SYLLABLE STRUCTURE OF TELUGU

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ABSTRACT

This paper sets out the paradox in Telugu syllable division that is seen in the context of language use. While one set of data demonstrates violation of the Sonority Sequencing Principle, another set of rules suggests strongly an adherence to it. The possibility that the violations of the Sonority Sequencing Principle are the result of a no-coda principle operating in the language is examined. A study of certain phonological processes in the language suggests however, that a coda must be posited in the language. It is suggested that the experimental responses and language game phenomena are conditioned deeply by the orthography of the language. It is also shown that when judgement tasks rather than production tasks are performed, different syllabic divisions, ones conforming to Sonority Sequencing are accepted.

1. THE PARADOX

1.1. Violation of the Sonority Sequencing Principle

1.1.1. Experimental data. The Sonority Sequencing Principle (SSP), for which evidence exists from a wide range of languages, states that from the syllable peak there must be a decline in sonority towards the edges [1]. This suggests that in the demarcation of syllables, a curve must be visible in terms of the sonority of the constituent elements. However, experimental work done on Telugu shows a preference for syllable division that violates the SSP. For example, in a syllable division task that speakers of Telugu only were asked to do, consonants were always placed with the following vowel. Thus, VCV was V-CV and VCCV was V-CCV irrespective of the type of consonant(s) involved. The only exception to this general trend were clusters with the homorganic nasal. The unequivocal response for VNCV was VN-CV [3]. Similarly, in a subsequent study in which subjects were required to transpose syllables, an intervocalic consonant was always associated with the following vowel, or the consonant and vowel that follow it. In this case, we see that the nasal always goes with the preceding vowel. There was also evidence that English was being processed in the Telugu script. The overall conclusion of these studies is that the writing system plays a very important role in Telugu speakers’ responses in the experimental situation.

1.1.2. Language game. Outside the experimental situation, some evidence for the split of words into syllables comes from language games. One language game involves inserting the nonsense syllable [ka] before every ‘syllable.’ The same split seen in the experimental situations described above is seen here also: VCV is always ka-V-ka-CV and VCCV is always ka-V-ka-CCV except with the homorganic nasal, where, the split is ka-VN-ka-CV. All these instances of language use that involve splitting up a word result in consonant clusters being clubbed together. This results in the violation of the SSP since such sequences as [rgh], [mn], [ll], etc appear in the onset position.

1.2. Adherence to Sonority Sequencing

In this section we present evidence from prosody which shows that knowledge of the sonority principle does exist for speakers of the language. In poetic meters, syllable count is of great importance. Meter in Telugu is stated in terms of the number and weight of the syllables. Syllables are divided into guru ‘heavy’ or laghu ‘light.’ Peculiarly, these rules are stated and taught in terms of the orthography—such as the following statements:

(1) An akSaram (or syllable or grapheme) is heavy if:
   i) it contains a long vowel: (C)V--
   ii) it is followed by a geminate: (C)V--C,CV
   iii) it is followed by a cluster: (C)V--C,CV
   iv) it is followed by a homorganic N: (C)V--N--CV
   v) it is followed by a vowel-less C: CV--C
   In other cases, the syllable is light.

[Note: The divisions given above indicate the sounds represented by a single grapheme.]

This statement of heavy and light syllables is indicative of the intuition that operates here. Clearly, the first consonant in a
cluster is thought to be part of the preceding syllable rather than the following. And, when there is more than one element following the onset, whether it is two vowels (long vowel) or a vowel and a consonant, the syllable is assumed to be heavy. This suggests that a branching rime is required for a syllable to be considered heavy. It does not matter how many consonants occur in the onset position. In the word [pratibha] ‘fame’ for example, the first syllable is light. This in turn suggests that the syllable structure is not a flat structure but a hierarchical one and that this hierarchical structure is onset-rime, not head-coda. The possible structures are given in (2). Stating the rule of the ‘heaviness’ of a syllable by means of (2a) or (2b) becomes complicated. Assuming structure (2c) for the syllables yields the simplest statement. A heavy syllable is one with a branching rime. In this kind of organization, the SSP is not violated.

(2) a) Flat structure

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  S
 / \                       /
onset nucleus   coda
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b) Hierarchical: head-coda

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  S
 / \                        /
head   coda
 / \                       /
  S
 / \  /
  onsets
```

c) Hierarchical: onset – rime

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  S
 / \                         /
rime  coda
 / \                       /
  S
 / \  /
  onsets
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1.3. The No-Coda Hypothesis

Although the facts in 1.1. were described in terms of the orthography, it is entirely possible that another equally plausible principle—one that prohibits codas is operational in the language. Telugu does not permit consonants in the final position except [m, y, w]. Of these, it may be assumed that only [m] is a genuine coda and that [y] and [w] are the result of a phonetic rule of final vowel deletion. Also, borrowings into the language always require a final vowel epenthesis ([i] in the case of final palatal consonants and [u] in all other cases: bench → [benɪɁ], ball → [baalʊ] etc). It is possible therefore to claim that the results seen in the preceding section are due to a general principle operating in the language which disallows all consonants in the coda position. Since [m] is allowed in the word-final position, it is also permitted in the syllable-final position. Although the articulation of the nasal depends upon the following obstruent in that it is assimilated to the place of articulation, (for e.g., [paŋdi, raŋgu] etc), when the word is split, it may be assumed that the nasal is realized by default as [m].

This hypothesis relies on the general assumption that those consonants that are permitted word-finally can be considered to be legitimate syllable-final consonants. This also implies that those consonants that are not permitted in the final position of words are unacceptable as codas inside syllables.

Another point in favour of the no-coda hypothesis is that the definitions of heavy and light syllables in (1) are drawn from Sanskrit and are not originally Dravidian rules. Most clusters in the language are seen in words that are of Sanskrit origin. In fact it is claimed that the Dravidian syllable is CV [2].

Whether or not the no-coda principle is applicable in Telugu, it is obvious that the responses in the experimental situation and the language game data violate some principle or other. If the no-coda hypothesis is correct, it implies that Telugu permits consonant clusters in onset positions that violate the sonority sequencing. On the other hand, if Telugu has codas in the syllable, then there is no evidence for it in the word-final positions. It is therefore necessary to go beyond mere word edges to determine whether Telugu permits codas. A few phonological phenomena are detailed in the following section.

2. ROOT STRUCTURE CONDITIONS

Verb roots in Telugu are bound morphemes. There are some verb roots in Telugu that have alternate forms with and without a final geminate [yy]. When the final consonant is not geminate, the vowel preceding it is lengthened.

(3) i) weyy- ~ weey- ‘put’
    ii) ʃeyy- ~ ʃeey- ‘do’
    iii) muuy- ~ muuy- ‘close’
    iv) koyy- ~ kooy- ‘cut’

These can be explained if we assume that the roots constitute two moras. The first of the geminate occupies the coda position and is moraic. When this is deleted optionally, compensatory lengthening of the preceding vowel fills the empty slot. The weight of the syllable remains constant when there is a branching rime, whether there is a long vowel or a short vowel and a coda. Notice that this matches the principles of syllable weight in prosody set out in (1). This also suggests that the syllable structure should be the one in (2c). The final consonant that remains unsyllabified in the root is syllabified when a suffix attaches.

Another piece of evidence also involving compensatory lengthening comes from [m]-final nouns. When nouns ending with [m] are pluralized, the final consonant is deleted and the preceding vowel lengthened. The deletion is triggered when an inflectional affix attaches. Although this is a morphological process, the lengthening is still within the root.

(4) i) kaSTam kaSTalu ‘difficulties’
    ii) naSTam naSTalu ‘losses’
    iii) jiiviʃam jiiviʃalu ‘lives’
    iv) kannam kannalu ‘holes’

This process can also be explained if it is assumed that [m] occupies the coda position and as a result of deletion of this moraic coda, the other element in the rime lengthens and fills the empty slot. It is seen that borrowings into Telugu from English also exhibit the same phenomenon: [faaram] ~ [faaraalu] ‘forms.’

The third piece of evidence also comes from a root structure morphology which seems to be common to all Dravidian languages. Some words in Malayalam require an epenthetic vowel and it is noticed that such words either have a long vowel or a geminate consonant. This is reflected in borrowings from English as well
In Telugu, the determination of words for which a final epenthetic vowel is required is not absolutely clear. Nevertheless, all monosyllabic words that are borrowed into the language require an epenthetic vowel finally. In the process of borrowing, if the original word contains a long vowel, the final consonant remains single or ungeminated. On the other hand, if the borrowing contains a short vowel, the final consonant is geminated:

(5) a) i. pennu ‘pen’
   ii. jaggu ‘jag’
   iii. bellu ‘bell’
   iv. kappu ‘cup’

b) i. Teepu ‘tape’
   ii. glaasu ‘glass’
   iii. blauzu ‘blouse’
   iv. baalu ‘ball’

This rule obviously comes from Dravidian, and can be explained only if it is assumed that consonants belong in the coda position. They are also moraic contributing to the weight of a syllable. On the basis of these phonological phenomena I now claim that the hypothesis that there is no coda in Telugu is untenable.

3. SYLLABIC SEGMENTATION: JUDGEMENT TASK

If it is indeed true that there are codas in Telugu, the no-coda hypothesis cannot be made use of to account for the language game and the experimental data. This in turn suggests that the orthography was playing a very important role in determining the responses as stated earlier. However, it so happens that all the experiments performed on Telugu earlier involved only production. This did not give the subjects the choice of other possibilities. That is, if the task of syllabic segmentation was understood only as one that required them to manipulate the written word, then they were left with only one choice. In the experiment reported below the subjects were asked to judge the segmentations given of individual words rather than perform the syllabic segmentation themselves.

3.1. The Experiment

Twenty-four disyllabic nouns were given to ten adult speakers of Telugu. The words were divided into four groups, each group consisting of six words. The first group contained words that had open syllables, the second group contained geminates medially, the third contained other consonant clusters medially, while the last group contained a homorganic nasal followed by an obstruent. Three divisions were made of each word and the subjects were asked to choose the most natural division. The word aksaram was once again avoided since it refers normally to the grapheme and there is no appropriate word for ‘syllable’ in the language. The words were given in a random order. In the case of all the clusters the words were split in the following three ways:

(6) a) CVC-CV
    b) CVCC-V
    c) CV-CCV

Some examples of the words used and the divisions offered are given below:

(7) a) Geminates: karra ‘stick’ kar.ra; karr.a; ka.rra
    b) Clusters: bhakti ‘devotion’ bhak.ti; bhak.ti; ba.kti
    c) N+C gampa ‘basket’ gam.pa; gamp.a; ga.mpa

The words with open syllables were split in the following ways:

(8) a) CV(V)-CV
    b) CV(V)C-V
    c) C-V(C)CV

Some examples are given below:

(9) a) maNi ‘gem’ ma.Ni; maNi; m.aNi
    b) pani ‘work’ pa.ni; pan.i; p.ani
    c) t ee ne ‘honey’ t ee.ne; t ee.ne; t ee.ne

The last option, although it does not reflect syllabic division, served two functions. First, it was required so that an equal number of divisions could be provided for all the types of words. Second, it was a foil ensuring that at least at some level, the syllable was the item that was perceived. That is, if anyone chose that division, it would be a clear indication that they were not thinking in terms of syllables. While explaining the task to the subjects in the initial stages words with clusters were used. The various divisions were not given in a set order but were varied across the words while performing the experiment.

3.2. The Results

The responses of the subjects were classified according to the type of syllabic division that was preferred. VCV structures were predominantly V-CV (85%). There were some who preferred VC-V (15%). Nobody chose to place the two vowels together (the option stated in (8c) above). It is seen that the preference is for open syllables.

For the geminates, the VC-CV responses were 38.33%, V-CCV responses were 51.66%, 10% of the responses were VCC-V. The preference is to keep geminate clusters together.

For the other clusters, VC-CV responses constituted 58.33%, V-CCV responses were 36.66% while VCC-V responses were only 5%. The preference is to split the consonants across syllables and consequently accept a coda.

Finally, homorganic nasal and obstruent clusters were predominantly split across syllables. The VN-C division constitutes 93.33% of the total responses. V-NCV and VNC-V each constitute 3.33% of the total responses.

4. DISCUSSION AND CONCLUSION

The results presented above suggest that there is a difference in the kind of responses given based on whether a task is a production task or a judgement task. When we compare these results with those of the production task we see that there were 100% responses in favour of open syllables and also 100% responses in favour of placing all consonant clusters together in the following syllable (barring of course, the homorganic nasal).

What is of significance here is that the preferred option for the clusters is to divide them across syllables. There is approximately a 22% preference for this division over placing
them together in one syllable. The preferred option for the
geminates however seems to be to retain them together in one
place. While the results in and of themselves may not be very
conclusive regarding which is the preference for clusters, they
attain significance in comparison with earlier studies. Even
though the subjects were all bi-literate there was a significant
difference in their performance between Telugu and English [4].
Here, the large number of responses that favoured a split in the
clusters indicates that other possibilities do exist for native
speakers of the language—possibilities that adhere more to the
sonority sequencing. This difference in performance could
indicate that the task was not understood very well in the
experiments requiring production. This is a distinct possibility
given the difficulty in explaining what is required only by means
of examples and without using any words that suggest a
'syllable.'

The preference for the homorganic nasal is still to place it
with the preceding syllable indicating that separating the other
clusters across syllables was not a mere arbitrary choice.

The issue that still needs to be debated is why native
speakers place clusters together when asked to separate words
into syllables in experimental situations. There are still responses
here that do not split clusters, and, in fact, the preference for the
geminates is to place them together. From the phonological point
of view, it might be that this preference is due to a greater
tolerance of plateaus within a syllable. In any case, as stated in
previous studies, the orthography seems to play an important role
in this matter [3, 4]. Notice that the principles of syllable weight
stated in (1) are all stated in terms of orthography. The influence
of the orthography is so strong that the phonological principles
behind these statements have been lost sight of. In fact, a
phonological description is not forthcoming from teachers of the
language either. I conclude therefore that the writing system has
a deep influence on the responses provided in the experimental
situations.

One of the implications of this study is that the presence or
absence of word-final consonants need not be a direct reflection
of syllable–final consonants. This is of course a controversial
statement. But notice that if this view is strictly adopted, then it
should apply to word-initial consonants and clusters as well. It is
seen in Telugu that many of the clusters that appear in initial
positions after the division of a word into sub-parts, are
unacceptable word-initial clusters, apart from being violations of
the SSP. If the no-coda principle is adopted to account for the
language game and the experimental data, a counter argument in
the SSP. If the no-coda principle is adopted to account for the

REFERENCES
John A. (ed.), The handbook of phonological theory. Cambridge:
Blackwell Publishers Inc.
Inquiry, 20, 589-625.
and syllable manipulation abilities of Telugu-English biliterates.
Paper presented at SALA XIX, University of York, York.
structure and vowel harmony in Telugu. PILC Journal of Dravidic
Studies, 6, 55-84.

NOTES
1. This response was true of those who knew only Telugu. Those who
knew both English and Telugu showed mixed responses.
2. In this study, the subjects were all biliterates—they knew both Telugu
and English. Yet their responses matched those of the Telugu-only group
of the first experiment.
3. The details are deliberately stated informally here. Several issues
regarding syllabification in Telugu must be examined in great detail. For
instance, issues such as whether mora assignment and syllabification are
independent of each other and whether roots are syllabified exhaustively
require examination.
4. It might be argued that [m]-final words also are the result of a final
vowel deletion. That is, [sukham] 'happiness' is derived by vowel
deletion from [sukhamu]. Consequently, when pluralization takes place,
the entire final syllable is replaced by the plural [–lu] to give [sukhaalu].
However, notice that this analysis also requires a rule of compensatory
lengthening. Besides it does not explain the alternate plural that exists
[sukhamulu]. I assume therefore that there are two forms of the same
word, one that is used in informal situations ([m]-final) and the other used
in formal situations ([u]-final).
5. There is a debate with regard to the cluster [dʃ] (where [ʃ] is not
syllabic), as to whether the preceding syllable should be considered heavy
or light. This implies that in a word like [ɑdʃru] the syllable division is
either [adʃ-ru-cu] or [a-ʃru-cu]. Now, as far as the sonority goes, both are
perfectly acceptable divisions and the controversy understandable. One of
the solutions provided for this controversy is that if [dʃ] is articulated
lightly, then the preceding syllable is light, if [dʃ] is articulated heavily
then the preceding syllable is heavy. This is the only phonetic/
phonological explanation provided by Telugu scholars. Otherwise, most
people who are taught prosody, which is almost everyone, since it is
taught at the secondary level, are unable to state why the rules should be
what they are.