ Reduction, we could have it apply to the underlying form and pro-
duce the right output, but this is not what we have found in earlier contexts,
where it was clear that y Insertion follows /-a-/ Reduction (cf. (13), (15),
and (17)). And we would still be unable to do anything about the /nd-/ pre-
fixed forms, since the phonetic environment for y Insertion is not even met.

We must invoke a special rule of y Insertion to apply to break up se-
quences involving /-aa-/ followed by a vowel. Such a rule is necessary for
/nd-/ forms and to maintain the rule orderings we have successfully motivated
elsewhere. This rule will than apply very early in the derivation, and will
account for all the forms of (21).

(22) Underlying
      /nd-aa-i-fiimba/   /li-aa-i/fiimba/   /βa-aa-i-luma/   /xu-aa-i-luma/
      Special y Insertion
       nd-a-y-a-i-fiimba li-a-y-a-i-fiimba βa-aya-i-luma   xu-aya-luma
      Coalescence
       nd-a-yee-fiimba   li-a-yee-fiimba   βa-a-yee-luma   xu-a-yeeluma
      Glide formation & Comp. Length.
            ---   ly-aa-yee-fiimba   ---   xw-aa-yee-luma
      /-a-/ Reduction
            ---   ly-a-yee-fiimba   βa-yee-luma   xwa-yee-luma
      y Insertion
            ---   ---   ---   ---
      Surface
      [ndayeefiimba]   [lyayeefiimba]   [βayeeluma]   [xwayeeluma]

Note that the special devocalization of i is properly triggered by the
intermediate form /li-a-y-a-i-fiimba/ created by Special y Insertion for se-
quences of /-aa-/ and a vowel. Once the y is there, special devocaliza-
tion and Compensatory Lengthening of the prefixal-final i can apply.

Lest it be thought that Special y Insertion is really just the regular
rule in disguise, there are forms which indicate that both rules have applied.
This occurs when /-aa-/ is followed by /-i-/ and a vowel-initial root:

(23)   /nd-aa-i-ira/   →   ndayeeyira
       1sg SM-aa-R-kill   'I have a. killed myself'

       /li-aa-i-ira/   →   lyayeeyira
       cl.5 SM-aa-R-kill   'it has a. killed itself'

       /xu-aa-i-osia/   →   xwayeeyosia
       1pl SM-aa-R-warm   'we have a. warmed ourselves'

       /βa-aa-i-umia/   →   βayeeyumia
       cl.2 SM-aa-R-dry   'they have a. dried themselves'

The derivations of these forms would follow the same order as we saw earli-
er. Special y Insertion for sequences of /-aa-/ applies, yielding interme-
diate /nd-a-y-a-ira/ , /li-a-y-a-i-ira/ , /xu-a-y-a-i-osia/ , and
/βa-a-y-a-i-umia/ , respectively. Coalescence applies to all the forms to give
us the necessary -ee- sequences, and then glide formation with compensatory
lengthening applies to /li-a-yee-ira/ and /xu-a-yee-osia/ to produce
/ly-aa-yee-ira/ and /xw-aa-yee-osia/ . The rule of /-a-/ Reduction would
then apply to all forms except the first person form /nd-a-y-ee-ira/ , produc-
ing /ly-a-yee-ira/, /xw-a-yee-osia/ , and /βa-yee-umia/ , respectively. The
regular rule of y Insertion then applies, and we obtain [ndayeeyira] ,
[lyayeeyira] , [xwayeeyosia] , and [βayeeyumia] .

4.4. /-aa-/ and PNCL. When the first person singular object marker /N/
follows /-aa-/ , the environment for PNCL is met, and there is interaction of
/-a-/ Reduction, PNCL, and Special y Insertion:

(24)   /li-aa-N-chiinga/   →   lyayaanjiinga
       cl.5 SM-aa-1sg OM-carry   'it has a. carried me'

       /ku-aa-N-chiinga/   →   kwayaanjiinga
       cl.3 SM-aa-1sg OM-carry   'it has a. carried me'

       /βa-aa-N-rama/   →   βayaandama
       xl.2 SM-aa-1sg OM-defeat   'they have a. defeated me'

Derivations are provided in (25):

(25)

Underlying	/li-aa-N-chiinga/	/ku-aa-N-chiinga/	/βa-aa-N-rama/
PNCL	li-aaa-N-chiinga	ku-aaa-N-chiinga	βa-aaa-N-rama
Special γ Insertion	li-ayaa-N-chiinga	ku-ayaa-N-chiinga	βa-ayaa-N-rama
Glide Formation & Comp. Length.	ly-aayaa-N-chiinga	kw-aayaa-N-chiinga	---
/-a-/ Reduction	ly-a-yaa-N-chiinga	kw-a-yaa-N-chinga	βa-yaa-N-ram
nasal interactions; Surface	[lyayaanjiinga]	[kwayaanjiinga]	[βayaandama]

With the addition of the Special γ Insertion for /-aa-/ , the data are accounted for, and previously motivated rules and rule orderings have been maintained.

5.   /-aa-/ + Vowel-initial Roots

The discussion has deliberately bypassed a set of data that seem most anomalous and exceptional, the cases where /-aa-/ is directly followed by a vowel-initial root. These forms are exceptional, but as we shall see, without this exceptionality, an overwhelming amount of homophony would result.

5.1.   Data.   Initial data are presented in (26):

(26)   /nd-aa-iβa/   →   ndayeβa
       1 sg SM-aa-steal   'I have a. stolen'

       /li-aa-ira/   →   lyayera
       cl.5 SM-aa-kill   'it has a. killed'

       /xu-aa-ula/   →   xwayola
       1pl SM-aa-arrive   'we have a. arrived'

       /βa-aa-ara/   →   βayara
       cl.2 SM-aa-split   'they have a. split'

The first problem is that the first person singular subject forms, like ndayeβa , seem to have undergone some reduction, a clear violation of all that has gone before, where all first person singular subject forms were exceptions to the reduction process. This includes cases where /-a-/ was followed by a vowel-initial root and when both /-a-/ and /-aa-/ were followed

by the reflexive marker /-i-/ (with or without yet another vowel following).

Secondly, there seems to be evidence from the last three examples that *two*
kinds of reduction have taken place, since vowels on both sides of the insert-
ed y are short. This, too, is not in keeping with what we have seen every-
where, since in all other cases reduction involved only one vowel (note (22)
and (23)). Given derivations and rule orderings from earlier data, we may pro-
pose the following derivation for these forms:

(27)

Underlying	/nd-aa-iβa/	/li-aa-ira/	/xu-aa-ula/	/βa-aa-ara/
Special y Insertion	nd-aya-iβa	li-aya-ira	xu-aya-ula	βa-aya-ara
Coalescence	nd-aye-eβa	li-aye-era	xu-ayo-ola	---
Glide Formation & Comp. Length.	---	ly-aaye-era	xw-aayo-ola	---

At this point we see that the rule of /-a-/ Reduction should apply. In
previous cases where /-a-/ Reduction applied with the marker /-aa-/, it was
always the *first* [a] that was involved in the reduction, never the second
(cf. (19), (21), (22), and (23)). We can salvage something if that generaliza-
tion is maintained, as below:

(27) continued

/-a-/ Reduction	---	ly-aye-era	xw-ayo-ola	βa-ya-ara

We see on closer examination that the /nd-/ prefixed form can still be an
exception to our "regular" rule of /-a-/ Reduction, but that is at least in
keeping with what went before. What remains is to propose a special rule of
reduction for sequences involving the *second* [a] of /-aa-/ when a vowel-
initial root directly follows. This rule is special in that it now applies to
/nd-/ prefixed forms, but it involves the second [a] of /-aa-/ :

(27) continued

Special Reduction	nd-ayeβa	ly-ayera	xw-ayola	βa-yara
Surface	[ndayeβa]	[lyayera]	[xwayola]	[βayara]

Note that we were able to maintain our regularity about the exceptionality

of /-a-/ Reduction for /nd-/ prefixed forms, because that rule of reduction
still does not apply to these forms. Happily, the correct non-application of
that rule, combined with the special application of Special Reduction for
these forms, maintains a consistent profile for the forms of that paradigm.

5.2. <u>Avoidance of homophony</u>. Two sets of data suggest that an appeal to the
avoidance of homophony is appropriate for accounting for much of this excep-
tionality. The first set of data involves certain i-initial verb roots which
are homophonous with consonant-initial roots that are preceded by the reflex-
ive marker /-i-/ .

(28) <u>i-initial root</u>   <u>/-i/ + C-initial root</u>
      /ikul/   'open'   /i-kul/   'buy (for) self'
      /ilim/   'get dark'   /i-lim/   'cultivate self'
      /ir/   'kill'   /i-r/   'put self'

     Other such forms are listed in Dalgish [1976]. If we examine some of
these verbs in the perfect tense with /-aa-/ , we can see that potentially
homophonous forms are kept distinct by Special Reduction, which applies to the
verbs in the left column (i-initial verbs), but not to the verbs in the right
(when reflexive /-i-/ precedes a consonant-initial root:

(29) a.   /βa-aa-ikula/   →   βayekula   'they have a. opened'
          /βa-aa-i-kula/   →   βayeekula   'they have a. bought themselves...

     b.   /nd-aa-ilima/   →   ndayelima   'I have a. gotten dark'
          /nd-aa-i-lima/   →   ndayeelima   'I have a. cultivated myself'

     c.   /li-aa-ira/   →   lyayera   'it has a. killed'
          /li-aa-i-ra/   →   lyayeera   'it has a. put itself'

     The crucial difference between these forms is the length of the vowel
-e- . It is long if it is underlyingly the reflexive marker and short if un-
derlyingly root-initial i . The rule separating these vowels is Special Re-
duction.

     The second set of data pointing toward the principle of avoidance of homo-
phony is certain y-initial roots vs. certain vowel-initial roots. In Olu-

Tsootso, there are a number of y-initial roots that differ from vowel-initial roots only in the length of the first vowel. Again, a more exhaustive list is provided in Dalgish [1976], but a few forms are listed in (30):

(30)   y-initial roots   *vowel*-initial roots

   yaanz   'like'   anz   'arrange'

   yeel   'land, set'   el   'select'

   yeeng   'brew'   eng   'ripen'

Now, compare the y-initial verb roots in the distant past tense with the vowel-initial roots in the perfect tense:

(31)   y-initials, /-a-/   vowel-initials, /-aa-/

   /li-a-yaanza/ → lyayaanza   /li-aa-anza/ → lyayanza
            'it liked'   'it has a. arranged'

   /ku-a-yeela/ → kwayeela   /ku-aa-ela/ → kwayela
            'it set'   'it has a. selected'

   /βa-a-yeenga/ → βayeenga   /βa-aa-enga/ → βayenga
            'they brewed'   'they have a. ripened'

Without Special Reduction affecting the second vowel of /-aa-/ before a vowel-initial root, the verbs in both columns would surface with long -ee- and be homophonous. In addition, a few other forms are dept distinct by this exceptional rule: compare /nd-a-yeexa/ → ndayeexa 'I leaned' and /nd-aa-ixa/ → ndayexa 'I have a. sat'. The exceptional reduction then has a clear and important function in reducing potential ambiguity resulting from homophony.

6. Conclusion

   This paper has started with some of the more direct and simpler vocalic alternations, introduced the /-a-/ marker and the reduction rule necessary for its alternations, and concluded with a discussion of certain seemingly ad-hoc additional rules, exceptions, and conditions which turn out to be motivated by two important considerations: the power of the paradigm and the avoidance of homophony. We saw that /nd-/ prefixed forms were consistently exceptional to the rule of /-a-/ Reduction, but with good reason: all related

forms in the paradigm then surface with the same number of vowel morae. And
we had need for an additional, special rule of reduction for /-aa-/ and vow-
el-initial roots, which, it turned out, helped to prevent homophony between
forms in the same tense and certain other forms in different tenses. These
two forces in the language accompany and in some sense justify exceptions and
conditions to otherwise regular and complicated phenomena.

REFERENCES

Dalgish, Gerard M. 1976. "The morphophonemics of the OluTsootso dialect of
        (Olu)Luyia: issues and implications." Unpublished doctoral disserta-
        tion, University of Illinois, Urbana, Illinois.

Dalgish, Gerard M. 1977. "Past tense formation in OruHaya." *African Lan-
        guages/Langues africaines* 3:78-92.

Kisseberth, Charles W. 1976. "A morphophonemic rule in Chi-Mwi:ni: evidence
        from loan words." *Studies in Language Learning* 1(2):205-218.

LEXICALIZING DIRECTIONAL AND NONDIRECTIONAL MOTION
IN EMAI[1]

Ronald P. Schaefer
University of Kansas

Motion expressions in Emai, an Edoid language of Nigeria,
are examined within the lexical typology of Talmy [1985].
Both directional and nondirectional motion structures in-
volving the MANNER verb |a 'to run' are analyzed, though
only the former, syntactically expressed by verbs in con-
tinuous series, poses a particular problem for interpreta-
tion. Three hypotheses concerning the semantic composition
of these serial verbs are considered and evaluated in terms
of their distributional constraints. It is concluded that
nondirectional motion can be lexicalized by either of two
patterns [MOTION+MANNER] PATH or MOTION PATH...MANNER,
while directional motion allows only the single lexicaliza-
tion pattern MANNER [MOTION+PATH]. Typologically, these
reflect two of the incorporation patterns Talmy has iden-
tified as characteristic in languages of the world.

0. Introduction

This paper examines lexicalization processes in Emai, an Edoid language of

Bendel State, Nigeria.[2] It is concerned with the different patterns by which

surface level morphemes realize elements common to the semantic structuring of

---

[2]Emai constitutes one third of the Emai-Ora-Iuleha dialect cluster spoken
in Owan Local Government Area of Bendel State, Nigeria. It is classified
within the Kwa family as North Central Edoid by Hansford, Bendor-Samuel, and
Stanford [1976].

motion situations. Narrowing analysis in this fashion reveals some of the more salient properties of structurally significant lexical items in the field of motion and, in addition, affords an opportunity to explore interrelation-ships between lexicalization processes and sentence structure.

In order to carry out this task, the theoretical framework of Talmy [1972, 1975, 1985] is employed. This model, arising from analysis of the motion do-main in a number of unrelated natural languages, has delineated a typology of relevant lexicalization processes. As applied here they allow the specific patterns in Emai to be placed in a wider perspective, enhancing our apprecia-tion of their potentially universal properties. A brief overview of the Talmy model follows.

1. Talmy's Model

Analysis could not begin without a consensus, however tentative and inex-act, about what constitutes a motion event and how it is delineated at the se-mantic level. For Talmy [1975, 1985] a motion event is basically viewed as one object moving or located with respect to another.[3] At the semantic level this configuration is codified by the components FIGURE, MOTION, PATH, GROUND, and MANNER, with MOTION being further specified as either MOVE, i.e. direc-tional motion, or BE LOCATED, i.e. nondirectional motion.

Each of these principal components, especially MOTION, PATH, and MANNER, will be briefly identified and illustrated so that their role in different pat-terns of lexicalization become more familiar. To achieve this goal, our at-tention will focus on surface level verb roots with respect to their incorpor-ation of motion components. A priori, a number of incorporation types are possible, e.g. FIGURE+PATH, MOTION+GROUND, MOTION+PATH, etc., but cross-lin-guistic evidence gathered by Talmy [1985] argues that only three predominate in natural language, each involving the element MOTION and one of the remain-ing components except GROUND. Two of these lexicalization patterns, MOTION+ MANNER and MOTION+PATH, are relevant for the present study.

---

[3]A similarly broad use of the term "motion" is found in Langacker [1982, 1985].

    To clarify our understanding of Talmy's framework, let us consider exam-
ples in English where no incorporation takes place, the directional and nondi-
rectional sentences below.

(1) a. The man moved into the house.

    b. The man was in the house.

    In each of these *man* functions as the FIGURE, the moving object in the di-
rectional structure (1a) as well as the object to be located in the nondirec-
tional (1b). The object with respect to which the FIGURE moves or is located,
the GROUND, is indicated by *house*. As for PATH, which refers to the course
followed or site occupied by the FIGURE, it is realized by the preposition *into*
in (1a) and *in* in (1b). Finally, the component MOTION, further specified as
MOVE or BE-LOCATED, indicates that reference is being made to the movement or
location of an object. It is registered in the sentences of (1) by the verbs
moved and *was*. To this point, however, our analysis is hardly more than a re-
interpretation of traditional parts of speech.

    A minimally specified motion event as seen above can be augmented through
the expression of MANNER. As an example of how this component can be realized
among surface level verb roots, consider the ensuing English constructions.

(2) a. The man is running into the house.

    b. The man is running in the house.

    Here the functions of FIGURE and GROUND are realized, as in (1), by *man*
and *house*, respectively, and similarly PATH is realized by *into* and *in*. As
for the fact of MOTION, it is expressed in (2) by the verb *running*. More per-
tinent is this verb's incorporation of how the event takes place, i.e. running,
thereby establishing a MOTION+MANNER lexicalization type. It is through such
analysis that the characteristic pattern for specifying MANNER in English,
Chinese, and most Indo-European languages has been identified by Talmy [1985].
As highlighted below, this pattern is not characteristic for all languages.

    A second pattern allowing for the specification of MANNER is characteris-
tic of Romance, Samoan and Semitic languages. By way of borrowing through
French [Talmy 1972, 1985], it can be illustrated with the English example in

(3), where again the main verb root is the focus of attention.

(3)   The man entered the house (by) running.

For ease of analysis the FIGURE and GROUND elements maintain agreement
with the earlier sentences, leaving us to identify the placement of MOTION,
PATH, and MANNER among surface level morphemes. Of these, MOTION and the di-
rectional PATH are incorporated in the main verb *entered*, more analytically
rendered as 'move into'. Lexicalizing MOTION+PATH in the verb root, it should
be noticed, contrasts with the MOTION+MANNER pattern established by (2), and
as for MANNER in (3), it is specified at the surface level by the adjunct *run-
ning*. Our attention therefore rests on the verb of the main clause which does
not incorporate MANNER and the adjunct which does not incorporate MOTION.

Though perhaps too briefly outlined, the preceding sentences reveal typo-
logical patterns of semantic incorporation. One pattern, e.g., *the man is run-
ning into the house*, employs a main verb incorporating both the fact of MOTION
and its MANNER of occurrence, but expresses PATH through a separate lexical
item, i.e. *into*. A contrasting pattern, e.g. *the man entered the house run-
ning*, relies on the coalescence of both MOTION and PATH concepts in the main
clause verb root, but expresses MANNER in a separate phrase, *running*. Still a
third pattern is evident among Hokan languages of California, but its non-oc-
currence in Emai allows us to set it aside for the present.[4]

2.   MOTION in Emai

It is obvious that the entire range of sentences used to express motion in
Emai cannot be examined herein. In fact, discussion will be limited to MANNER
specifying constructions and attendant lexicalization patterns involving the
verb la 'to run' as in the following.[5]

---

[4]An English sentence like *it is snowing into the attic* illustrates the
third pattern, where FIGURE+MOTION are incorporated in the verb root, *snow*.
Its more analytic paraphrase *snow moved into the attic* lays out the semantic
elements in a preincorporated fashion.

[5]Emai data are presented in an orthographic form along lines suggested in
Schaefer (n.d.), which follows the general conventions for Edoid suggested in
the *Edo Orthography Report* by using "vb" for a voiced bilabial approximant

(4) a. ọli ọmọhe la vbi oa   'the man ran in the house'
        the man   run at house

    b. ọli ọmọhe la vbi isao isi oa   'the man ran in front of the house'
        the man   run at front of house

    c. ọli ọmọhe la vbi uokho isi oa   'the man ran in back of the house'
        the man   run at back of house

A factor common to the meaning of these sentences is their reference to
nondirectional motion or positional location. That is, the movement of the FI-
GURE object, ọmọhe , is confined to a location defined by the GROUND, oa ,
i.e. the running event is confined to the inside of the house or a specified
area adjacent to the house.

A second type of motion structure is illustrated in (5a) and (5c). In con-
trast to (4), the movement of the FIGURE object ọmọhe is not circumscribed
by the GROUND location; rather, the FIGURE's movement is directed through
space in a fashion relative to the GROUND: the movement of ọmọhe is direct-
ed into or out of the location specified by oa . Continuing to assign motion
components to the remaining morphemes of (5a) and (5c), however, illustrates a
dilemma whose solution sheds some light on the intimate relationship between
lexicalization processes and grammatical structure in serial verb configura-
tions.

(5) a. ọli ọmọhe la o vbi oa   'the man ran into the house'[6]
        the man   at house

    b. ọli ọmọhe o   vbi oa   'the man entered the house'
        the man   enter at house

    c. ọli ọmọhe la shọ vbi oa   re   'the man ran out of the house'
        the man   at   house

    d. ọli ọmọhe shọ vbi oa   re   'the man left the house'[7]
        the man   leave at house

---

and by marking tone only to avoid potential ambiguity.

[6]The blank space in the literal translation of MANNER conveying sentences
is employed, since it is the goal of the present paper to determine what ele-
ments of meaning are incorporated in each of the morphemes la and o .

[7]The verb in this and the preceding sentence consists of the mutually de-
pendent forms shọ and re . They behave as a discontinuous unit.

What then is the dilemma? Basically the problem involves the semantic
composition of the verb roots la and o in directional sentences expressing
MANNER relative to the composition of la in nondirectionals of MANNER and of
o in directionals without MANNER. In languages thus far considered by the
Talmy model, a single verb root in a main clause, i.e. main verb, has consist-
ently incorporated MOTION and one other element, either MANNER, PATH, or FIG-
URE. However, a Kwa language like Emai, where serial verb structures abound,
raises a dilemma by not holding to the assumptions of this model, since in ser-
ial structures two verbs in a single surface level clause are used to refer to
a motion event [Welmers 1973].

        At first glance the dilemma appears to involve a decision as to which verb
in series one should assign main verb status. Careful analysis in the past
has revealed that strict adherence to the category arrangements of traditional
grammar may preclude insight into the grammatical structure of serials [Bam-
gbose 1973, 1974; Awobuluyi 1973]. Agreeing with this criticism, the present
analysis contends that a measure of insight may be gained by considering how
lexicalization patterns pertaining to types of events may reveal the semantic
composition of each verb in series. How then do we proceed?

        For purposes of discussion, let us compare the first sentence in each of
our earlier lists, (4a) and (5a). Examining the nondirectional sentence (4a)
(shown as (6a) below) within the Talmy framework, one would conclude that the
form la incorporates the elements MOTION+MANNER. Supporting this contention
is the assignment of the functions FIGURE and GROUND to the forms omohe and
oa , respectively. Then to the form vbi , which obligatorily occurs in such
locative complexes, the function of PATH is assigned. It remains, therefore,
for the verb la to incorporate the fact of MOTION and the MANNER in which it
is portrayed. This point is established more forcefully by examining (6b),
which differs in meaning from (6a) to the extent that sio 'crawl' differs
from la 'run'.

(6) a. oli omohe la vbi oa   'the man ran in the house'
        the man   run at house

    b. oli omohe sio   vbi oa   'the man crawled in the house'
        the man   crawl at   house

Turning now to (5a) and others of its kind, the dilemma begins to unfold.
More specifically, it involves the allocation of the elements MOTION, PATH,
and MANNER among the surface level forms la and o , given MANNERless sen-
tences like (5b) where the meaning of o 'to enter, more into' suggests that
it lexicalizes MOTION+PATH. When la , particularly in view of its MOTION+
MANNER composition in nondirectional sentences, is then combined with o ,
three hypotheses concerning their lexicalization of a directional motion event
can be identified.

An initial interpretation, labelled Hypothesis I, is to assume that in
(5a) la expresses the fact of MOTION and its running MANNER, as was postulat-
ed for (4a). It would remain for the form o to convey the directional PATH
'into', contrary to its meaning in (5b).[8] Assuming this to be the case, lexi-
calization across nondirectional and directional structures, (4a) and (5a),
would consistently include the incorporation of MOTION+MANNER in la . This
hypothesis adheres to the Talmy model and places Emai's MANNER conveying direc-
tional expressions within the typological set exemplified by English and most
of Indo-European.

An alternative, Hypothesis II, advances the proposition that the element
MOTION is expressed twice at the surface level, thus building on the serial
nature of la and o . In this case, the form la would specify MOTION+MAN-
NER and o , also incorporating MOTION, would specify MOTION+PATH. Such a
double specification of MOTION is not consistent with Talmy's semantic coding
of a motion event, though assuming a multi-clause, hence multi-main verb anal-
ysis for serial structures would lessen this inconsistency. As will be shown,
a potentially favorable aspect of this hypothesis is the compositional stabil-
ity of la across directional and nondirectional sentences and of the verb
o across MANNER and MANNERless directional expressions.

As a final hypothesis, one might assume that la in (5a) specifies only

---

[8]As for the form vbi , markers similar to it have been referred to else-
where as Secondary PATHs [Schaefer 1985], and in the case of directional mo-
tion, it marks a particular type of PATH, one which other grammatical analyses
identify with the terms Source and Goal.

MANNER and that the form o incorporates MOTION+PATH. This third analysis,
Hypothesis III, differs from the previous two by not recognizing a constant
semantic make up for la in nondirectional and directional sentences, i.e.
(4a) and (5a). It also fails to recognize for the main clause a single verb
root which, simultaneously, incorporates the component MOTION and functions as
the main verb of that clause. The merits of each of these hypotheses will now
be considered in more detail.

2.1. <u>Hypothesis I</u>. The first hypothesis under consideration proposes that in
a directional structure like (5a) la specifies the fact of MOTION and its
MANNER 'running', and o specifies PATH, 'into'. It is not difficult to rec-
ognize that under this hypothesis la is a verb and o a preposition, at
least in terms of traditional parts of speech and the kind of semantic informa-
tion each conveys. Schematically this first position is outlined in the fol-
lowing:

    la   o
    'by running move'   'into'
    MANNER+MOTION   PATH

 Hypothesis I, however, is not tenable, since the form o exhibits grammat-
ical properties typical of Emai verbs. It occurs in a focus structure where a
verb in its gerundive form is copied in the leftmost position of the clause
and followed by the marker li . For example, a nonmotion verb like e 'to
eat' in (7a) is copied in the fashion of (7b). Likewise, the form o in the
directional structure (7c) is focused in (7d). A nonverb constituent such as
the Locative marker vbi , however, cannot assume the gerundive copy form in
(7e).

(7) a. oli omọhe e eami
    the man eat meat

   'the man ate meat'

  b. uemi li oli omọhe e eami
    eating F the man eat meat

    'eating is what the man did to the meat'

c. ọli ọmọhe la o vbi oa
    the man   at house

    'the man ran into the house'

d. uomi   li ọli ọmọhe la o vbi oa
    entering F the man   at house

    'entering is what the man did by running at the house'

e. *uvbimi li ọli ọmọhe la o vbi oa
    at   F the man   at house

A second argument for rejecting Hypothesis I lies in the potential ambiguity of negative directional structures. Negatives in Emai employ the form i in Third Person Singular, which precedes the verb and any of its auxiliaries and follows the grammatical subject. (8a), which is the negative corresponding to the directional sentence (7c), has three possible readings. On one interpretation, the entire proposition, both la and o , are negated, and on the other two, either la or o , but not both, are negated, as in (8b) and (8c), respectively. Since only verbs attract the negative marker i , the form o cannot be a preposition conveying only 'into'.

(8) a. ọli ọmọhe i   la o vbi oa
      the man   not   at house

      'the man did not run into the house'

   b. ọli ọmọhe o   vbi oa   bi khi ọ i   la
      the man   enter at house with that he not run

      'the man entered the house without running'

   c. ọli ọmọhe la bi khi ọ i   o   vbi oa
      the man   run with that he not enter at house

      'the man ran without entering the house'

A third argument for rejecting Hypothesis I is the occurrence of o as the only verb in a simple directional sentence, i.e. one where MANNER is not expressed. As we have already witnessed, alongside the MANNER specifying directional (9a) there is the MANNERless (9b). With respect to the last of these, it is important to point out that o does indeed behave as a verb, for it can be focused in its gerundive form, as illustrated in (9c).

(9) a. ọli ọmọhe la o vbi oa
         the man   at house

         'the man ran into the house'

    b. ọli ọmọhe o   vbi oa
        the man   enter at house

        'the man entered the house'

    c. uomi   li ọli ọmọhe o   vbi oa
        entering F the man   enter at house

        'entering is what the man did at the house'

A final argument leading to the rejection of Hypothesis I is the tonal
identity of the two forms la and o in (9a). If Completive Aspect is refer-
red to, both must be high, if Continuous Aspect, both low.[9]

Reviewing the above facts within the limitations imposed by Talmy's inter-
pretive framework, one would conclude that the form o incorporates more than
the PATH notion 'into'. It must incorporate semantic elements sufficient for
it to assume the verb status which will permit operation of the various verb-
sensitive grammatical processes. A semantic component likely to provide this
condition is the concept MOTION. If this position can be maintained, the form
o would incorporate the elements MOTION+PATH and only the semantic composi-
tion of la would remain to be determined. Being confined to the semantic
elements advanced by Talmy, it follows that in directional structures la
would incorporate only MANNER. There is, however, a troubling fact which de-
lays acceptance of this conclusion and leads to Hypothesis II.

2.2. Hypothesis II. A fact pertinent to the directional structure in (10a)
is that not only can form o be focused, as in (10b), but la can also be
focused, as in (10c).

(10) a. ọli ọmọhe la o vbi oa
         the man   at house

         'the man ran into the house'

---

[9]In conjunction with the low tone of the verb or verbs in the sentence,
Continuous Aspect is marked by the presence of ọ with low tone in a position
preceding the leftmost verb.

b. uomi   li ǫli ǫmǫhe la o vbi oa
    entering F the man   at   house

    'entering is what the man did by running at the house'

c. ulami   li ǫli ǫmǫhe la o vbi oa
    running F   the man   at   house

    'running is how the man entered the house'

The verb-like behavior of la and o in these structures, as well as the
negation structures viewed earlier in (8), leads to another possible analysis,
especially within the serial verb nature of Emai. It may be that (10a) re-
flects a conjoined structure where la and o each incorporate a semantic
component sufficient to exhibit verb status. Borrowing from Hypothesis I
where MOTION was postulated as a component of o in order to account for its
verbal properties, one could generalize this condition to la and have it in-
corporate MOTION+MANNER. Schematically this second hypothesis is outlined be-
low:

>   la   o
>   'by running move'   'move into'
>   MOTION+MANNER   MOTION+PATH

Assuming a conjoined structure for (10a) there would be two underlying
clauses and thus two main verbs, la and o , which are juxtaposed. An inter-
pretation in which MOTION is expressed twice does not square with the number
of semantic elements Talmy employs to delineate a single motion event. On the
other hand, he sets no limitation on the number of different PATH notions
which may be expressed in a single motion event, so for the sake of argument,
let us assume there is no constraint on the number of times MOTION can occur.[10]
Should this second hypothesis prove acceptable, verbs like la would exhibit
a constant semantic composition across directional and nondirectional struc-
tures, i.e. MOTION+MANNER, as would verbs like o across MANNER and MANNER-
less constructions, i.e. MOTION+PATH. Unfortunately, there are reasons for

---

[10]Talmy relies on sentences like *Come back down from up there*, with four
consecutive PATH markers, to support his position.

rejecting this second hypothesis.

Let us consider conjoined sentences in Emai more carefully, in particular those with another set of intransitive verbs. The verbs dia 'sit, stay' and viẹ 'cry' occur in simple structures such as (11a) and (11b) and in structures like (11c), (11d), and (11e) where they are conjoined in various ways.

(11) a. ọli ọmọhe dia vbi ukpa-odẹ
         the man   sit at   road

         'the man sat on the road'

   b. ọli ọmọhe viẹ vbi ukpa-odẹ
       the man   cry at   road

       'the man cried on the road'

   c. ọli ọmọhe dia viẹ vbi ukpa-odẹ
       the man   sit cry at   road

       'the man sat and cried on the road'

   d. ọli ọmọhe dia vbi ukpa-odẹ viẹ
       the man   sit at   road   cry

       'the man sat on the road and cried'

   e. ọli ọmọhe dia vbi ukpa-odẹ viẹ vbi ọ
       the man   sit at   road   cry at it

       'the man sat on the road and cried'

These sentences will act as the basis for comparison with motion counterparts, beginning with (11c). Recall first that our directional sentence (10a) is superficially similar to (11c), with la corresponding to dia and o to viẹ . If a parallel grammatical structure for (10a) is assumed, then there is reason to anticipate that corresponding to (11a) and (11b) there is (12a) and (12b).

(12) a. ọli ọmọhe la vbi oa
         the man   ran at house

         'the man ran into the house'

   b. ọli ọmọhe o   vbi oa
       the man   enter at   house

       'the man entered the house'

    c. *ọli ọmọhe la vbi oa   o   vbi oa
        the man   run at house enter at house

        'the man ran in the house and entered the house'

    d. *ọli ọmọhe la vbi oa   o
        the man   run at house enter

        'the man ran at the house and entered'

    e. *ọli ọmọhe la vbi oa   o   vbi ọ
        the man   run at house enter at it

        'the man ran at the house and entered it'

Following this lead, it might also be expected that a more explicit con-
joined structure along the lines of (12c) would occur. However, (12c) is un-
grammatical. Countering this, it may be that its ungrammaticality is due to
redundancy caused by the twin occurrence of vbi oa and that deletion of one
of the Locative complements through a process of conjunction reduction would
remedy the situation. As suggested by (11d), one might delete the complement
following the form o . There is, however, no corresponding sentence from the
motion domain, since in (12d) the o constituent cannot occur in a postcomple-
ment position.

On the other hand, the supposed redundancy of (12c) might be remedied by a
copy pronoun process along the lines of (11e). Unfortunately, the resulting
directional structure in (12e) is also ungrammatical, leading one to postulate
that in directional expressions la and o cannot accept identical comple-
ments. A final alternative, suggested by (11c), is to have conjunction reduc-
tion operate on the first of two identical Locative complements. But this,
too, ignores a principal semantic fact about (12c): it is a contradiction so
long as the two occurrences of oa exhibit identity of reference, for one can-
not first be running inside the house and then run into that same house.

Wishing to maintain the conjunction hypothesis, we might look to other
available conjoined structure types involving verbs of motion. In doing so
one encounters sentences like (13).

(13) a. ọli ọmọhe la vbi ẹvbo   o   vbi oa
         the man   run at village enter at house

         'the man ran in the village and entered the house'

  b. ọli ọmọhe la vbi ẹvbo   siọ o   vbi. oa
      the man   run at village crawl enter at   house

      'the man ran in the village and crawled into the house'

Sentence (13a) shows that la can accept a locative complement and still
precede o and its locative complement, and (13b) supports the possible disso-
ciation of la and o in the same sentence by placing siọ 'crawl' in collo-
cation with o . The crucial aspect of (13a) which argues that its underlying
form cannot be similar to that of the motion sentence (10a) is the nonidentity
of the locative complements. Assuming that identity of locative complements
would be a condition for the supposed conjunction reduction rule, there is no
basis for positing a conjoined structure for (10a) upon which this process
might act. A further argument against the conjoined clause hypothesis rests
with the placement of time adverbials. If individual clauses each containing
a locative complement underlie a directional sentence, then one would expect
each to allow adverbials of the type odẹ 'yesterday' or ẹẹna 'today'. For
instance, a conjoined structure with the verbs dẹ 'buy' and e 'eat', (14a),
can occur with odẹ and ẹẹna as in (14b) or odẹ alone as in (14c).

(14) a. ọli ọmọhe dẹ ema e   ọï
         the man   buy yam eat it

         'the man bought yam and ate it'

     b. ọli ọmọhe dẹ ema odẹ   e ọi ẹẹna
         the man   buy yam yesterday eat it today

         'the man bought yam yesterday and ate it today'

     c. ọli ọmọhe dẹ ema odẹ   e ọi
         the man   buy yam yesterday eat it

         'the man bought yam yesterday and ate it'

Attempts at constructing comparable motion sentences reveal that similar
adverbial placements do not occur. For example, (15a), where the adverbial
odẹ is attached to a hypothetical la clause and ẹẹna to a hypothetical
o clause, is ungrammatical. And as comparison of (15b) and (15c) suggests,
the unmarked position for a time adverbial is clause final position, arguing
that its placement is governed by a clause boundary. Since adverbials can not

occur between the forms la and o in a directional structure, a clause boun-
dary, and hence a dual clause structure, does not underlie (10a).

(15) a. *ọli ọmọhe la odẹ   o   vbi oa   ẹena
          the man   run yesterday enter at house today

          'the man ran yesterday and entered the house today'

    b. *ọli ọmọhe la odẹ   o   vbi oa
          the man   run yesterday enter at house

          'the man ran yesterday and entered the house'

    c. ọli ọmọhe la o vbi oa   odẹ
          the man   at house yesterday

          'the man ran into the house yesterday'

A further point of note is that adverbial intrusion is not allowed in as-
pectual structures which appear akin to what other investigators have called
"consecutives" [Hyman 1971, Welmers 1973]. The structures in question most
easily translate with 'and then' in English and reflect an aspectual distinc-
tion in which the internal time sequence of an event is prolonged. For in-
stance, the Inceptive Aspect (IA) marker ọ which can precede the leftmost
verb la , as in (16a), can also precede o , as in (16b), but it cannot occur
in both positions (16c). If one takes such an overtly consecutive structure
and examines it for adverbial intrusion, one still finds that two time adverb-
ials cannot occur, as (16d) attests. It seems reasonable to postulate that
the ungrammaticality of (16d) is due to the lack of a clause boundary attract-
ing each of the time adverbials and that (16e), likewise, is ungrammatical,
despite its explicit consecutive nature. It is only (16f), where the time ad-
verbial odẹ is in clause final position, that is grammatical.[11]

(16) a. ọli ọmọhe ọ la o vbi oa
          the man   IA   at house

          'the man went and ran into the house'

---

[11]Adverbials may also occur in clause initial position, but only as a fo-
cus constituent marked with the form li .

b. ọli ọmọhe la ọ o   vbi oa
    the man   run IA enter at house

    'the man ran and then entered the house'

c. *ọli ọmọhe ọ la ọ o   vbi oa
    the man   IA run IA enter at house

    'the man went and ran and then entered the house'

d. *ọli ọmọhe la odẹ   ọ o   vbi oa   ẹẹna
    the man   run yesterday IA enter at house today

    'the man ran yesterday and then entered the house today'

e. *ọli ọmọhe la odẹ   ọ o   vbi oa
    the man   run yesterday IA enter at house

    'the man ran yesterday and then entered the house'

f. ọli ọmọhe la ọ o   vbi oa   odẹ
    the man   run IA enter at house yesterday

    'the man ran and then entered the house yesterday'

The preceding examples suggest that the forms la and o existing in directional motion sentences cannot derive from an underlying dual clause structure, particularly one with two identical locative complements. In directionals, la must exist without a complement. Following up on this, it would be of interest to examine the distributional properties of la more fully so that a clearer perspective on its structural relationship with following constituents could be attained.

In pursuit of this goal one can ask whether la exhibits behavior similar to other intransitive verbs which occur with directional complements. For instance, the form viẹ seen earlier occurs in (17a), which is superficially similar to the motion structure (17c). Yet, only (17a) allows the paraphrase structure (17b), where the left to right order of viẹ and o is reversed, since (17d) with la and o similarly transposed is ungrammatical. One interpretation of this constraint is that la exists in a tighter structural relationship to the following MOTION+PATH constituent o than does viẹ .

(17) a. ọli ọmọhe viẹ o   vbi oa
        the man   cry enter at house

        'the man cried and entered the house'

    b.   ọli ọmọhe o   vbi oa   viẹ
        the man   enter at house cry

        'the man entered the house and cried'

    c.   ọli ọmọhe la o vbi oa
        the man   at house

        'the man ran into the house'

    d.   *ọli ọmọhe o   vbi oa   la
        the man   enter at house run

        'the man entered the house and ran'

The relatively more constrained behavior of form la is not absolute. It can occur in post-complement position, that is, to the right of the MOTION+PATH constituent o , but only when it is followed by a directional verb and its complement or a nondirectional complement, as in (18a) and (18b), respectively.

(18) a.   ọli ọmọhe o   vbi oa   la ye   aza
        the man   enter at house run move-toward inner room

        'the man entered the house and ran toward the inner room'

    b.   ọli ọmọhe o   vbi oa   la vbi aza
        the man   enter at house run at inner room

        'the man entered the house and ran in the inner room'

Thus, if la does occur to the right of the o complement, it also must take a complement, and, as shown earlier, the two complements cannot be identical. This holds for instances of the consecutive construction as well, e.g. (19a) relative to (19b) and (19c).

(19) a.   *ọli ọmọhe o   vbi oa   ọ la
        the man   enter at house IA run

        'the man entered the house and then ran'

    b.   ọli ọmọhe o   vbi oa   ọ la ye   aza
        the man   enter at house IA run move-toward inner room

        'the man entered the house and then ran toward the inner room'

    c.   ọli ọmọhe o   vbi oa   ọ la vbi aza
        the man   enter at house IA run at inner room

        'the man entered the house and then ran in the inner room'

Restating our point, it is not that la cannot accept locative complements,
only that it does not do so when it precedes a MOTION+PATH verb in a direction-
al motion clause.

Constraints on the distribution of the form la in directional structures
become more evident when its behavior in nondirectional sentences is consid-
ered. In non-directionals an isolated la can assume a post-complement posi-
tion. A comparison of the paraphrases (20a) and (20b), both of which are non-
directional, will show this to be the case.

(20) a.   ọli ọmọhe la   vbi ọli ọa
           the man   run at the house

           'the man ran in the house'

     b.   ọli ọmọhe za   vbi ọli ọa   la
           the man   be-located at the house running

           'the man ran in the house'

     c.   *ọli ọmọhe za   vbi ọli ọa
           the man   be-located at the house

           'the man was at the house'

     d.   *uzami   li ọli ọmọhe za   vbi ọa   la
           being located F the man   be-located at house run

           'being located is how the man ran in the house'

     e.   *ọli ọmọhe za   la vbi ọa
           the man   be-located run at house

           'the man ran in the house'

     f.   ebe   ọli ọmọhe za   la
           where the man   be-located run

           'where did the man run?'

     g.   *ebe   ọli ọmọhe la
           where the man   run

           'where did the man run?'

     h.   ọli ọa   li ọli ọmọhe za   la
           the house F the man   be-located run

           'it was the house that the man ran in'

i. *ọli oa   li ọli ọmọhe la
    the house F the man   run

    'it was the house that the man ran in'

The form la in nondirectional structures can thus occur in either pre-
or post-complement position. In the latter instance the form za , having the
meaning 'be-located', occurs in initial verb position, attracting tonal dis-
tinctions of the tense/aspect system and immediately following sentence nega-
tion or auxiliary constituents. An interesting property of za is its fail-
ure to occur as a main verb in a MANNERless simplex sentence, like (20c), and
its failure to undergo verb focusing, as in (20d). Furthermore it is not only
sentences like (20b) which require the presence of za and result in the post-
complement positioning of la . In nondirectional constructions where the loc-
tive constituent is questioned or focused, za is obligatory: the Wh-Question
corresponding to (20a) must take the form (20f), not (20g), and similarly, the
contrastive focus structure corresponding to (20a) must be (20h), not (20i).

Important for the present investigation is the fact that za never appears
in directional sentences. Using (21a) as a base, za occurs in neither its
Wh-Question counterpart, compare (21b) and (21c), nor its contrastive focus
version, compare (21d) and (21e). Similarly, a paraphrase along the lines of
(21f) cannot occur.

(21) a.   ọli ọmọhe la o vbi oa
           the man   at   house

           'the man ran into the house'

    b. *ebe   ọli ọmọhe za   la o
           where the man   be-located

           'where did the man run into?'

    c.   ebe   ọli ọmọhe la o
           where the man

           'where did the man run into?'

    d. *ọli oa   li ọli ọmọhe za   la o
           the house F the man   be-located

           'it was the house that the man ran into'

e. ọli oa   li ọli ọmọhe la o
    the house F the man

    'it was the house that the man ran into'

f. *ọli ọmọhe za   vbi oa   la o
    the man   be-located at house

    'the man was at the house running into'

From the facts in (20) and (21) it is evident that constraints on the dis-
tribution of la in directional and nondirectional expressions vary. What ap-
pears to underlie these constraints is a difference in lexicalization pattern.
In the instance of nondirectional motion, la may either incorporate the posi-
tional element BE-L in a MOTION+MANNER fashion, or it may retain a more analyt-
ic, nonincorporated structure, with both the MOTION(BE-L) and MANNER component
manifested separately at the surface level, i.e. za...la . By way of con-
trast, the distribution of la in directional structures is more constrained
and as suggested in the next section does not allow incorporation with any oth-
er semantic component.

2.3. Hypothesis III. The last hypothesis to be considered, alluded to
throughout the preceding, attempts to do justice to the grammatical facts cit-
ed against the previous two hypotheses. Schematically this third hypothesis
is presented below.

        la   o
        'by running'   'move into'
        MANNER   MOTION+PATH

It postulates that la in a directional structure specifies only MANNER,
lacking the MOTION element posited for the synthetic la of nondirectional
sentences. With the assumed incorporation of MOTION+PATH in o , there is the
ability to account for its behavior as a verb in MANNER expressions and, by
extension, in MANNERless sentences. Under this third hypothesis both la and
o would also be members of the same syntactic class, verb, since they act sim-
ilarly with respect to the different grammatical processes illustrated earlier.
Moreover, constraints on the positioning of locative complements and adverb-
ials between these two forms suggest that a phrase rather than a clause bound-

ary lies at their juncture.

If correct, this lexicalization pattern places Emai directional expres-
sions in the typological set of Romance languages like Spanish, as well as Sa-
moan and Semitic. A principal difference between these languages and Emai re-
mains, however, in that the MANNER constituent is realized by a verb positioned
to the left of the MOTION+PATH verb. In fact, closer scrutiny of Talmy's typo-
logy shows that the positioning of a MANNER constituent to the left of a
MOTION+PATH verb does occur in other languages. For example, Nez Perce, a pol-
ysynthetic Amerindian language of the Northwest Coast, employs such a pattern,
as in (21) below, where the MANNER constituent -ququ- is positioned to the
left of the MOTION+PATH verb -láhsa- . But in contrast to the Emai pattern,
-ququ- itself is a prefix, not a verb.

(21) hi-   ququ-   láhsa-e   'he galloped uphill'
      3rd person-galloping-go up-past

It is therefore Emai's use of a verb to mark MANNER that distinguishes it
from other languages in Talmy's MOTION+PATH class. To the extent that a simi-
lar pattern is evident in other Kwa langauges, one might be able to specify
the characteristics of this subtype and make fruitful comparisons with lan-
guages like Nez Perce. Lastly, the typological results of the present study
align well with those uncovered for Tswana, a Southeastern Bantu language
[Schaefer 1985], and suggest thereby that analysis of the motion field may
lead to greater insight into the lexicalization patterns characteristic of Ni-
ger-Congo languages.

3. <u>Summary</u>

In the preceding, a small segment of the motion domain in Emai was ana-
lyzed in the theoretical framework of Talmy [1972, 1975, 1985]. Both direc-
tional and nondirectional structures conveying the MANNER in which a motion
event occurs were investigated, though special emphasis was placed on the se-
mantic composition of verb forms in directional expressions. Three hypotheses
derived from the Talmy model were advanced and evaluated in terms of distribu-
tional constraints governing verbs in serial and nonserial constructions. On
the basis of these constraints it was argued that directional and nondirection-

al expressions are characterized by different patterns of lexicalization. For directional structures, verbs in continuous series incorporate MANNER and MO-TION+PATH. For nondirectional structures either a single verb incorporates MOTION+MANNER, or that verb in discontinuous series with another lexicalizes MOTION followed by MANNER.

REFERENCES

Awobuluyi, A. O. 1973. "The modifying serial construction (a critique)." *Studies in African Linguistics* 4:87-111.

Bamgbose, A. 1973. "The modifying serial construction." *Studies in African Linguistics* 4:207-218.

Bamgbose, A. 1974. "On serial verbs and verbal status." *Journal of West African Languages* 9:17-48.

Edo Language and its Orthography: Report of the Seminar on Edo Orthography, 15-18 May, 1974. Benin City: Ministry of Education.

Hansford, K., J. Bendor-Samuel and R. Stanford. 1976. *Studies in Nigerian Languages: An Index of Nigerian Languages*. Accra: Summer Institute of Linguistics.

Hyman, L. 1971. "Consecutivization in Fe'fe'." *Journal of African Languages* 10(2):29-43.

Langacker, R. W. 1982. "Space grammar, analysability, and the English passive." *Language* 58:22-80.

Langacker, R. W. 1985. "A view of linguistic semantics." Invited address at Mid-America Linguistics Conference, Kansas State University.

Schaefer, R. P. 1985. "Motion in Tswana and its characteristic lexicalization." *Studies in African Linguistics* 16:57-88.

Schaefer, R. P. n.d. "Suggestions for an Emai orthography." Manuscript prepared for Ministry of Education, Owan Local Government Area, Bendel State, Nigeria.

Talmy, L. 1972. "Semantic structures in English and Atsugewi." Unpublished PhD dissertation, University of California, Berkeley.

Talmy, L. 1975. "Semantics and syntax of motion." In J. Kimball (ed.), *Syntax and Semantics*, Volume 4, pp. 181-238. New York: Academic Press.

Talmy L. 1985. "Lexicalization patterns: semantic structure in lexical forms." In T. Shopen (ed.), *Language Typology and Syntactic Field Work*, Volume III, pp. 57-149. New York: Cambridge University Press.

Welmers, W. 1973. *African Language Structures*. University of California Press: Berkeley.

COMPARISON IN BAMBARA: AN INFINITIVAL VERB PHRASE*

Jan Charles-Luce
Indiana University

An infinitival verb phrase is generated to express compar-
ison in Bambara. In particular, the comparative verb
phrase has the structure: INFINITIVE MARKER + INTRANSITIVE
VERB + NP + POSTPOSITION. The structural constraints on
the comparative verb phrase are not specific to comparison,
but are the more general constraints resulting from concat-
enating verb phrases. However, a special structural and
pragmatic relation is established between the head clause
and the comparative infinitival verb phrase. This relation
has consequences for the structure of the NP in the compar-
ative phrase and for deletion of lexical items within the
comparative phrase. In this respect, the comparative in-
finitival phrase behaves differently from non-comparative
infinitival verb phrases.

1. Introduction

    To express comparison in English, a specific syntactic structure is gener-
ated. (1) and (2) are examples of the comparative construction in English.

(1) Betty is taller than Kent [is tall].

(2) Paul has more cats than [he has] dogs.

In general, every comparative construction in English consists of a head
clause, a COMP that marks the comparative clause, and a comparative clause
(see Greenberg [1963]; Andersen [1982]; Pinkham [1982]; Bresnan [1972, 1973,

1975, 1977]; Chomsky [1977]; Napoli [1983] for more complete discussions of English comparatives). The head clause of the comparative construction precedes the COMP (*than*, *as*). The comparative clause follows the COMP and must lexically contrast in some way with the head. Thus, the comparative clause contains some lexical items that are non-identical with some lexical items in the head, as well as lexical items that are identical with the head (as indicated by the brackets in (1) and (2)). The non-identical lexical items are the focus of the comparison.

Expressing a comparison in Bambara, a dialect of Mande, a Niger-Congo language, is not unlike that of many other African languages, e.g. Yoruba, Ewe, Shona, Igbo, among others, in which a verb with the general interpretation of 'surpass' is used (cf. Welmers [1974]). More specifically, the verb phrase generated to express comparison in Bambara is syntactically similar to other infinitival verb phrases in this language. Consequently, the structural constraints on the comparative expression are not specific to comparison, but are the more general constraints resulting from concatenating verb phrases. The following description of Bambara comparatives shows that the comparative infinitival verb phrase is constrained by these general structural properties. However, in some kinds of comparisons, the comparative verb phrase does behave differently from other infinitival phrases, arising from its unique purpose of expressing a comparison.

2. General Properties of Infinitival Verb Phrases

Infinitival verb phrases can be either intransitive or transitive, regardless of the head verb phrase. The infinitival phrase that expresses comparison in Bambara is structurally similar to other intransitive infinitival phrases. For example, compare the following:

(3) Fanta ka bòn kà tɛ̀mɛ̀n Umu kàn[1]   'Fanta is bigger than Umu is'
     Fanta is big and surpass Umu over

---

[1]Bambara words are either high or low in tone. In the present paper, low toned words are marked with a grave accent (ˋ). High toned words are not marked. In addition, the definite article is represented by a low tone follow-

(4) Musa bɛ wuli kà ʈaa sugu` la
     Musa PRES get up and goes market to

     'Musa gets up and goes to the market'

In (3), the infinitival verb phrase is kà ʈɛ̀mɛ̀n Umu kàn and expresses compar-
ison. In (4), the infinitival verb phrase is kà ʈaa sugu` la , but it does
not express comparison. Nonetheless, the structure of both infinitival phrases
is INFINITIVE MARKER + INTRANSITIVE VERB + NP + POSTPOSITION.

   The structure is only slightly different for infinitival verb phrases hav-
ing transitive verbs. In (5), the infinitival verb phrase kà kini sàn sugu`
la has the structure INFINITIVE MARKER + NP + TRANSITIVE VERB + NP + POST-
POSITION.

(5) Musa bɛ sàgàw fèerè kà kini sàn sugu` la
     Musa PRES sheep sell and rice buy market at

     'Musa sells sheep and buys rice at the market'

   Two fundamental points demonstrate that the comparative infinitival verb
phrase is structurally similar to other infinitival phrases. These points re-
fer to (1) the tense and (2) the (non-)negation of infinitival verb phrases.

   The head verb phrase in a given series of verb phrases is assigned tense
and thereby governs the tense of all coordinate verb phrases. The infinitival
marker kà is not inflected for either present or past tense in (6) or (7),
respectively.

(6) Musa bɛ dɔgɔ` ʈìgɛ̀ k' à fèerè Ali la
     Musa PRES wood cut and it sell Ali to

     'Musa cuts firewood and sells it to Ali'

(7) Musa ye dɔgɔ` ʈìgɛ̀ k' à fèerè Ali la
     Musa PAST wood cut and it sell Ali to

     'Musa cut firewood and sold it to Ali'

The same is also true for the infinitival verb phrase that expresses comparison,
namely, kà ʈɛ̀mɛ̀n Y kàn . The head verb phrase governs the tense of the whole

_____

ing a specific noun and any modifiers. The plural marker -w also takes the
definite low tone if the preceding noun is specific.

comparison.

(8) Musa bɛ   dɔgɔˋ tìgɛ̀ kà tɛ̀mɛ̀n Ali kàn
     Musa PRES wood   cut and surpass Ali over

     'Musa cuts more firewood than Ali does'

(9) Musa ye   dɔgɔˋ tìgɛ̀ kà tɛ̀mɛ̀n. Ali kàn
     Musa PAST wood   cut and surpass Ali over

     'Musa cut more firewood than Ali did'

A second point demonstrating the structural similarity between the compara-
tive infinitival phrase and other infinitival phrases involves negation. The
head verb phrase also governs the scope of negation for all coordinate verb
phrases. Compare the meanings between the (a) and (b) examples in the follow-
ing non-comparative sentences.

(10) a. Musa ma   sàgàẁ fèerè kà baẁ sàn
         Musa PAST-NEG sheep sell and goats buy

         'Musa did not sell sheep and [did not] buy goats'

     b. Musa ye   sàgàẁ fèerè nkà à ma   baẁ sàn
         Musa PAST-AFF sheep sell but he PAST-NEG goats buy

         'Musa sold sheep but he did not buy goats'

(11) a. Fanta tɛ   wuli kà taa sugùˋ la
         Fanta PRES-NEG get up and go market to

         'Fanta does not get up and [does not] go to the market'

     b. Fanta bɛ   wuli nkà à tɛ   taa sugùˋ la
         Fanta PRES-AFF get up but she PRES-NEG go market to

         'Fanta gets up but she does not go to the market'

In the (a) examples, the scope of negation is the whole sentence. Thus, when
the head verb is negated, all verb phrases in the sentence are interpreted as
negated. If only the infinitival verb phrase is negated, as in the (b) exam-
ples, the result is no longer a series of verb phrases but rather a series of
sentences. In this case, the subject of the second sentence is phonetically
realized as the pronominal form of the subject of the head sentence and the
tense marker is negated in the second sentence. The contrastive sentences are

conjoined by the coordinate conjunction   nkà   'but'.

   Examples (12a-b) show the comparative verb phrase. Essentially, the same
principles apply to   kà tɛ̀mɛ̀n. Again, (12b) shows that negation of only the
infinitival comparative phrase results in a series of sentences rather than a
series of verb phrases.

(12) a. Musa tɛ sàgàw fèerè kà tɛ̀mɛ̀n. Ali kàn.
         Musa not sheep sell and surpass Ali over

         'Musa does not sell more sheep than Ali'

     b. Musa bɛ   sàgàw fèerè nkà à· tɛ tɛ̀mɛ̀n   Ali kàn
         Musa PRES sheep sell but he not surpass Ali over

         'Musa sells sheep but he does not surpass Ali'

Infinitival verb phrases, whether or not they express comparison, cannot be
negated if their head verb phrase is in the affirmative.

3. Structure of the Comparative Infinitival Verb Phrase

   The comparative verb phrase in Bambara, then, is not a unique structure
generated to express comparison. Rather, it is an infinitival verb phrase
with many structural properties similar to other infinitival phrases. The
"comparative" verb phrase in Bambara contains the infinitival verb form kà
tɛ̀mɛ̀n 'and surpass' and a postpositional phrase Y kàn 'Y over'.[2] Y repre-
sents the lexical item in the   kà tɛ̀mɛ̀n Y kàn   verb phrase that is compared to
some lexical item, X, in the head clause. Thus, X and Y are the focus of the
comparison.

----

   [2]It is also possible to express a comparison with the complex postposition-
al phrase ni Y ye , which can loosely be translated as 'in-relation-to' [Bird
and Kante 1976; Bird et al. 1977]. For example,

(i) Fanta ka jàn (ni) Umu ye   'Fanta is taller than Umu'
     Fanta is tall (and) Umu in-relation-to

Although the postpositional phrase can often be used interchangeably with the
infinitival verb phrase to express comparison, a subtle semantic difference
may exist for some Bambara speakers. The postpositional phrase may specify
that the comparison is less obvious, whereas the infinitival phrase may speci-
fy that the comparison is more observable. In the present study of comparison,
only the infinitival verb phrase will be discussed.

(13) Fanta bɛ kini˙ sàn kà tɛ̀mɛ̀n nyɔ˙ kàn
      Fanta PRES rice buy and surpass millet over

      'Fanta buys more rice than millet'

(14) Musa ka jàn kà tɛ̀mɛ̀n Ali kàn.
      Musa is tall and surpass Ali over

      'Musa is taller than Ali is'

In both sentences, the comparative verb phrase consists of the infinitive mark-
er kà and the verb tɛ̀mɛ̀n 'surpass', the object of comparison, and the post-
position kàn 'over'.[3] In (13), nyɔ˙ 'millet' is the lexical item in the
comparative verb phrase that is being compared to kini 'rice' in the head
clause. In (14), Ali is the lexical item in the comparative verb phrase
that is being compared to Musa in the head clause.

    As is already obvious, the structure of the comparative verb phrase allows
for only NPs to be compared. That is, for some X in the head clause and some
Y in the kà tɛ̀mɛ̀n Y kàn comparative verb phrase, X and Y must be NPs. Struc-
turally, Y must be an NP because it is the object of the postposition kàn
'over'. Observe in the following examples that verbs and adjectives that ex-
press physical sensations are nominalized.

(15) Umu ka bòlì˙ ka telin kà tɛ̀mɛ̀n panni˙ kàn
      Umu her running is fast and surpass trotting over

      'Umu runs faster than she jogs'

(16) sùnɔ̀gɔ̀˙ bɛ Umu la kà tɛ̀mɛ̀n kɔngɔ˙ kàn
      sleep is Umu on and surpass hunger over

      'Umu is more sleepy than hungry'

---

[3]There is some disagreement as to whether the head verb phrase in (14) is
a verbal construction, as I have described it, or whether it is a non-verbal
construction [Charles Bird, personal communication]. If it is a non-verbal
construction, then the infinitival verb phrase that expresses comparison is
conjoined to either a verb phrase, as in (13), or to an adjective phrase, as
in (14). According to the non-verbal argument, the comparative infinitival
verb phrase is peculiar because all other infinitival verb phrases are con-
joined only to verb phrases. Nonetheless, the similarities between the syn-
tactic structure of the comparative and the non-comparative infinitival verb
phrases remain.

3.1. The structure of the compared NP. The Y, or object of comparison in the kà tɛ̀mɛ̀n Y kàn comparative verb phrase, can be either a non-possessive NP, as has been illustrated in the previous examples, or it can be a possessive NP whose structure expresses possession. The use of the non-possessive versus the possessive NP is dependent upon whether the head clause expresses possession. Thus, the structure of the head clause determines the structure of the NP in the comparative verb phrase.

Possessive NPs are illustrated in (17) and (18). The sentences in (17) may be referred to as "locative-possessive comparisons" and those in (18) as "possessor-possessed comparisons". In the head clause of (17), bɛ...fɛ̀ is a locative construction expressing possession. In this construction, bɛ denotes existence, location, or state. The postposition fɛ̀ acts relationally to locate objects and, in the possessive sense, can be translated as 'with'. The possessive comparisons in (18) are termed "possessor-possessed" because the head noun phrase has the structure NOUN + POSSESSIVE MARKER + NOUN, where ka is the possessive marker.[4] Thus, possession can be expressed in the head clause by either a noun phrase or a locative construction.

(17) Locative-Possessive Comparisons:

    a. baẁ   caman bɛ Ali fɛ̀   kà tɛ̀mɛ̀n Musa ka sàgàẁ kàn
        goats many are Ali with and surpass Musa his sheep over

        'Ali has more goats than Musa has sheep'

    b. baẁ   caman bɛ Ali fɛ̀   kà tɛ̀mɛ̀n Musa taẁ   kàn
        goats many are Ali with and surpass Musa his (goats) over

        'Ali has more goats than Musa has'

(18) Possessor-Possessed Comparisons:

    a. Ali ka baẁ ka ca kà tɛ̀mɛ̀n Musa ka baẁ   kàn
        Ali his goats are many and surpass Musa his goats over

        'Ali has more goats than Musa has'

---

[4]The possessive marker ka is inserted only when the possessed item is alienable from the possessor [Bird et al. 1977]. That is, the possessed object is neither physically nor familially a part of the possessor. Conversely, inalienable possession signifies that the object is physically or familially a part of the possessor and ka is not inserted.

b. Ali ka baw̌   ka ca   kà tɛ̀mɛ̀n Musa taw̌   kàn
    Ali his goats are many and surpass Musa his (goats) over

    'Ali has more goats than Musa has'

Thus, regardless of how possession is expressed in the head clause of (17)
and (18), the compared items in the comparative verb phrase of both (17) and
(18) are possessive NPs. In (17a) and (18a), the possessive NPs in the compar-
ative phrases have the structure NOUN + POSSESSIVE MARKER (ka) + NOUN. In
(17b) and (18b), the possessive NPs have the structure NOUN + POSSESSIVE PRO-
NOUN (taw̌ 'his').

The examples in (19a-d) are non-possessive comparatives because possession
is *not* expressed in the head clause. Consequently, non-possessive comparisons
do not generate possessive NPs as the compared item in the comparative verb
phrase.

(19) <u>Non-possessive Comparisons</u>:

    a. ù   bɛ   poponiw   belebele' dìlà kà tɛ̀mɛ̀n nɛ̀gɛ̀sòw̌ kàn
        they PRES motorbikes big   make and surpass bicycles over

        'they make bigger motorbikes than they make bicycles'

    b. Mamadou ye   dɔgɔ' caman tà   kà tɛ̀mɛ̀n ji' kàn
        Mamadou PAST wood   much carry and surpass water over

        'Mamadou carried more firewood than water'

    c. Musa bɛ   dumuni nyuman' dìlà kà tɛ̀mɛ̀n Fanta kàn
        Musa PRES food   good   make and surpass Fanta over

        'Musa makes better food than Fanta does'

    d. Musa bɛ   dumuni nyuman' dìlà kà tɛ̀mɛ̀n mìnfɛnw̌ kàn
        Musa PRES food   good   make and surpass drinks over

        'Musa makes better food than he makes drinks'

The non-possessive comparison in (20) is ungrammatical because of the pos-
sessive NP in the comparative phrase. To express the same idea, the contrast-
ive coordinated sentence in (21) is generated instead.

(20) *Musa bɛ   dumuni nyuman' dìlà kà tɛ̀mɛ̀n Fanta ka mìnfɛnw̌ kàn
       Musa PRES food   good   make and surpass Fanta her drinks over

(21) Musa bɛ dumuni nyuman` dìlà nkà Fanta tɛ mìnfɛnẁ nyuman` dìlà
     Musa PRES food good make but Fanta not drinks good make

     'Musa makes good food but Fanta does not make good drinks'

The ungrammaticality of (20) demonstrates that unless the head clause expresses
possession, a possessive NP in the comparative infinitival verb phrase results
in a comparison that is unacceptable to Bambara speakers.

It is interesting to observe that this kind of relation between the head
clause and the comparative infinitival verb phrase does not constrain non-com-
parative infinitival verb phrases. The following sentences illustrate that pos-
sessive NPs can occur in non-comparative infinitival verb phrases without the
head clause expressing possession. The non-comparative phrase is interpreted
independently of the head clause, with the exception that the subject of the
head clause is understood as the subject of the infinitival phrase.

(22) Fanta bɛ mangoroẁ fèerè kà Sali ka bagi` tìgè
     Fanta PRES mangoes sell and Sali her cloth buy

     'Fanta sells mangoes and buys Sali's cloth'

(23) Fanta dònnà kungo` kɔnɔ k' à  den` nyini
     Fanta entered woods into to her child look for

     'Fanta entered the woods to look for her child'

It appears, then, that because the NP in the comparative verb phrase is
structurally contingent upon the structure of the head clause, a functional re-
lation holds between the head clause and the NP of the comparative infinitival
phrase. Moreover, a pragmatic relation also holds because the head clause es-
tablishes the context for interpreting the comparative phrase and, therefore,
the whole comparison. The same structural and pragmatic relation, however, is
not established between head clauses and non-comparative infinitival phrases.
The meaning of non-comparative infinitival phrases is independent of the mean-
ing of their head clauses.

These facts suggest that whereas the comparative infinitival phrase is
structurally similar to other infinitival phrases, it does have the unique func-
tion of expressing a comparison. Together, the pragmatic and structural rela-
tion between the head clause and the comparative verb phrase has consequences

for the NPs in the comparative phrase.

3.2. <u>Optional deletion of identical NPs</u>. The possessive NP in the comparative
verb phrase of possessive comparisons can undergo optional deletion without
changing the intended meaning of the comparison. However, this is true if and
only if the deleted noun (or pronoun) in the comparative phrase is identical
with a noun in the head clause. Examples (24a) and (25a) illustrate the com-
parative phrases before deletion, and (24b) and (25b) illustrate the same
phrases after deletion has applied.

(24) a.   baẁ   caman bɛ Ali fɛ̀   kà tɛ̀mɛ̀n   Musa ka baẁ   kàn
          goats many are Ali with and surpass Musa his goats over
          'Ali has more goats than Musa has'

     b.   baẁ   caman bɛ Ali fɛ̀   kà tɛ̀mɛ̀n   Musa kàn
          goats many are Ali with and surpass Musa over
          'Ali has more goats than Musa has'

(25) a.   Ali ka baẁ   ka ca   kà tɛ̀mɛ̀n   à ka sàgàẁ kàn
          Ali his goats are many and surpass he his sheep over
          'Ali has more goats than sheep'

     b.   Ali ka baẁ   ka ca   kà tɛ̀mɛ̀n   sàgàẁ kàn
          Ali his goats are many and surpass sheep over
          'Ali has more goats than sheep'

Deletion does not disrupt the pragmatic or structural relation between the com-
parative phrase and head clause. The recoverability of the deleted items al-
lows for the recoverability of their function within the comparative phrase.
As a result, the comparison will be correctly interpreted.

     Deletion of non-identical nouns obviously results in a change of meaning.
This is shown when deletion applies to the comparative phrase in (26). Nei-
ther (27) nor (28) mean the same as (26) because their base-structures are not
(26).

(26)   Ali ka baẁ   ka ca   kà tɛ̀mɛ̀n   Musa ka sàgàẁ kàn
          Ali his goats are many and surpass Musa his sheep over
          'Ali has more goats than Musa has sheep'

(27) Ali ka baw̌ ka ca kà tɛ̀mɛ̀n sàgàw̌ kàn
     Ali his goats are many and surpass sheep over

    'Ali has more goats than sheep'

(28) Ali ka baw̌ ka ca kà tɛ̀mɛ̀n Musa kàn
     Ali his goats are many and surpass Musa over

    'Ali has more goats than Musa has'

In (26), the comparison is between the number of goats Ali has and the number
of sheep Musa has. If deletion applies and deletes Musa ka as in (27), the
meaning becomes 'the number of goats Ali has is more than the number of sheep
he [Ali] has'. The base-structure for (27) is (25a) above. Furthermore, if
deletion applies and deletes ka sàgàw̌ as in (28), the meaning becomes 'the
number of goats Ali has is more than the number of goats Musa has'. The pos-
sessive pronoun taw̌ 'his' can be inserted optionally in the comparative
phrase to communicate this meaning more explicitly, i.e., ... kà tɛ̀mɛ̀n Musa
taw̌ kàn . Taw̌ indicates that Musa owns goats and not sheep because its refer-
ent is 'goats' in the head clause. The base-structure for (28) is (18a) above.

    Likewise, optional deletion is not possible in other non-possessive, non-
comparative infinitival verb phrases without changing the intended meaning.

(29) Ali dònnà kungo` kɔnɔ kà Musa ka mìsìw̌ nyini
     Ali entered woods into to Musa his cows look for

    'Ali entered the woods·to look for Musa's cows'

(30) Ali dònnà kungo` kɔnɔ kà mìsìw̌ nyini
     Ali entered woods into to cows look for

    'Ali entered the woods to look for the cows'

Example (29) means that Ali is looking only for Musa's cows, whereas (30) means
that Ali is looking for some cows, but the cows are not (necessarily) Musa's;
they may be Ali's, Musa's, or someone else's cows. Thus, the deletion of
Musa ka may result in structural ambiguity. Although context may help to dis-
ambiguate the meaning of (30), there is no ambiguity in (31). In this case,
only Musa is inserted in the base-structure. The NP in the underlying com-
parative phrase is not possessive.

(31) Ali dònnà   kungo` kɔnɔ kà Musa nyini
      Ali entered woods   into to Musa look for

      'Ali entered the woods to look for Musa'

Optional deletion is unique to the possessive comparatives. Possessive NPs
in the comparative verb phrases are generated to maintain a structural and
pragmatic relation between the comparative phrase and head clause. Possessive
NPs may or may not contain some lexical items that are identical in the compar-
ative phrase and head clause. However, deletion of items is optional in the
comparative phrase if and only if a noun in the comparative verb phrase is
identical to some noun in the head clause, and the head clause expresses pos-
session.

4. Summary

The present paper has attempted to show that the construction generated to
express comparison in Bambara is an infinitival verb phrase with the same ba-
sic syntactic properties as other infinitival verb phrases that do not express
comparison. First, the basic structure of the comparative verb phrase is:
INFINITIVE MARKER + INTRANSITIVE VERB + NP + POSTPOSITION. This structure is
the same as any other infinitival intransitive verb followed by a postposition-
al phrase. Second, kà cannot be marked for tense or negation without result-
ing in a series of sentences rather than a series of verb phrases.

With respect to the details of the comparative infinitival phrase, it was
shown that the compared items must be NPs. This is a direct consequence of
the structure of the postpositional phrase in the comparative verb phrase.
Furthermore, the structure of the NP in the comparative phrase is contingent
upon the head clause. If the head clause expresses possession, then a posses-
sive NP is generated in the comparative verb phrase. Conversely, if the head
clause does not express possession, then the NP in the comparative phrase can-
not express possession, and a non-possessive NP is generated in the base-struc-
ture. Thus, a structural relation is maintained between the head clause and
comparative phrase. Moreover, the comparative verb phrase, unlike other non-
comparative infinitival verb phrases, is contextually dependent upon the head

clause for its meaning. The head clause establishes the context for interpreting the comparative phrase and, hence, for interpreting the whole comparison.

Finally, as a result of the special structural and pragmatic relation between the head clause and the comparative phrase, optional deletion may occur in the comparative phrases of possessive comparatives, but if and only if the deleted noun in the comparative verb phrase is lexically identical with some noun in the head clause. This ensures maximal recoverability of the structural and pragmatic function of the deleted items, thus maintaining the correct interpretation for the whole comparison.

REFERENCES

Andersen, P.K. 1982. "On universal 22." *Journal of Linguistics* 2:231-243.

Bird, Charles and Mamadou Kante. 1976. *Intermediate Bambara*. Bloomington, Ind.: Indiana University Linguistics Club.

Bird, Charles, John Hutchison and Mamadou Kante. 1977. *Introductory Bambara*. Bloomington, Ind.: Indiana University Linguistics Club.

Bresnan, Joan W. 1972. "Theory of complementation in English syntax." PhD dissertation, Massachusetts Institute of Technology. [Reprinted by Garland Publishing, Inc., 1979.]

Bresnan, Joan W. 1973. "Syntax of the comparative clause construction in English." *Linguistic Inquiry* 4:275-343.

Bresnan, Joan W. 1975. "Comparative deletion and constraints on transformations." *Linguistic Analysis* 1:25-76.

Bresnan, Joan W. 1977. "Variables in the theory of transformation." In Peter W. Culicover, Thomas Wasow and Adrian Akmajian (eds.), *Formal Syntax*, pp. 157-196. New York: Academic Press.

Chomsky, Noam. 1977. "On WH-movement." In Peter W. Culicover, Thomas Wasow and Adrian Akmajian (eds.), *Formal Syntax*, pp. 71-132. New York: Academic Press.

Greenberg, Joseph H. 1963. "Some universals of grammar with particular reference to the order of meaningful elements." In Joseph H. Greenberg (ed.), *Universals of Langauge*, pp. 73-113. Cambridge, Mass.: MIT Press.

Napoli, Donna Jo. 1983. "Comparative ellipsis: a phrase structure analysis." *Linguistic Inquiry* 14:675-694.

Pinkham, Jessie E. 1982. "The formation of comparative clauses in French and English." PhD dissertation, Indiana University. [Reproduced by Indiana University Linguistics Club.]

Welmers, William E. 1974. *African Language Structures*. Berkeley: University of California Press.

PUBLICATIONS RECEIVED

Herman Batibo. *Le kesukuma, langue bantu de Tanzanie: phonologie, morphologie*.
     Cahier no. 17.   Paris: Editions Recherche sur les Civilisations, 1985.
     A.D.P.F. 9, rue Anatole-de-la-Forge, 75017 Paris.   Pp. 340.   FF168,22.

     This is a detailed descriptive study of Kesukuma.   Following an introduc-
     tion giving location, classification, previous documentation, and sources
     for the present study, the descriptive chapters are as follows: Phonolo-
     gie, Morphophonologie, Derivation, Le Nominal, La Flexion Verbale, L'In-
     flexion, and Composition.   A concluding chapter points out some theoreti-
     cal considerations of the descriptive portions, pedagogical implications
     for teaching the language, and implications for Bantu history.   An appen-
     dix summarizes the "morphotonèmes de base" and the rules for tone reali-
     zation.   The entire text is fully tone-marked.

German de Granda Gutiérrez.   *Estudios de Lingüística Afro-Romanica*.   Lingüísti-
     ca y Filologia, no. 1.   Valladolid: Universidad de Vallodolid, Secreta-
     riado de Publicaciones, 1985.   Pp. 225.   no price listed.

     This is a collection of 13 papers, principally on the languages of Equa-
     torial Guinea.   The paper titles are as follows: I.   Perfil lingüístico
     de Guinea Ecuatorial; II.   Las lenguas de Guinea Ecuatorial. Materiales
     bibliográficos para su estudio; III.   Fenómenos de interferencia fonética
     del fang sobre el español de Guinea Ecuatorial.   Consonantismo; IV.   Un
     caso de transferencia léxica intercolonial.   Cuba-Fernando Poo (Bioko);
     V.   Portuguesismos léxicos en el bubi y el pidgin english de la isla de
     Bioko (Fernando Poo); VI.   Préstamos léxicos de aculturación en dos len-
     guas bantu de Guinea Ecuatorial; VII.   Sociolingüística de un microespa-
     cio criollo portugués de Africa (Annobón); VIII.   El "vocabulario funda-
     mental" del criollo portugués de Annobón.   Rasgos caracterizadores; IX.
     Expansión léxica en un campo semántico del criollo portugués de Annobón;
     X.   Procesos de aculturación léxica en el criollo portugués de Annobón;
     XI.   Las retenciones léxicas africanas en el criollo portugués de Annobón
     y sus implicaciones sociohistóricas; XII.   Préstamos léxicos del pidgin
     english en el criollo portugués de Annobón; XIII.   Notas sobre el fone-
     tismo del bubi de Moka.

Gideon Goldenberg (ed.).   *Ethiopian Studies: proceedings of the sixth inter-
     national conference, Tel-Aviv, 14-17 April 1980*.   Rotterdam & Boston: A.
     A. Balkema, Postbus 1675, NL-3000 BR Rotterdam, The Netherlands, 1986.
     Pp. xiv, 530. $54.00 US.

     This volume contains 31 papers presented at the Sixth International Con-
     ference of Ethiopian Studies, held in Tel-Aviv in April 1980.   The papers

cover a variety of topics, including Semitic and Cushitic languages, lit-
erature, religion, history, modern politics, and social issues. The pa-
pers dealing specifically with languages are the following: D.L. Apple-
yard, "The radical extension system of the verb in Agaw"; A. Dolgopolsky,
"Semitic nomina segolata in Ethiopic"; Y. Gruntfest, "Some remarks on the
case system in Semitic languages:; R.J. Hayward, "Some observations on
Dirayta (Gidole) pronouns"; O. Kapeliuk, "Pseudo-questions in Amharic";
W. Leslau, "Cushitic loanwords in Gurage"; B. Podolsky, "The system of
verbal stems in Amharic"; S. Raz, "Vowel quantity in Tigre"; J. Tubiana,
"Modernisation et emprunts lexicaux en amharique"; R.M. Voigt, "A note
on SPA, or: A case for a new segment in Amharic"; and A. Zaborski, "Can
Omotic be reclassified as West Cushitic?".

Juliana Kuperus. *The Londo Word: its Phonological and Morphological Structure*.
Sciences Humaines, Vol. 119. Tervuren, Belgium: Musée Royal de l'Afrique
Centrale, 1985. Pp. xiv, 331. no price listed.

This is a descriptive study of Londo. A preface gives the author's opin-
ions on the relation of linguistic theory to language description and ac-
knowledgements, and an introduction presents background material on Londo,
a Bantu language (A.11) of Cameroon, as well as the author's theoretical
model, essentially a linear generative phonology. The descriptive chap-
ters are as follows: "Phonology", "Words which Command Concord: Nouns",
"Words which Undergo Concord", "Words which Do not Participate in the
Concord System", "Derivation and Compounding", and "Summary of Rules and
Conditions in General Order of Application". Following these chapters is
a 38 page Londo-English word list, and an English-Londo index to the word
list, a short text, and a bibliography.

Periodicals

Cahiers du LACITO, no. 1. Paris: LACITO-CNRS, 1986. Pp. 226. no subscription
price listed.

The first issue of a new journal which has as its goal "d'exprimer en un
lieu privilégié ses conceptions [les conceptions du LACITO] d'une disci-
pline récente au carrefour des domaines classiques de la linguistique, de
l'ethnologie et des sciences naturelles" (Avant-Propos, p. 7). This is-
sue contains the following 8 articles: Pascal Boyeldieu, "Présentation
sommaire du groupe boua (Tchad) (Adamawa 13 de J.H. Greenberg)"; Véro-
nique de Colombel, "Sociolinguistique et parenté linguistique: la notion
d'osmose (à partir du cas des langues tchadiques des Monts Mandara, dans
le nord du Cameroun)"; Christiane Paulian, "Les voyelles en nù.kàlɔ̀ŋɛ̀ :
sept phonèmes, mais ..."; K.J. Hollyman, "Les emprunts polynésiens dans
les langues de la Nouvelle-Calédonie et des Iles Loyauté"; Robert Damoi-
seau, "Un example d'action réciproque entre signifié et fonction en cré-
ole haïtien et en créole martiniquais"; Anne Fauchois, "Contenus de la
fonction prédicative et catégories lexicales en créole seychellois", J.J.

Smolicz, "Valeurs fondamentales et identité culturelle"; André-Marie Des-
pringré, "Langues des chants de fêtes des villes et villages du Westhoek
français". There is also a "Notes et Documents" section with the three
following contributions: Henry Tourneux, "Petit lexique créole haïtien
utilisé dans le domaine de l'électricité"; Maurice Coyaud, "Fêtes de
quartiers à Tokyo"; and Jean-Pierre Caprile et Irumu Agozia-Kario, "Docu-
ments sur la numération et les mesures en logoti (Zaïre)".

Other Recent Publications

Francis Jouannet. *Le français au Rwanda: enquête lexicale.* Sociolinguistique:
systèmes de langues et interactions sociales et culturelles, 2. Paris:
GERLA-SELAF, 1984. Pp. 232. FF110.

In his introduction the author recalls the historical setting of the co-
cial organisation which has conditioned and permitted the use of a French
vocabulary in this part of the African continent. A practical, alphabet-
ically listed glossary with analysis of those French lexical items spoken
in Rwanda shows a school level knowledge of French. Norms acquired in
school persist in the French commonly spoken in this country and check
any possibilities of lexical creation. The lexical deviation (less than
a thousand) from standard French is similar to that found in any regional-
ly spoken French in France.

Thomas Bearth. *L'articulation du temps et de l'aspect dans le discours toura.*
Sciences pour la communication, Vol. 14. Berne, Frankfurt, New York: Pe-
ter Lang SA, 1986. Pp. 353. br. sFr. 55.-.

La recherche africaniste sur les textes dits de l'oralité n'a guère pri-
vilégié leurs aspects proprement linguistiques. En abordant ce domaine
sur les plans de la théorie et de la méthode, et dans un souci de docu-
mentation cohérente, le présent ouvrage montre que ce sont les éléments
redondants, et non ce qui reste après leur élimination, qui fournissent
la clef d'une compréhension des opérations constitutives de la référence.
Deux outils permettent de donner à cette hypothèse une forme opération-
nelle et validable: une syntaxe séquentielle (élaborée par déduction) et
l'analyse des variables aspectuelles dans une perspective énonciativiste
élargie à la dimension du discours. Tout en voulant être, avant tout,
une contribution à une grammarie (hors guillemets) du discours, ce tra-
vail intéresse aussi la problématique du style littéraire dans un con-
texte de l'oralité.

EIGHTEENTH CONFERENCE

ON AFRICAN LINGUISTICS

The Eighteenth Conference on African Linguistics
will take place

April 23-26, 1987 at the

Université du Québec à Montréal (UQAM)

For information, write to

Isabelle Haïk or Laurie Tuller
Département de Linguistique
UQAM
C.P. 8888 Succ. A
Montréal, Québec H3C 3P8
CANADA

INTERNATIONAL SYMPOSIUM

ON CHADIC LINGUISTICS

May 1-2, 1987

University of Colorado
Boulder, Colorado

The Department of Linguistics announces the International symposium on Chadic Linguistics, May 1-2, 1987. The symposium will deal with all aspects of individual Chadic languages, comparative Chadic linguistics, relations between Chadic and Afroasiatic languages, and genetically non-related languages.

Please send a one page abstract of your paper by December 30, 1986. The proceedings of the symposium will be published.

Send abstracts and inquiries to Zygmunt Frajzyngier
                                Department of Linguistics, Box 295
                                University of Colorado
                                Boulder, CO 80309
                                USA
                                Phone: (303) 492-6959

∗∗

FIFTH INTERNATIONAL

HAMITO-SEMITIC CONGRESS

September 27 - October 2, 1987

University of Vienna

The Fifth International Hamito-Semitic Congress will be held in Vienna from September 27 to October 2, 1987. Registration is requested by December 31, 1986 and an abstract of the paper by June 30, 1987. Payment of the registration fee of Austrian Shillings 500,-- (Austrian Shillings 700,-- after January 1, 1987) should be made to the account of the Congress 0225-02355/00 at the Creditanstalt-Bankverein, A-1010 Vienna, Schottengasse 6-8 (Bank Code 11000). Hotel reservations can be made through Osterreichisches Verkehrsbüro, A-1010 Vienna, Opernring 3-5.

For further information contact Hans Mukarovsky
                                Institut für Afrikanistik
                                Doblhoffgasse 5/9
                                A-1010 Wien
                                AUSTRIA