

MORPHOPHONEMICS OF VERB SUFFIXES IN TSOU

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1. Introduction
2. Some Suggested Phonological Analyses
3. Verb Inflection
 - 3.1. Verbs without Stem Change
 - 3.2. Verbs with Suppletive Suffixes
 - 3.3. Verbs with Final Vowel Deletion
 - 3.4. Some Residual Problems
4. Summary

1. INTRODUCTION

Tsou, an Austronesian language of Taiwan, has commonly been analysed without final consonants in underlying forms. At the same time, there are not only medial consonant clusters of a fair degree of complexity, but also such clusters initially. In addition, final vowels fall phonetically into three separate groups, characterised by devoicing, an [h] offglide, and glottalisation respectively (Lin 1952:210). Along with the unusual contour of its base forms and the variation in treatment of final segments, Tsou is alleged to have a high degree of irregularity in verb inflection. Before inflectional suffixes, some of which have three allomorphs, vowels sometimes change, sometimes drop, and occasionally remain unchanged.

It is the contention of this paper that the underlying structure of this language is far different from that implied superficially by the phonetic data sketched above. The supposedly irregular verb inflection is in fact quite regular; moreover, the underlying morphemes of the language are of a quite different configuration than indicated by an

analysis which demands that there be no morpheme-final consonants. The argument will be that both the treatment of final vowels and the phonological changes involved in suffixing can be accounted for most economically if underlying forms may have, in any syllable, final consonants.

2. SOME SUGGESTED PHONOLOGICAL ANALYSES

With minor difference, previous workers (Ogawa 1935, Lin 1952, Tung 1964, and Tsuchida 1969) consider the segmental phonemes of Tsou to be the following:¹

p	t	c	k	ʔ	i	u
b	d				e	ə
m	n		ŋ		a	
f	s		h			
v	z	r				

Both Tung and Ogawa agree that syllabic vowels may occur without intervening consonants. Two-consonant clusters are quite common, both initially and intervocalically. Tung's phonetic characterisation of consonant clusters will be pertinent to the discussion to follow. He points out that while in general a voiceless stop is unaspirated, "Only when /p t c k/ are followed by /f/ or /s/ a 'puff of the air' is always heard between the stop and the spirant." (Tung 1964:10). This puff of air is so distinct that, as he points out, it is often transcribed as a vowel, either an echo of the preceding vowel or a neutral or low vowel ([ə] or [a]).

While there is general agreement on the status of consonants and vowels, glides are more of a problem. The close phonetic transcription of Ogawa indicates that there is some free variation between vowels and glides. This variation is found within the speech of a single speaker, as, for example, the following set of alternations within a single text (Ogawa 1935):

jaintsa iaintsa 'say'

It does not appear from this data that glides are phonemically distinct from vowels.

Tung never records glides separately in the orthography. Rather, he states a rule for determining whether in context a segment is to be interpreted as syllabic (i.e. a vowel) or non-syllabic (i.e. a glide):

"/e/ is syllabic immediately before another stressed vowel or after it but not in the final position. /o/ is non-syllabic between two other vowels of which the one preceding it is stressed. Otherwise they are syllabic." (Tung 1964:20)

Tung indicates another variation, one between vowels and continuant consonants:

"Whereas Tfuea and Luhtu [Tsou villages] have /pz, nz, hz/, etc., Tapangu [a third village] has the vowel /i/ in place of /z/,... It goes without saying that the /z:i/ correspondence does not apply to /z/ as a simple consonant in Tfuea and Luhtu. In that case /z/ in Tfuea and Luhtu is also /z/ in Tapangu." (Tung 1964:18)

"In the speech of the Luhtu people, another apical vowel we symbolize with 'r' is found in the place of /e/ in the other two dialects on many occasions in certain positions, leaving /e/ totally unaffected [*sic*] in those positions only in relatively few cases ... However, the situation is not so simple in regard to the occurrence of /r/. It is in fact not consistently distinguished from /e/ with different persons." (Tung 1964:20)

These descriptions of vowels and non-syllabic alternations make the nature and form of these non-syllabics far from clear. For example, the segment transcribed as e may either be syllabic, non-syllabic (but presumably not a variant of r), or varying dialectally with r. o may be syllabic or non-syllabic, but presumably distinct from the segment v which is recorded in the phonological inventory.

These variations are attributed, then, sometimes to free variation, and at other times to dialect differences. In any event, their phonemic status is in doubt. As we shall see, proper analysis of these segments is central to the question of canonical form in Tsou. A great deal about their nature and behaviour may be learned through the analysis of verb forms, the problem to which we now turn.

3. VERB INFLECTION

Inflected verbs have both suffixed and unsuffixed forms.² While the unsuffixed verbs may have other affixes, for our purposes we shall be concerned only with the difference between suffixed and unsuffixed forms. These suffixed forms will, furthermore, be limited to two categories: those in which the suffix a (or its putative allomorphs va or za) appears, and those in which the suffix i (with its putative allomorphs vi or zi) appears.

3.1. VERBS WITHOUT STEM CHANGE

Regular verbs are those in which the suffixation of a or i apparently causes no changes in the stem.³ These are such verbs as:

<i>Unaffixed</i>	<i>Affixed</i>	
etokə	etokəa	'strike with cudgel'
əmnə	əmnəa	'be good'
maaseu	paaseua	'fish with a net'
coŋo	coŋoa	'hurt'
tufŋi	tufŋia	'fish by torchlight'
tmələ	taləi	'hear'
eofŋu	eofŋui	'headhunt'
pofuŋu	pofuŋua	'carry on head'
zonso	zonsoi	'shoot deer by a stream'
sume	sumea	'be sweet (of wine)'

Clearly, these forms may be analysed as the simple addition of a suffix to a stem, without morphophonemic change. If all stems are in fact vowel-final, then most of the verbs should be in this category (allowing for some irregular forms). In fact, according to Tung, most verbs are irregular in one way or another. It is these supposedly irregular forms which will in fact demonstrate regular morphophonemic changes.

3.2. VERBS WITH SUPPLETIVE SUFFIXES

A large group of verbs are analysed by Tung as dropping the stem-final vowel of the unaffixed form before adding the suffix. The suffix will then itself be irregular, either *za* or *va* as an allomorph of *a*, or *vi* or *zi* as an allomorph of *i*. For example:

<i>Unaffixed</i>	<i>Affixed</i>	
ahoi	ahoza	'begin'
toʔtoheŋe	toʔtoheŋva	'think'
sifkou	sifkova	'flay'
eansou	eansovi	'breathe'
toniou	toniovi	'wash'
tiavai	taivaza	'hold with two hands'
eiʔmi	eiʔmzi	'come from'

To consider these forms as irregular misses a clear phonological generality. Where the final vowel in the unaffixed form is *i*, the putative suffix begins with *z*; where it is *u* or *e*, the suffix is said to begin with *v*. It is not the suffixes which vary, it is the stems.

The question then is whether a stem-final vowel changes to a consonant before a suffix; or whether on the other hand the consonant becomes a vowel (or glide) in word-final position. Since in the preceding examples we have vowels which have not changed before suffixes, these

must be instances of word-final continuant consonants becoming glides. Only before suffixes are they unchanged.

Additional evidence that these forms should have final consonants in the stem is provided by forms of the following type:

<i>Unaffixed</i>	<i>Suffixes</i>	
aasoe	aasoeza	'peep'
aaŋae	aaŋaeza	'share'
tatae	tataeza	'admire'
ŋøe	ŋoevi	'carry a burden'

We now see that a final *v* or *z* is deleted if word-final following *e*; and this is not the case with word-final vowels, as can be seen from examining the forms previously cited.

3.3. VERBS WITH FINAL VOWEL DELETION

The largest group of verbs falls into yet another category. In this group, verb-final vowels drop without a trace before the suffixes. Examples of verbs of this type are:

<i>Unaffixed</i>	<i>Suffixes</i>	
tiemucu	tiemuca	'hold hands'
efeutu	efeuta	'harvest'
euʔpici	euʔpica	'divide'
sochipi	sochipa	'look after'
tuefisi	tuefisa	'pull out'
aezuhu	aezuha	'change'
miusnu	miusni	'walk to'
iupu	iupi	'be together'
suputu	suputi	'meet'

It was indicated earlier that a consonant is always released, even if it is the first member of a cluster. Tung indicates this release as occurring only before *s* or *h*, but Ogawa transcribes the release vowel generally for all consonant clusters. If the supposed final vowel in the forms above is an echo vowel, then its non-occurrence before a vowel is quite regular. In addition, the consonant release phenomenon is not limited to the environment before another consonant, but word-finally as well. In short, the forms above are to be analysed with stem-final consonants. This final release follows glottal stop as well, and at least one other, previously unanalysed phoneme, as we shall see later.

While the consonant release phenomenon is most often heard as an epenthetic vowel, Ogawa sometimes transcribes a neutral vowel ([ə]) in

this environment. Accordingly, possibly some instances of final schwa are to be included as instances of consonant release, for example:

<i>Unaffixed</i>	<i>Suffixed</i>	
koice	koica	'scold'
coeconə	coecona	'walk'

While most echo vowels follow consonants, some follow a segment transcribed as e:

<i>Unaffixed</i>	<i>Suffixed</i>	
eahŋəeə	eahŋəea	'request marriage'
ehkueu	ehkuei	'encircle'

It is obvious from the assessment of the data so far, as well as from the remarks of Tung quoted earlier, that a large degree of uncertainty exists in the transcription of vowels *vis-à-vis* voiced continuants. In the case of e, for example, the same informants are interpreted as frequently varying between [r] and [e]. On the other hand, e, according to Tung, has a non-syllabic variant which is not equivalent to [r]. Clearly, at least two phonemes, and possibly more, are being confused. The present analysis provides a partial disambiguation. Segments which are followed by an echo vowel are consonants: hence the e preceding the epenthetic vowel above is a consonant, not a vowel or resonant.

The assignment of the epenthetic vowel-forming e to a consonantal phoneme has advantages other than the regularisation of paradigms. One is that the phoneme /r/, which had been restricted to the Luhtu dialect, now must be part of the inventory in all dialects. This is in accord with the notion that dialects are much more likely to differ phonetically than phonemically. It can now be stated that r is much more lax in the Tapangu and Tfuea dialects than in Luhtu. Laxing of voiced continuants in general is characteristic of dialect differences in Tsou. Tung's statements regarding the distribution of r and z *vis-à-vis* e and i may be tabulated as follows:

<i>Luhtu</i>	<i>Tfuea</i>	<i>Tapangu</i>
[..pr..]	[..pe..]	[..pe..]
[..pz..]	[..pz..]	[..pi..]

It is apparent that no laxing rule is present in Luhtu in these examples. The rule is general in Tapangu, and more restricted in Tfuea. One might expect from the fact that Tfuea is intermediate linguistically between Tapangu and Luhtu, in regard to this, that it might also be in the intermediate position geographically. This is the case.

Possibly another apparent irregularity is to be explained by such a continuant laxing phenomenon: this is the absence of final l. It could

well be that this segment is phonetically laxed, if final, in all dialects. Further research is needed to make such a determination.

In addition to the environments described above, some epenthetic vowels appear with apparently no conditioning factor at all. An epenthetic vowel seems to follow directly a final phonemic vowel:

<i>Unaffixed</i>	<i>Suffixed</i>	
zotpuu	zotpui	'pound'
aeiæiæ	aeiæiæa	'take good care of'

Note that a number of instances have already been given with stem-final vowels. In these instances, there is no doubling or lengthening of the vowel in the unaffixed forms. These forms should have some segment between the phonemic vowel and the epenthesis.

Published data on Tsou are particularly inconsistent in regard to the transcription of glottal stop. This suggests that phonemic glottal stop is often phonetically not distinct from a syllable boundary between contiguous vowels. From the viewpoint of systematic phonology, however, the distinction between a syllable break and a glottal stop is critical. If these forms are analysed without final underlying glottal stop, then they are irregular forms. Such an analysis also entails a very unusual distribution for the glottal stop: unlike other consonants, it never occurs in morpheme-final position.⁴ Hence, it is proposed here that these forms do contain a morpheme-final glottal stop, and undergo the regular process of acquiring an epenthetic vowel if the glottal stop is also word-final.

3.4. SOME RESIDUAL PROBLEMS

As was pointed out earlier, verbs which do not change the final vowel before the suffix are far less frequent than those which do. The following are examples of the latter type:

<i>Unaffixed</i>	<i>Suffixed</i>	
toʔtoheŋə	toʔtoheŋva	'think'
eəsgece	eəsŋəcva	'stride away'
toaluŋu	toaluŋva	'angle'
eoəsao	eoəsva	'play'
toesoso	toesosvi	'fly'

In these forms, any final non-front vowel (except a) alternates with a pre-suffix v. The situation with front vowels is more ambiguous, because the transcription of Tung does not differentiate between i and y. Nevertheless, the same pattern does clearly occur when the front vowel is e. Forms with e-y alternation are:

<i>Unaffixed</i>	<i>Affixed</i>	
eepe	eepia	'raise'
psoepepe	psoepepia	'fly up'
soepe	soepia	'stick in'

If the forms which have *v* immediately preceding the suffix are analysed without that segment in the underlying form, then it is impossible to predict the height of the vowel in word-final position. Likewise, the change from *y* to *i* or *e* is unpredictable (quite aside from the fact that there is no independent justification for positing an underlying /*y*/). These forms must have final vowels in the base.

We now have two classes of verbs with final vowels: those where the final vowel may become a glide before the suffix, and those where it does not. The question now is whether these classes are in fact phonologically conditioned; or whether there is simply free variation which is not indicated by the corpus. Another possibility is that these represent morphological classes.

An indication that the difference is phonological rather than simply morphological is Lin's observation that there are audible phonetic differences among final vowels which are otherwise homorganic. The "devoiced vowel" has already been analysed as a final epenthetic segment. The glide-forming and non-glide-forming classes of vowels may possibly coincide with the *h*-offglide and glottal-offglide classes (though not necessarily in that order). A hypothesis for a phonological difference between these two classes should account also for the phonetic difference.

The assumption has been made that vowels optionally become non-syllabic when in contact with other vowels. The last group of forms considered apparently show this type of variation. The verbs which never undergo a final vowel change must then be the exceptional forms.

One possible analysis is that these forms are not vowel-final, but have an additional segment which separates the last vowel from the suffix, a consonantal segment which prevents desyllabification. Such an analysis then raises problems about the nature of the possible final consonant. In this situation, one would expect the consonant to be followed by an epenthetic vowel, or, like *v* and *z*, to become a glide if word-final. In fact, a third word-final glide is described by Lin: the *h*-offglide. If this last offglide is also phonemic, and if it is velar, as seems plausible, then the reason that it is also not heard between vowels is obvious: like the glottal stop, it, too, is heard only as a syllable boundary between vowels.

The positing of a velar continuant, /*ɣ*/, as an underlying phoneme has several arguments to recommend it. Considerations of symmetry, for

example, should call for a voiced velar continuant in a language which has velar voiced stops, nasals, and voiceless continuants, as well as a series of labial, dental, and palatal voiced non-nasals.

Secondly, words which are transcribed with initial vowel seem to be phonologically idiosyntratic when prefixed. It appears likely that some of these apparent idiosyncracies can be resolved by positing an underlying /ɣ/ (realised perhaps as some sort of "smooth onset" contrasting with glottal stop) in initial position in some forms.

It is also the case that related Formosan languages, Paiwan for example, show velars in final position in cognates where /ɣ/ is proposed for Tsou (for example, Ts. /ʔŋayo/, Pai. /ʔaŋaɾ/, 'mouth'; Ts. /fʔuhuy/, Pai. /uquɾ/, 'back'). Comparative data is of course not evidence for synchronic phonology. What it does argue, however, is that there once was such a phoneme in Tsou. The alternative here is that there was independent parallel development of a phoneme in Paiwan and a morphological class in Tsou, a most unlikely prospect. Whether there is now such a phoneme in Tsou or only a morphological class as the remains of an earlier phoneme can only be determined by internal considerations. The evidence cited earlier indicates that there is still such a phoneme.

Another problem which requires further research is that behaviour of voiced continuants. It appears that the demarcation between final segments which take epenthetic vowels and those which become glides is still not clear. In some instances, e.g. tpuzu : tpuza 'put into fire', apparently final *z* receives epenthesis. In like manner, nasals sometimes receive epenthesis, sometimes remain in final position, and sometimes drop. Much more work is needed to understand the complete conditioning for these phenomena.

4. SUMMARY

The description of Tsou without final consonants and with a great deal of irregularity in verb inflection is a description of surface phonetic facts only. From the point of view of systematic phonology, Tsou has morphemes capable of ending in consonants as well as vowels. Further, the inflection is quite regular, with predictable morphophonemic changes.

It is clear that new research in the field is needed to resolve the phonemic and phonetic questions which the available data raises.

NOTES

1. d is transcribed by Tung as l, and the segment which we have transcribed as ə as u. Tung regards the bilabial voiced continuant as an allophone of b, but Ogawa considers it an allophone of v.

2. The suffixes given are for focus. The appearance and form of focus inflection appears to be dependent on aspect as well, however, as are the focus particles of Paiwan, a closely related language. A description of the various forms of focus and aspect particles is given in Ferrell 1970, p. 16. The Tsou forms seem to be comparable.

3. All examples are taken from Tung 1964.

4. Current analyses are very weak with respect to the glottal stop. For example, the only word-initial glottal stops listed in Tung are those in numbers, a highly dubious analysis. A rigorous analysis of distribution would also bring into question the putative pre-glottalised segments b and l. Such an analysis is now in process, and seems to indicate that these segments are phonemically clusters.

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