The glottal stop in Sereer: a new type of marginal contrast

It has long been noted that the glottal stop is often exploited differently from other segments within the phonological systems of many languages. Sereer\(^1\) (NW Atlantic: Senegal) exploits the glottal stop in a particularly intriguing way.

- In Sereer, the glottal stop is commonly encountered on the surface.
- Existing descriptions (e.g. McLaughlin 1994, Renaudier 2012) list /ʔ/ as a phoneme of the language, and do not note any peculiarities about its distribution.
- I argue that the use of the glottal stop as a contrastive segment in Sereer is in fact quite remarkable:

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With one exception, all occurrences of the glottal stop in Sereer are predictable, and can be accounted for by a number of insertion rules. Only in the past tense marker /-ʔ/ must the glottal stop be considered underlying, and only here does it create contrasts in meaning between utterances.
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In example (1), the only underlying, contrastive glottal stop is the bolded one.

(1)  [ʔoxe ?eetna julaʔ a foolʔaʔ]

/ox-e eet-na jula a foolʔ-a/
3s-DET be.first-REL sell 3s run-PST-DV

‘He who first sold (his wares) ran (away).’

- Within the context of “marginal contrasts” or “marginal phonemes,” the glottal stop in Sereer presents a novel case in which a phone appears to only be contrastive within a single, high-frequency morpheme.

1. Background on ʔ-insertion
- ʔ-insertion is frequent in the world’s languages, and can have a number of different motivations for and conditions on its application.
- In West Africa especially (e.g. Fula, Hausa, Gokana, Dagbani, see Hyman 1988 for an overview), ʔ-insertion can be subject to a complicated set of conditions, and is sensitive to phonological, prosodic, morphologic, syntactic, and pragmatic factors.
- In some languages (e.g. Kaansa, Showalter 2007), ʔ-insertion operates alongside an underlying, contrastive phoneme /ʔ/, which can complicate matters further.

1.1 Motivations for ʔ-insertion:
- To avoid hiatus
  - Malay: /di- + ikat/ → [diʔikt] ‘to tie (pass.)’ (Boroff 2007: 171)
  - (also applies between a root and suffix, but only between identical Vs or after /a/)
- To fulfill an onset requirement
  - Arabic: /ismaq/ → [ʔismaq] ‘listen’ (Boroff 2007: 144)
- To demarcate a stem/root from its affixes
  - German: ver+ antworten → verʔantworten ‘take responsibility’

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\(^1\) All Sereer data comes from fieldwork with Malick Loum, a speaker of the Saalum dialect.
• To demarcate some larger boundary; often a phrasal/utterance boundary
  o Dagbani: "/ò n zú/ → [ò n zúʔ] ‘he will steal’ (Hyman 1988: 118)
  o In English, ? is often inserted phrase initially before a vowel (though the
    conditions are somewhat more complicated (Garellek 2013)).

• To satisfy a minimality requirement
  o Indonesian terms of address (Cohn 2004: 178): when shortening would result in
    less than a CVC word, a final ? is epenthesized.

  long form  short form
  papa        pap       ‘father’
  ibu         buʔ       ‘mother’
  bibi        biʔ       ‘aunt’

  o Gokana (Hyman 1983): all nouns and verbs of the shape CV (with one exception) have a final epenthesized ?.

1.2 ?-insertion can be sensitive to:
• Phonology
  o Hausa (Newman and Van Heuven 1981): ? only epenthesized after a short vowel,
    or a long vowel with high tone (never a long vowel with low tone).
  o Slave (Rice 1989): ? only epenthesized after a CV root w/ high tone, never low

• Prosody
  o Fula, Gokana, Hausa (Hyman 1988): only possible before pause.

• Word class
  o Fula (Arnott 1970): only nouns, adjectives, and (when other conditions are met)
    verbs and pronouns; never on adverbs, numerals, determiners.
  o Gokana (Hyman 1983): usually on CVV nouns, but never on CVV verbs (with
    one exception).

• Stem vs. word
  o Dagbani (Hyman 1988): in positive utterances, can only occur after a stem-final
    vowel, never after a suffixed vowel.

• Syntax, pragmatics: Relevant for some West African languages (Hyman 1988)

2. Sereer ?-insertion:
• How can we be sure if a glottal stop is present?
  o It is phonetically quite salient
  o Word-finally, it blocks the application of a regular process by which a vowel in a
    grammatical morpheme is deleted after a vowel-final word.

(2) /a teere ale/ → [a teere le] ‘the book’
(3) /o pii-fi oxe/ → o pii-fiʔ oxe → [o piifiʔ oxe] ‘the maker’ (see condition 3 below)

2.1 The ?-insertion processes
  We can identify four conditions under which a glottal stop is inserted:

  Condition 1: Insert ? utterance-initially before a vowel, and utterance-finally after a short vowel.
    • A purely prosodically-conditioned process
(4) /a foola/ → [ʔa foollə] ‘he runs’
(5) /foogaam ee a foola yii/ → [foogaam ee a foola yii] ‘I think he’s running’

- Motivation: demarcation of utterance boundary
c.f. Dagbani, English

**Condition 2:** Insert ʔ before any vowel-initial stem/root (this excludes particles and clitics)

(6) /a und/ → [ʔa ʔund] ‘storm’
/nu eed-a/ → [nu ʔeeda] ‘you (pl.) bleed’
/a inoox-a/ → [ʔa ʔinooxa] ‘he stands up’
/o olof/ → [ʔo ʔolo] ‘Wolof person’
/naniim olof we/ → [naniim ʔolo weʔ] ‘I don’t understand the Wolof people’

- Motivation: onset requirement for lexical words, hiatus avoidance
c.f. Arabic

**Condition 3:** Insert ʔ at the end of any CV lexical root.

(7) /fi .../ → [fiʔ ...] ‘to do’
/ga .../ → [gaʔ ...] ‘to see’
/a bo .../ → [a boʔ ...] ‘steam (n.)’
/o ŋoo-:no .../ → [o ŋooʔnoʔ ...] ‘seamstress’ (root /ño/ ‘sew’ with reduplication)

- Motivation: CVC root minimality requirement
c.f. Gokana, Indonesian

**Condition 4:** Insert ʔ at the end of any vowel-final verb root.

(8) /dagi .../ → [dagiʔ ...] ‘to hammer’
/jula .../ → [julaʔ ...] ‘to sell (wares)’

- This is exceptionless: a verb root is never V-final in any environment

(9) Reduplication: /dagi + dagi + -loox/ → [dagiʔdagiʔloox] ‘pretend to hammer’
(10) C initial suffix: /jula + -noor/ → [julaʔnoor] ‘cause to sell’

- Note that this does not apply to nouns. Evidence from the aforementioned vowel-deletion process:

(11) /a coox-a fambe a teere/ → [ʔa cooxa fambe teereʔ] ‘he gives a goat a book’
3s gives goat book
(12) /a bug-a jula a teere/ → [ʔa buga julaʔ a teereʔ] ‘he wants to sell books’
3s wants sell book

- Importantly, deverbal nouns of the shape CVCV do not insert a glottal stop.
If the ? were underlying in the verb root, it would have to be deleted when nominalized, for which there is no motivation; many nouns are of the shape CV/CV.

Motivation for root-final ?-insertion in verbs only:
- The least straightforward of any of these ?-insertion processes
- Often serves to avoid hiatus (-V verbal suffixes are common), but not always.
- We must say that there is a requirement for verb roots to end in a consonant.
- This uniformity of verb-root shape may be in itself desirable, but does not always serve to satisfy any independent constraint (e.g. /dagi/ + /-noor/ = [dagiʔnoor], though *[daginoor] is not ill-formed phonotactically.

c.f. German stem-initial ?-insertion, but root-final instead. Also like Malay stem-final ?-insertion, but applies before a consonant as well as before a vowel.

2.2 Summary of Sereer ?-insertion processes:
- So far, the distribution of ? is completely predictable, and can be accounted for by these 4 insertion processes:

<table>
<thead>
<tr>
<th>Insertion Process</th>
<th>Description</th>
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<tbody>
<tr>
<td>1)</td>
<td>Insert a glottal stop utterance-initially before a vowel, and -finally after a short vowel</td>
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<tr>
<td>2)</td>
<td>Insert a glottal stop before any word-initial vowel</td>
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<tr>
<td>3)</td>
<td>Insert a glottal stop after any monosyllabic vowel-final root</td>
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<tr>
<td>4)</td>
<td>Insert a glottal stop after any vowel-final verb root</td>
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</table>

- These processes are motivated by the following requirements:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Example</th>
</tr>
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<tbody>
<tr>
<td>No word-internal hiatus</td>
<td></td>
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<tr>
<td>Words must begin with a consonant (not required of clitics)</td>
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<tr>
<td>Roots must be minimally CVC</td>
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<tr>
<td>Verb roots must end in a consonant</td>
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</table>

- By comparison with the conditions on ?-insertion in some other West African languages, the Sereer conditions don’t seem all that complicated.
- Compare Gokana (as summarized in Hyman 1988): “In Gokana, [glottal stop] is inserted before pause in declaratives, roughly as follows: (a) on all nouns of the shape CV, most nouns of the shape CV_iV_i, all nouns of the shape CV_iV_j, unless V_j is /i/, all bisyllabic noun stems except tōgō ‘head’; (b) all verbs of the shape CVV except dú ‘come,’ no verb of the shape CVV except nāā ‘make, do,’ bisyllabic verbs ending in -i (with H tone, but not when -i has M or L tone), never on verbs ending in -(C)a, always with verbs ending in causative -(C)E; (c) deictic ‘this’ does not take [glottal stop], while deictic ‘that’ does…”
- However, it must be stressed that there is a crucial difference between ?-insertion in Sereer versus other West African (or any?) languages:
  - Sereer root-final ?-insertion (conditions 3 and 4 above) operate even when the root is not word-final.
While this pattern is attested with root/stem-initial ?-insertion (e.g. German ver-antworten), both Borroff (2007: 170) and Hyman (1988: 114) note that there is an asymmetry whereby this same pattern is not exhibited with stem/root-final ?-insertion.

Sereer appears to show exactly this pattern.

2.3 Other peculiarities of ?:

There are a number of other properties of the glottal stop that mark it as irregular in the languages phonology.

- In roots of the form /Ci/, a glide /y/ may be inserted before a following vowel instead of ?

(14) /ci + aa/ → ciʔa ~ ciyaa ‘you give’
/fi + aa/ → fiʔa ~ fiyaa ‘you make’

- There are many CVCVC roots, but no verb roots of the form CVʔVC, which is unexplained if /ʔ/ were a phoneme with normal distribution.
  - There is however one such noun root, o roʔoy ‘kneecap,’ which is a problem for this analysis.
- There are no roots of the form ?Vʔ, which could be explained if there is a requirement for a root to have at least one consonant underlingingly.
- Of interest: all CVCV verb roots and most CVCV noun roots are borrowed.

3. The past tense -ʔ

- The only place where the appearance of the glottal stop cannot be explained by the above insertion processes is in the past tense marker, which appears directly after the stem.

(15) ret-ʔ-aa-m ‘I went’
ñaam-ʔ-ir-o ‘you didn’t eat’

- As the past tense marker, the glottal stop is clearly not predictable, and is arbitrary. It clearly contrasts phonemically with Ø and all consonants.
- When a ?-insertion rule operates at the end of a verb root, the addition of the past tense marker results in a doubled ??.

(16) /fi + -ʔ + -aa/ → fiʔʔaa ‘you made’ (c.f. fiʔaa ‘you make’)
/jula + -ʔ + -aa/ → julaʔʔaa ‘you sold’ (c.f. julaʔaa ‘you sell’)

- Note that if the ?-insertion rule did not apply in the past tense, there would be no distinction between present and past forms of these verbs.
  - This provides a functional reason to undergo the verb-root-final ?-insertion rule, even when it does not serve to satisfy a phonotactic constraint of the language.

4. Marginal contrasts

- It is often noted that not all phonemic contrasts are treated equally within a language; often the robustness of a phoneme or phonemic contrast can be in some way severely restricted in comparison to other phonemes/contrasts.
Currie Hall (2013) compiles a typology of such “marginal contrasts.” They may involve:
- A phoneme found only in a few lexical items
- A contrasts that is predictable (allophonic) in almost all phonological environments, but not all
- Specialized strata of vocabulary (perhaps foreign borrowings or ideophones)

However, none truly parallel the treatment of the glottal stop in Sereer. Here we have a segment which can be exploited for a contrast in meaning by only one morpheme in language, where this morpheme is rather high-frequency, and represents a very morphologically basic category in the language (tense).

A parallel can be drawn with the exploitation of suprasegmental features (namely tone) which have a purely grammatical function
- In Balilike-Fe’Fe’ (Hyman 1972), the high tone is found only in grammatical morphemes, and in Herero (Möhlig and Kavari 2003), the extra-high tone has a purely grammatical function.
- But it would not be accurate to describe the glottal stop as the realization of some suprasegmental feature in Sereer; once present, it interacts with other segments in the same way as other consonant segments.

Conclusion:
The glottal stop in Sereer can in most cases be analyzed as the result of epenthesis. This epenthesis is in itself somewhat unique, as it involves root-final /ʔ/-insertion. However, /ʔ/ is employed as a contrastive phoneme in and only in the past tense marker. This distribution can be seen as a novel type of marginal contrast. The Sereer facts further speak to the special status of the glottal stop within the phonological system of the world’s languages.

References: