Telugu Vowel Assimilation: Harmony, Umlaut, or Neither?

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Overview

1. Goals

- Examine claims about Telugu vowel phonology, especially regarding the existence of vowel harmony

- Incorporate new data and determine the validity of the above claims

- Explore the type and quality of evidence that we use to support positing synchronic computations vs. listing forms in the lexicon

2. Origin of Claims about Vowel Harmony

The tangled web of phonological claims — all of which have been bundled into 'vowel harmony' — include progressive and regressive assimilations, umlaut, epenthesis, syncope, and both internal (morpheme-level) and external sandhi level phenomena.

- Kelley (1963) and Wilkinson (1977, a reworking of Kelley in an updated theoretical framework). These appear to be the source from which the 'vowel harmony' rumor started. . . Their claims:

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1. Laxing is triggered by the lax vowel [a] in the following syllable.

   /me:ka/ > [mɛ:ka] 'goat'

2. Laxing is triggered by a lax vowel in the preceding syllable. Here, the first vowel is laxed through (1) above (regressive assimilation), the root-final vowel *a* is deleted by regular sandhi, then the plural vowel is laxed (progressive assimilation). Is supposed to operate across word boundaries, as well.

   /pi:ʈa/ + /ʟu/ > [pɪ:ʈʟʊ] 'bench, stool' (plural)

3. Fronting on a following vowel, across a word boundary, is triggered by a high front vowel [i]. Progressive assimilation.

   /baɳɖi/ /anta/ > [baɳɖænta] 'all the cart, the entire cart'

   /idi/ /u:ru/ > [idü:ru] 'this is a village'

- Subbarao (1971) distinguishes what he calls 'vowel lowering' from 'vowel harmony.' The former is essentially the laxing triggered by *a* in a following syllable discussed in Kelley and Wilkinson (as summarized above). The latter is used to characterize the behavior of medial and final syllable vowels in triisyllabic verb roots when certain suffixes are added. Subbarao does not treat anything from the nominal system under his vowel harmony discussion. Verb root behavior is as follows, according to Subbarao:

  - The addition of the imperative suffix *-u*, the absolutive suffix *-i*, and the negative imperative suffix *-aka* triggers full assimilation of vowels in non-initial syllables, e.g., [ʧaduvu] 'read!'; [ʧadivi] 'having read'; [ʧadavaka] 'Don't read!'.

  - Subbarao notes that not all verbs which fit the pattern he discusses — (C)VCVCV — undergo vowel harmony. He cites as some of the exceptions [ʧemarɖu] 'become wet' (cf. [kudurʧu] 'arrange' which does show the assimilation), [vardhillu] 'prosper', and [telusu] 'know.'

  - Subbarao also states that 'not more than two elements that undergo vowel harmony can occur in a string in Telugu' (551)

- Sastry (1994) considers at length both verbal and nominal forms as well as a number of other scholars' treatments of vowel behavior.

  - He notes that the nominal suffix (marking the genitive) *-i* does not induce harmony but the verbal suffix *-i* (absolutive) does.

  - The plural suffix *-lu* is said to trigger vowel harmony, causing a final *-i* on the noun stem to change to *-u*. In addition, in trisyllabic forms where the medial *and* final vowels are *i*, both change to *u*.

Singular	Plural	Gloss
ba:vi	ba:vulu	well
pilli	pillulu	child
sangati	sangatulu	circumstance
kolimi	kolumulu	forge
muliki	mulukulu	point

– Finally, Sastry claims that there is another harmony process which changes the backness of high suffix vowels to match the backness of a high final vowel of the root (i.e., root-controlled harmony). His examples include dative and accusative case markers which have the alternants *-ku/-ki* and *-nu/-ni*, respectively.

Noun forms that permit either suffix form:

Noun (citation form)	Dative	Accusative	Gloss
u:ru	u:ruku/u:riki	u:runu/u:runi	village
ka:lu	ka:luku/ka:liki	ka:lunu/ka:lini	leg

Noun forms that permit only *-ki/-ni*:

Noun (citation form)	Dative	Accusative	Gloss
ko:ḍi	ko:ḍiki	ko:ḍini	hen
pilli	pilliki	pillini	cat
bomma	bommaki	bommani	doll

- Rama Rao *apud* Sastry (1994) states that some nominal suffixes undergo harmony and others control harmony in the root.

- Krishnamurti (1998) has rules for vowel assimilation including:

  – High, non-root vowels in multisyllabic forms must agree in rounding

  – In tri-syllabic stems, medial vowels become low if a following vowel (over a morpheme boundary) is low.

  – Medial vowels go to [i] if the vowel in the following syllable is [-back].

- Prabhakara Babu (1976) calls patterns of successive identical vowels in monomorphemic roots 'vowel harmony' , e.g.:

Form	Gloss
kalimi	riches
cilipi	naughty
pidapa	later
padaka	bed
erupu	redness
moguḍu	husband

3. Data - Review and Revision

- Replication of previous findings:

  – Unable to replicate the production of any long or short front rounded vowels under any circumstances. Other than Kelley, we have found no other source that states that Telugu has rounded front vowels and no informants or observation of casual conversation has revealed the presence of such vowels.

– 'Overgeneration' of lax vowels

  ∗ Unable to replicate existence of word-final lax vowels under any circumstances.
  ∗ Unable to replicate laxing of long high vowels (cf. forms like /i:ga/ 'fly')

– Conversely, we also found 'undergeneration' of lax vowels, i.e., lax vowels are attested in more contexts than when there is an [a] in the following syllable. So forms like [rɛɳɖu] 'two' are completely ignored. There is no mention of or motivation for the many other lax vowels that do not fit the environmental statements of the various analyses. Superficially, these appear to be the result of closed-syllable laxing but more detailed and systematic examination is required.

• Additional data

– With the exception of Wilkinson (to be discussed at length in subsequent section), no analysis includes a discussion of the ubiquitous epenthetic vowel [-u] and its interaction with the forms in question, although the analysis of virtually every one of these phenomena rests crucially upon the nature of the vowels (underlying or epenthetic) of the forms in question. Epenthetic [u] is well-documented for Telugu, appearing: 1) word-finally after a consonant in both native words and loanwords; 2) medially to break up consonant clusters; 3) as a 'prop vowel' in the realization of Sanskrit syllabic r̥. Jagannath (1981) has a complete survey of the epenthetic vowel in loanword phonology.

– Plural formation in Telugu is extremely messy. There is evidence from speakers' behavior with nonce forms for a productive plural suffix which *may* be /-lu/, but in native vocabulary we see more exceptional forms than 'regular' forms. The 'harmony' process forms which show medial and final [i] in the singular and [u] in the plural are simply one small set of forms that co-exists alongside a number of other sets which show different outcomes for medial and final [i].

Non-'harmonic' plurals:

Singular	Plural	Gloss
ra:tri	ra:triɭɭu	night
poyyi	poyyilu	hearth
ru:payi	ru:payilu	rupee
da:ri	da:rlu	passages
baɖi	baɭɭu	schools
puʈʈi	puʈlu	measure of grain
enimidi	enimidulu	eights

– The UR status of medial vowels in monomorphemic forms is very unclear. We see an enormous number of forms of the pattern (C)VC(u)C(V) which have alternates with and without a medial [-u-], e.g., [nalugu/nalgu] 'four'; [eʤu/eʤuʧu] 'cry'; [ʧalupu/ʧalpu] 'to pass (time)'

– Skewed distributional patterns where medial vowels, when present, almost invariably 'match' the vowel of the following syllable, e.g., [naɖuʧu] 'walk' (citation form).

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– Telugu shows evidence of a semitic-type morphology (non-concatenative). Vowels determine deictic vs. interrogative category in the pronominal, and adverbial systems. Type of deictic, distal or proximate, is also determined by the vowel. Note that vowel length is determined by the root.

Distal	Proximate	Interrogative	gloss
a:me	i:me	e:me	3rd sg non-masc
atanu	itanu	etanu	3rd sg masc
akkaḍa	ikkaḍa	ekkaḍa	there/here/where
a:	i:	e:	that/this/which

4. Analysis of the Data

In order to support an analysis of vowel harmony or other phonological process, we need to have evidence that the process is a synchronic computation. Productivity and predictability are well-established heuristics for synchronic computations.

Nominal vowel patterns

– Productivity - Speakers' production of nonce forms.

Singular	Plural
mapi	mapilu
sisi	sisilu
moni	monilu
rudi:	rudi:lu
ʧinda	ʧindalu
mota	modalu
tuvu	tuvulu
joggu	joggulu

– Evidence for the Acquirer – predictability

In the data section above, we noted that the set of plural forms that look as if they have some sort of vowel assimilation is overshadowed by many sets of non-assimilating forms, including near minimal pairs like [ba:vi/ba:vulu] 'well' and [ra:yi/ra:yilu] 'stone.' There is no predictability with regard to which plural sub-pattern a form with a final -*i* (or medial and final *i*) will show. The situation is parallel to English plurals that show the historical intervocalic voicing pattern (*leaf/leaves*; *house/houses*). An acquirer can no longer deduce the presence of inter-vocalic voicing process from these alternations as its environment has disappeared through sound changes.

– Conclusion: This plural formation is largely lexicalized. Establishing the existence of any synchronic computational processes requires much more detailed argumentation than anyone has offered to date.

Verbal vowel patterns

– Predictability: Verbs whose medial and final vowels are identical in their citation form (in every case they will be [u]) all seem to show agreement with the initial vowel of the suffixe while verbs with non-identical medial and final vowels do not.

– Productivity is slightly more difficult to determine here but we did get a fair replication, distributed by root shape as just described, with nonce forms.

– Is this vowel harmony or something else? We compare below the typical traits of vowel harmony with the Telugu facts.

Property	Found in Harmony Systems	Found in Telugu
suffix-controlled	rarely	yes
full-copy harmony	rarely	yes
morpheme-internal, non-phonological domain	rare/never?	yes

Additionally, the morphemes which trigger are limited in number and have to be lexically specified.

– If it isn't vowel harmony, what is it? Consider again:

1. the prevalent (but odd) distribution pattern of medial and final vowels in Telugu trisyllabic forms;
2. the apparent regular variation between di- and trisyllabic forms (eḍʧu/eḍuʧu);
3. the deictic/interrogative system;
4. the prevalence of [u], the epenthetic vowel, in these forms. In all cases where noninitial vowels of the stem fail to agree with the initial vowel of the suffix, the medial and final vowels are [u]. Note the 'Future' column in the table below.

Citation Form	Imperative	Absolutive	Neg. Imperative	Future	Gloss
ʧaduvu	ʧaduvu	ʧadivi	ʧadavaka	ʧaduvuta:nu	read
aḍugu	aḍugu	aḍigi	aḍagaka	aḍuguta:nu	ask

5. oddball verb roots which do *not* have identical medial and final vowels are non-undergoers.

– Wilkinson (1974) states that 'Verb stems are best analyzed as having no underlying vowels other than those of initial syllables; the vowels which appear in phonetic noninitial syllables are predictable as to quantity, quality, and position.' (p. 254) In a footnote, he goes on to say 'The insertion of vowels into verb stems is basically very simple: *u* appears everywhere if the first vowel in the first inflectional suffix is back and nonlow,*i* appears everywhere if the conditioning vowel is front, and *a* appears everywhere if the conditioning vowel is low.'

– Conclusion - Wilkinson was on the right track. The analysis which fits all the facts is one where there is an empty V slot in medial position which comes to be associated to whatever V is in final position. In the default case, the final V is epenthetic *u*. (The imperative may be just this, of course.) When the final vowel is supplied by a vowel-initial suffix, *a* or *i*, we see the suffix vowel features associated with medial position as well.

Vowel Laxing by *a*

  - – Productive and predictable but more limited in its domain than the literature states (long high vowels do not lax, laxing is only to the immediately leftward syllable)

  - – Only local — morpheme-internal

  - – Not surface true because precedes sandhi (and can lose its environment through sandhi deletion processes)

  - – Often conflated with closed-syllable laxing, the existence of which is supported by loanword phonology (Jagannath1981) e.g., <pit> is borrowed as [pɪʈʈu]

  - – Conclusion: This type of umlaut process, as local vowel assimilation, *could* fall under vowel harmony very broadly construed. However, to call Telugu a vowel harmony language based on this would be like calling OHG a vowel harmony language.

5. Conclusions

  - Telugu does not have vowel harmony in any reasonably restrictive sense of the term. Therefore, when considering cross-linguistic distribution of vowel harmony systems, Telugu should not be counted among those languages containing vowel harmony. (This supports Graff and Nevins' observation at this conference that vowel harmony systems might be more genetically-restricted than a survey of the literature might lead one to believe.)

  - It is not the case that every surface agreement between vowels of adjacent syllables is due to a process that we would call vowel harmony. Many such sequences are lexicalized, such as the Telugu plurals and monomorphemic noun stems.

  - The study of the productivity of these processes by looking at speakers' behavior with respect to nonce forms is an important part of distinguishing between lexicalization and synchronic computation.

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