Metathesis in Highland East Cushitic

Coral Hughto - University of Massachusetts
Stuart Davis - Indiana University
Manchester Phonology Meeting 2014

1 Introduction

• The obstruent-nasal metathesis pattern found in several Highland East Cushitic (HEC) languages is an example of contact metathesis, which occurs to avoid a rising sonority consonant sequence across a syllable boundary

• The Syllable Contact Law (Vennemann 1988) is a cross-linguistic generalization which states that “a syllable contact $A$-$B$ is the more preferred, the less the Consonantal Strength of the offset $A$ and the greater the Consonantal Strength of the onset $B$.” This can be rephrased in terms of sonority as in (1)

(1) Syllable Contact Law
A syllable contact sequence $A.B$ is more preferred the greater the sonority of the offset $A$ and the lower the sonority of the onset $B$.

• Contact metathesis is metathesis that applies to a consonant sequence which violates the Syllable Contact Law and yields a sequence which adheres to it

• Vennemann cites the metathesis pattern found in Sidamo as an example of contact metathesis, illustrated in (2)

(2) Metathesis in Sidamo
a. /gu$d+$nonni/ → [gu$n$.don.ni] ‘they finished’
b. /ha$s+$nemmo/ → [ha$n$.sem.mo] ‘we look for’
c. /ha$b+$nemmo/ → [ha$m$.bem.mo] ‘we forget’

• This metathesis pattern is also found in several related HEC languages, including Kambaata and Alaaba (Treis 2008, Schneider-Blum 2007), and is one of a set of three processes, along with epenthesis and assimilation, which serve to avoid illicit consonant sequences in these languages

• The phonotactics of these languages generally do not violate the Syllable Contact Law, and so we argue that metathesis here is part of a general strategy to avoid rising-sonority consonant sequences across a syllable boundary
This sonority-based account is compared to two alternative accounts, a phonetics-based account (Hume 2001) and a diachronic account (Garrett & Blevins 2009), and argued to be a better explanation of metathesis in the HEC languages than these alternatives.

In §2 the processes of epenthesis, assimilation, and metathesis are described as they occur in Kambaata (Treis 2008). §3 discusses and discards two alternatives to a sonority-based account.

2 Some phonotactics and phonology of Kambaata

Kambaata syllables are maximally CV(V)(C), thus a word-internal consonant sequence consists of two heterosyllabic consonants: a coda and the following onset.

Only certain types of consonant sequences are phonotactically legal, generally following the generalization that preferred sequences have equal or falling sonority:

(3) Preferred consonant sequences in Kambaata
   a. Geminate
   b. Sonorant-Obstruent (e.g. [n.d], [r.b])
   c. Glottal stop-Sonorant (not discussed here)

Relevant illicit consonant sequences and associated phonological processes are listed in (4). These illicit sequences typically arise as the result of verbal inflection, when a verb root is suffixed by a person marker beginning with /t/ or /n/.

(4) Illicit consonant sequences in Kambaata
   a. Complex onset or coda Epenthesis §2.1
   b. Two non-identical obstruents Obstruent Assimilation §2.2
   c. Two non-identical sonorants Sonorant Assimilation §2.2
   d. Obstruent-Sonorant Metathesis §2.3

2.1 Epenthesis

Epenthesis occurs when syllabifying a sequence of consonants would result in a complex onset or coda.

When the problematic sequence results from verbal inflection, the high, front vowel /i/ is inserted between the verb root and following inflection, as illustrated in (5).

(5) Epenthesis in Kambaata verb inflection
   a. /fint+no:mmi/ → [fin.ti nou.mi] ‘we listed’
   b. /toll+ta?u/ → [tol.li ta?:u] ‘she/they will stretch out’
   c. /f+tem+ota/ → [fu.te:no.ta] ‘in order to kill’
2.2 Assimilation

- Assimilation occurs when two non-identical obstruents or two non-identical sonorants come into contact across a syllable boundary, and results in a surface geminate.

- When the final obstruent of a verb root meets the initial /t/ of a person marker across a syllable boundary, assimilation is progressive, such that the /t/ of the suffix assimilates to all of the features of the root segment. This is illustrated by the data in (6).

\[\begin{align*}
(6) \text{Obstruent assimilation in Kambaata} \\
a. /zug+to\ti/ & \rightarrow [zug.go:ti] \quad \text{‘Don’t lurk!’} \\
b. /maze:s+to\ti/ & \rightarrow [ma.ze:s.so:ti] \quad \text{‘Don’t wound!’}
\end{align*}\]

- When the final non-nasal sonorant of a verb root meets the initial /n/ of a person marker across a syllable boundary, assimilation is regressive, such that the root segment assimilates all of the features of the /n/ of the suffix. This is illustrated by the data in (7).

\[\begin{align*}
(7) \text{Sonorant assimilation in Kambaata} \\
a. /mu\r+n\o/ & \rightarrow [mu.n.no] \quad \text{‘Let’s cut!’} \\
b. /dul+n\una/ & \rightarrow [du.n.m.un.ka] \quad \text{‘we are pounding’}
\end{align*}\]

2.3 Metathesis

- Metathesis occurs when a root-final obstruent meets a suffix-initial /n/ across a syllable boundary, forming a rising-sonority sequence which violates the Syllable Contact Law.

- The result of metathesis is a preferred falling-sonority sonorant-obstruent sequence, as illustrated in (8). That is, metathesis repairs the ill-formed syllable contact.

\[\begin{align*}
(8) \text{Metathesis in Kambaata} \\
a. /bi:t?+ne:mmi/ & \rightarrow [bin.t?e:mmi] \quad \text{‘we broke’} \\
b. /bub+n\am:mmi/ & \rightarrow [bun.bam.mi]^{1} \quad \text{‘we will burn’} \\
c. /ka:s+n\unta/ & \rightarrow [ka:n.sun.ta] \quad \text{‘so that we plant’}
\end{align*}\]

- The general phonotactics of Kambaata support the hypothesis that avoiding rising-sonority consonant sequences, which violate the Syllable Contact Law, is an active phonotactic restriction.

- Thus, metathesis can be analyzed as a strategy to repair illicit rising-sonority sequences.

\[^1\text{Nasals must be homorganic with adjacent consonants.}\]
2.4 OT Analysis

- A portion of the Optimality Theory analysis is given here to illustrate a formal account of the metathesis in Kambaata as Syllable Contact metathesis.

- In this analysis, metathesis is motivated by a constraint SYLLABLECONTACT (SYLLCON), which is a markedness constraint targeting a consonant sequence A.B in which A is less sonorous than B.

- The tableau in (9) shows that the metathesis candidate (9b) wins over the fully faithful candidate (9a) because metathesis avoids the violation of SYLLCON at the expense of lower-ranked ROOTCONTIGUITY (ROOTCON), a faithfulness constraint requiring that all root segments which are contiguous in the input be contiguous in the output.

   \[ \text{(9) OT analysis of metathesis in Kambaata} \]

   \[
   \begin{array}{|c|c|c|c|c|}
   \hline
   \text{Candidate} & \text{SyllCon} & \text{Dep} & \text{RootCon} & \text{Agree} \\
   \hline
   \text{a. kas.nun.ta} & \text{*!} & & & \\
   \text{b. ka:n.sun.ta} & & * & & \\
   \text{c. kass.sun.ta} & \text{*!} & & & \\
   \text{d. kas.si.nun.ta} & & & \text{*!} & \\
   \hline
   \end{array}
   \]

- The tableau in (9) also illustrates that the other processes seen in Kambaata, assimilation (9c) and epenthesis (9d), do not apply in this case.

- The assimilation candidate (9c) fatally violates higher-ranked \text{Id[son]} because complete assimilation in this case would require unfaithfulness to a segment’s input specification for \([±\text{sonorant}]\).

- The epenthesis candidate (9d) fatally violates higher-ranked \text{Dep}.

3 Alternative accounts

- Two alternative accounts of metathesis in Kambaata are treated here, one more phonetics-based account (§3.1) and one diachronic account (§3.2).

3.1 Perceptual Optimization

3.1.1 Claims

- Hume (2001) argues that perceptual optimization is often an important phonetic factor in motivating metathesis alternations.

- The idea behind perceptual optimization is that metathesis occurs to move a segment from an environment where its phonetic cues are reduced or otherwise not salient into an environment where its phonetic cues are more salient.

---

2 Complete assimilation in the other direction, \(*\text{[ka:n.nun.ta]}\), would thus also be a losing candidate.

In the case of the HEC languages, the argument would be that metathesis serves to move an obstruent in coda position before a nasal, where its cues are reduced because of the lack of a full release, into onset position where its cues will be more salient.

3.1.2 Issues

- This phonetically motivated explanation is compelling for examples of metathesis involving stops, such as (8a) /bítʲː+nɛ:mmi/ → [bíntʰːɛ:mmi], as the stop is moved into a position conducive to salient release cues without greatly reducing the saliency of the nasal.
- This explanation, however, is less compelling for examples of metathesis with fricatives, such as (8c) /kás+nunta/ → [kán.sun.ta].
- The saliency of frication is less dependent upon context, as its cues are quite strong. Moving the /s/ in example (8c) from coda to onset position does not greatly improve its salience, and even somewhat weakens the cues of the nasal segment by moving it from onset to coda position.

3.2 Evolutionary Phonology

3.2.1 Claims

- Another account of metathesis in HEC is given in Garrett & Blevins (2009), who propose a diachronic explanation.
- They argue that synchronic examples of obstruent-nasal metathesis must be the result of phonological analogy, and do not have independent phonetic motivation.
- In the view of Garrett & Blevins, metathesis arises when a segment is reinterpreted as occurring in a different position than its underlying location (a segment’s extensive phonetic cues make its linear position ambiguous). Given this, obstruent-nasal metathesis is unexpected because nasality cannot leak over adjacent segments without rendering them also nasal. Thus, nasal segments should not be able to be reinterpreted as occurring on the other side of an adjacent obstruent.
- Since the phonetic motivation for obstruent-nasal metathesis is lacking, Garrett & Blevins (2009) explain its occurrence in multiple East Cushitic languages as being the result of phonological analogy.
- They focus on the particular case of Bayso, which has a process of progressive assimilation that applies between stem-final coronal obstruents and suffix-initial /t/ (10a-c), except in the case of stem-final /j/ where “sibilant metathesis” applies (10d). There is also a process of obstruent-nasal metathesis which applies between stem-final coronal obstruents and suffix-intitial /n/ (10e-f). A /t/ and /n/ which come into contact across the boundary between suffixes, however, undergoes regressive assimilation (10g).

---

4Bayso is a Western Omo-Tana language in the East Cushitic family.
Garrett & Blevins argue that the sibilant metathesis observed in (10d) and the regressive assimilation observed in (10g) caused Bayso speakers to reanalyze the progressive assimilation cases in (10a-c) as a two-step process of metathesis and regressive assimilation.

In analogy with this reanalysis, metathesis spread to the obstruent-nasal context in (10e-f), but assimilation was not similarly applied.

### 3.2.2 Issues

- Regardless of its applicability to Bayso, it is unlikely that this explanation could be extended to the metathesis cases found in the HEC languages.
- In the processes in Kambaata discussed in §2, there is no evidence of the sibilant metathesis seen in Bayso (10d), which Garrett & Blevins claim as one of the major motivators in the analogical extension of metathesis to other contexts.
- Additionally, all assimilation in Sidamo is progressive, though, depending on whether this became the case before or after the innovation of metathesis, this may not pose a problem for the diachronic analysis.
- The success of the diachronic account depends on several historical factors, including whether metathesis was innovated before the East Cushitic languages diverged from some common ancestor, or whether it was innovated separately in several languages after that point of divergence.
- More investigation into the historical evolution of these languages would shed light on these uncertainties.

### 4 Discussion

- Perceptual optimization, as discussed in Hume (2001), is a better explanation for stop-nasal metathesis than for fricative-nasal metathesis.
- The diachronic account proposed by Garrett & Blevins (2009) is a better explanation for Bayso than for the HEC languages.
• An account based on sonority and the Syllable Contact Law, however, is able to capture the context and motivation for obstruent-nasal metathesis, as well as express a generalization about the phonotactics of the HEC languages: a dispreference for falling-sonority consonant sequences

• One way to corroborate a sonority-based account could be to investigate, through an artificial language learning experiment, whether learners show a preference for languages which don’t allow rising-sonority consonant sequences over languages which do

References


