A PROBLEM OF TELEFOL VERB CLASSIFICATION

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0. Introduction.

In many languages the verbs are most simply described in terms of classes or conjugations which specify certain non-automatic allomorphic alternations. Sometimes these classes are defined by allomorphs of some of the inflectional affixes, and sometimes, as is the case for the Telefol language of Papua New Guinea[1], the classes are related to the allomorphic interaction of the verb root and the first order of affixes. As very little has been written about discovery procedures for such classes[2], the author feels it worthwhile to describe some of his struggles with the classification of Telefol verbs.

1. The Telefol Data.

Telefol verb stems are inflected by suffixes for tense, negation and subject person. The stems themselves contain a verb root, an object prefix in about 20% of verbs, and an aspect suffix whose boundary with the root is often difficult to determine. The morphophonemic alternation is located in the final two tonemes and final vowel of the root and in the aspect suffixes.[3]

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[1] Telefol is spoken by some 4,000 in the West Sepik District of Papua New Guinea. An outline of Telefol verb morphology is to be found in Phyllis M. Healey, Telefol Verb Phrases, Pacific Linguistics A 5, 1965, and Levels and Chaining in Telefol Sentences, Pacific Linguistics B 5, 1966.

[2] The only textbook discussions I have seen are: Eugene A. Nida, Morphology, University of Michigan Press, Ann Arbor, 2nd ed. (1949) pp. 130-147; H.A.Gleason, An Introduction to Descriptive Linguistics, Henry Holt, New York (1955) pp. 87-88; Benjamin Elson and Velma Pickett, An Introduction to Morphology and Syntax, Summer Institute of Linguistics, Santa Ana, California (1965), pp. 28-29.

[3] Actually several inflectional suffixes also exhibit non-automatic allomorphs, but as these correlate exactly with groupings based on stem features, they need not be considered here.

All of the 400 odd conjugated forms of any Telefol verb can be arranged into four groups. Each group may be represented by one standard form (or principal part) such that its stem is in a basic shape suitable for phonologically predicting all the other conjugated forms of that group. This situation is summarized in Table 1.

Table 1

Standard Parts and Stems of Telefol Verbs

Group of Conjugated Forms	Standard Form for that group
Continuative Aspect - all benefactive tenses and non-benefactive A-tenses[4]	Customary Continuative = First Stem + -in
Continuative Aspect - non-benefactive B-tenses	Past Habitual = Second Stem + -nuba ('he') (Note: second stems all end in m or n; and n+n>n.)
Punctiliar Aspect - all non-benefactive tenses	Neutral Punctiliar Non-benefactive = Third Stem + -la ('he') (Note: stems which end in nasals and tal 'come' take suffix -a.)
Punctiliar Aspect - all benefactive tenses	Neutral Punctiliar Benefactive = Third Stem + -ela ('he') or Third Stem + -ma ('he')

Despite the phonological predictability of stem allomorphs within each of the four groups of conjugated forms, there is no such relationship between the four groups. Taking Telefol verbs as a whole, no one of the four standard stems is basic; there are no universally applicable rules predicting three of them from a fourth.[5] Up till now this situation has been handled by recording and memorizing the four standard forms of each Telefol verb, as for Latin. However, it may be asked whether there is any more economical way of specifying Telefol verbs.

[4] The A-tenses include all suffixes with initial vowel and a few with initial consonant; B-tenses consist of most of the suffixes with initial consonant.

[5] The concept of "basic allomorph" is elaborated in Nida op cit p. 45.

Table 2
Characteristic Endings of Four Standard Stems
for 28 Sets of Similar Telefol Verbs

Set No.	Set Size	First Sten	Second Stem	Third Stem	Fourth Stem	Limits on V
A 1	44	——V̀-n	——V̀-m	——V̀	——V́-b	V ≠ a
A 2	12	——V̀-m	——V̀-m	——V̀	——V́-b	V ≠ a
A 3	19	——V́-m	——V́-m	——V́	——V́-b	V=i, u
A 4	5	——á-m	——á-m	——á	——é-b	
A 5	68	——(á)-m	——á-m	——á	——é-b	
A 6	2	——(à)-m	——à-m	——à	——é-b	
A 7	2	——ì-m	——ì-m ——í-n	——ì	——í-b	
A 8	4	——V̀-m	——V̀-m ——V́-n	——V̀	——V́-b	V=i, u
A 9	5	——ú-m	——ú-n	——ò	——ó-b	
A10	10	——V́-n(á)m	——V́-nám	——V́	——V́-b	
A11	15	——à-m	——á-n	——ò	——ó-b	
A12	2	——à-m	——à-n	——ô	——ô-b	
A13	2	——à-m	——à-n	——ó	——ó-b	
A14	7	——à-m	——à-n	——à	——á-b	
A15	17	——à-m	——á-n	——(ú)	——ú-b	
A16	2	——à-m	——à-n	——(ú)	——ú-b	
A17	10	——è-m	——á-n	—— .	——é-b	
A18	3	——è-m	——á-n	——(è)	——é-b	
A19	23	——V́-kàm	——V́-kàn	——V́	——V́-b	V=u, o, a
A20	8	——V̀-kàm	——V̀-kán	——V̀	——V́-b	V=u, a
A21	2	——(ó)-kàm	——(ó)-kàn	——ó	——ó-b	
A22	14	——V̀-nàm	——V̀-nàn	——V̀-n	——V̀-néb	
A23	5	——è-nàm	——è-nàn	——è-n	——(è-n)éb	
A24	43+	——(a-n)àm	——a-(nà)n	——a-n	——(a-n)éb	
A25	29	——V-n(àm)	——V-n(àn)	——V̀-ndá	——V̀-ndáb	
A26	8	——V-n(àm)	——V-n(àn)	——V̀-nó	——V̀-nób	V ≠ e
A27	3	——(á-n#kál)	——á-n	——(è)	——é-b	
A28	2	——(a-n#kal)	——a-n	——(è)	——é-b	

Table 3

Four Standard Stems of 23 Unique Telefol Verbs

Verb No.	First Stem	Second Stem	Third Stem	Fourth Stem	Meaning
A29	ú-m	ú-m	ú	ùú-b	plant
A30	bèémtú-m	bèémtú-m	bèémt(ú)	bèémtú-b	shoot
A31	wìì-m	{wìì-m / wì-n}	——	wìí-b	(bird) dance
A32	núfú-m	núfú-m	núfò	núfó-b	homesick
A33	fítì-m	fítì-m	fítò	fìtó-b	grow
A34	ámè-m	ámá-n	{ámè-dá / ámè}	ámò-dáb	cry
A35	fìkkà-m	fìkkà-n	fìkkò	fìkkó-b	draw bow
A36	ììbà-m	ììbà-n	ììbó	ììbó-b	insufficient
A37	táà-m	tá-n	tóò	tóó-b	shed skin
A38	kwííngà-m	kwííngà-n	kwííngà	kwíìngá-b	be level
A39	fángà-m	fángá-n	fàngà-dá	fàngà-dáb	tear off
A40	kwàà-m	kwà-n	kùl(ú)	kùlú-b	sing
A41	tìnángkà-m	tìnángkà-n	tìnángk(ú)	tìnàngkú-b	hear
A42	àtámà-m	àtámá-n	àtám	àtàmé-b	see him
A43	ìfè-m	ìfà-n	ìfè	ìfé-b	rear
A44	dùkà-m	dùkà-n	dòó	dòó-b	greet, love
A45	dúbkà-m	dúbká-n	dóò	dóó-b	give birth, plant
A46	úm(ò)-kàm	úm(ò)-kán	úmò	úmó-b	become ill, plant
A47	kál(ò)-kàm	kál(ó)-kàn	kálò	kàló-b	bore, gouge
A48	bíkí-nàm	bíkí-nàn	bíkí-n	bíkì-néb	sprout
A49	sì-nàm	sì-nàn	s	síí-b	spend night
A50	dín(á-n#kál)	díná-n	déè	dèé-b	construct
A51	{òólá-n#kál / òól-m}	òólá-n	òólá	òòlá-b	call out

An examination of a sample of 397 Telefol verbs and of their four standard stems reveals 28 sets (or etic classes) of verbs and 23 unique verbs, as presented in Tables 2 and 3, as well as 8 deficient and suppletive verbs which do not warrant further discussion here.[6] Each stem in Table 2 consists of an invariant root abstract (represented by a dash), characteristic root-final vowel and toneme(s), and an aspect suffix (separated from the root by a hyphen).[7] In the analysis of Telefol verb classes, the separate treatment of the root endings and the aspect suffixes has not proved to be advantageous, so from here on they will be taken together, as the "stem ending".

2. Listing versus classification.

Each Telefol verb may be specified by listing its four standard stems. The question to be considered now is how should we proceed in the analysis if we wish to fully specify a verb by listing fewer than four standard stems and by representing the remaining stems by a class symbol.

In selecting which of the four series of standard stems should be listed, three criteria have been considered.

(a) Select that series of stems which shows the greatest range of diversity in its stem endings. Thus there will be minimum diversity in the series of stems which remain to be classified. For example, the first, second and third series of stems show more diversity in their endings than the fourth series, and for that reason one of the former should be selected in preference to the latter.

(b) If two series exhibit the same degree of diversity, select that which has the most other series correlated with it. This will lead to simpler classification of the remaining series under (e) below. (As the Telefol verbs are represented by only four series of stems there is no occasion to apply this criterion.)

(c) If it is decided to select two (or more) series of stems for listing, then select that pair of series which, taken together, exhibit more combined diversity in their endings than any other pair of series. In general, such a pair of series will exhibit minimal structural conformity — have a low degree of correlation in their various stem endings. For instance, the first and third series of stems show more joint diversity and less correlation in their endings than do the first and second series, and the pairing of first and third should be preferred to the pairing of first and second.

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[6] Many of these 397 verbs also occur as the second element in several thousand complex or idiomatic verbs.

[7] In verb sets A22 to A26, as well as in unique verbs A34, A39 and A48, alternative morpheme cuts could be made with the hyphen two or three phonemes to the right.

Table 4

Alternative Classifications of Telefol Verbs

Listed Stems	Unlisted Stems	Number of Classes	Unique Verbs
root abstract only	1st, 2nd, 3rd & 4th stem endings	28	23
1st	2nd, 3rd & 4th	19	13
2nd	1st, 3rd & 4th	17	15
3rd	1st, 2nd & 4th	19	14
4th	1st, 2nd & 3rd	23	18
1st & 2nd	3rd & 4th	16	14
1st & 3rd	2nd & 4th	8	3
1st & 4th	2nd & 3rd	17	12
2nd & 3rd	1st & 4th	9	6
2nd & 4th	1st & 3rd	15	14
3rd & 4th	1st & 2nd	17	13
1st, 2nd & 3rd	4th	2	-
1st, 2nd & 4th	3rd	9	4
1st, 3rd & 4th	2nd	4	-
2nd, 3rd & 4th	1st	6	2
1st, 2nd, 3rd & 4th	-	1	-

In classifying the series of standard stems which remain unlisted, three criteria have been considered.

(d) Group together in the same class those verbs or sets of verbs which show the same features in their unlisted stems, irrespective of any differences there might be in their listed stems. For example, if the First Stem is listed, then for sets A18 and A27 the Second, Third and Fourth Stem endings are identical and these sets should be grouped into a single class.

(e) Group together in the same class those verbs or sets of verbs which have similar endings in their unlisted stems, provided they differ in the endings of their listed stems. Care should be taken to ensure that within a class, the variants of the endings of the unlisted stems are phonologically predictable in terms of the variants of the endings of the listed stems, just as within a phoneme the allophones are predictable in terms of their environment. For instance, if the First Stem is listed, then for sets A12 and A13 the Second, Third and Fourth Stem endings are similar and their tonal differences can be predicted in terms of the tones of their First Stems, and these two sets should be grouped into a single class.

(f) If one wishes to set up a system of classes and sub-classes, select as classifying criteria for the classes those features of the unlisted stem endings which have the largest number of correlated features. In this way, sub-classes will reflect only minor differences of stem endings. This criterion has not yet been applied to the Telefol material.

3. Alternative classifications.

To illustrate the application and value of criteria (a), (c), (d) and (e), all possible combinations of series of stems were considered for listing, and a classification of the remaining unlisted stems was prepared. The results are presented in Table 4 in terms of the number of classes and the number of unique verbs which remain unclassified. It will be seen that the preferences suggested under (a) and (c) are supported by a corresponding reduction in the number of classes.

The problem which remains is to decide which of the classifications offered in Table 4 is the "best". The aim in classifying the unlisted stems is to reduce (1) the total bulk of the grammatical description of the verb system, (2) the combined bulk of the verb entries and the introductory explanation of class symbols in the dictionary, and (3) the memory burden in learning several hundred verbs within the framework of the class system. With this aim in view, the following four criteria are suggested for evaluating the economy of alternative classifications:

(g) There should be a small number of large classes. My personal arbitrary preference is for about 5 classes, and not more than 10. The only classifications which are in this size range are all of those for which three stems are listed and two of those for which two stems are listed (1st & 3rd and 2nd & 3rd).

Table 5

Rules for Predicting Second and Fourth Stems

Verb class	Sets and "unique" verbs in each class	Rules predicting second stem (first stem → second stem)	Rules predicting fourth stem (third stem → fourth stem)
		GENERAL RULES FOR ALL VERBS	
		final syllable (a) → a	final syllable (V) → V final V → V́b final C → Céb
		SPECIFIC RULES FOR EACH CLASS	
1V	A1,3,5,6,10,30,32	final m → m	final VCa → VCéb (provided first stem has final VC(a)m) other final VCV → VCV́b
2V	A2,4,9,33	final m → m	final V́Cá → V̀Céb final V́CV̀ → V̀CV́b
3V	A15,17,20,34,39, 45,46	final è̀m → án (A17,34) other final V̀m → V́n (A15,20,39,45,46)	final VCV → VCV́b final VC → VCéb
4V	A11,18,42,47	final è̀m → án (A18) other final V̀m → V́n (A11,42,47)	final V́CV̀ → V̀CV́b final V́C → V̀Céb
5V	A12,13,14,16,19, 21,22,23,24,25, 26,28,35,36,37, 40,43,44	final {m, n, n#kal} → n stem CVV̀m → CVn	final VCV → VCV́b final VC → VCéb
6V	A27,38,41,48,50,51	final {m, n#kal} → n	final V́CV → V̀CV́b final V́C → V̀Céb
1/3V	A8	final V̀m → {V̀m, V́n}	final VCV → VCV́b
2/4V	A7	final V̀m → {V̀m, V́n}	final V́CV̀ → V̀CV́b

A29, A31, and A49 are still unique; they are somewhat like 2V, 1/3V, and 5V respectively.

(h) There should be a minimum number of unique verbs. This criterion favours the same classifications as (g) does.

(i) The number of given stems should be as small as possible for a classification that falls within acceptable limits by (g) and (h). This narrows the choice to the two classifications for which two stems are given.

(j) If there are classifications which are equally acceptable on the basis of criteria (g), (h) and (i), then the preferable one is that whose rules for variant prediction (see (e) above) are fewer and/or more widely applicable. A detailed examination of the two-stem classifications on these grounds is all that remains to establish the "best" classification for Telefol.

In conclusion, it is suggested that the principles described in this paper could profitably be applied to the analysis of the verbal systems of many languages of New Guinea and North Australia.

4. Postscript.

Since this paper was written, further research has confirmed that the classification which is based on listing the first and third stems is to be preferred. Furthermore, it has become plain that this classification really only involves six classes, two groups of verbs with membership in two classes, and three unique verbs. This is all that is needed to predict the form of the second and fourth stems. The details of this analysis are presented in Table 5.[8]

[8] This paper was read at the 39th ANZAAS Congress, Melbourne, 19 January 1967. Since that time the orthography used in Telefol reading materials has been changed. However, for the sake of uniformity throughout this paper, the earlier phonemic symbolization is used in Table 5.