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by

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PREFACE

It is the policy of the Linguistic Circle of Canberra not to publish very short Occasional Papers individually but to combine two or several papers dealing with related subjects in one Occasional Paper. Such Occasional Papers will be entitled 'Papers in New Guinea (or Australian, Austronesian, etc.) Linguistics' and will be numbered consecutively within each of these subjects. The Papers in New Guinea Linguistics of which the present Occasional Paper is the first number, contain articles on both Papuan (or non-Melanesian) and Austronesian (i.e. Melanesian) linguistics. This may seem incongruous in view of the existence of a special series of Papers in Austronesian Linguistics within the Occasional Papers, but has been decided upon in view of the fact that the Editors expect to receive only few very short papers dealing with Austronesian Linguistics outside the New Guinea area, and numerous papers concerned with New Guinea linguistics, though only a very small proportion of the latter is likely to deal with Austronesian languages spoken in the New Guinea area. If papers on the New Guinea Austronesian languages were to be included with the Papers in Austronesian Linguistics, their publication could sometimes be unduly delayed because of the lack of related papers with which they could be combined.

The Editors.

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INTONATION IN KUNIMAIPA (NEW GUINEA)

ALAN PENCE

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0. Introduction. This paper concerns one aspect of the phonological system of the Kunimaipa language.[1] It is an analysis of a system of pitch signals which are distributed over phrases, and which add *shades of meaning* to utterances.[2]

In analyzing this intonation, two ideas current in the theoretical work of Kenneth L. Pike have been of help. The first is the idea of hierarchy. Pike regards phonology as made up of basic building blocks (units) of various types. These form a series of levels which he organizes smallest to largest in a V-shaped display. The smallest unit is the phoneme. Phoneme units are distributed in such a manner as to produce syllables, and these in turn make up phonological-words, and so on. The intonation of Kunimaipa fits into the total Kunimaipa phonological system at a mid level, which will be called phonological-phrase.

The second idea found helpful came out in 1945 in Pike's treatment of American English intonation. This was the dichotomy he made between *precontour* and *primary contour*. In the current literature, the terms margin and nucleus are used (Pike, 1962). These terms indicate that we may expect to find in phonological systems, peaks of activity and troughs of activity. We may find peaks with certain characteristics, and troughs with differing characteristics. The terms prenuclear contour and nuclear contour are used in this paper to designate trough versus peak activity, and the dichotomy has proved very useful in simplifying the description.

The total Kunimaipa phonological system is described in terms of a hierarchy of levels. On each level, units which occur are described

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in relation to the units with which they contrast, their internal modes of variation, and their distinctive distribution. Each level is seen as having units which are in turn distributed on higher levels. A full expansion of the system is seen in the example (extracted from text).

gi zagař so got / e teagan ƀon / ŋa egar ořa eg//

'Going to inspect (the traps), he found no (game); they were still set.' The whole is a phonological sentence (//). It is subdivided into three phonological phrases (/), six phonological words (double space), and numerous syllables and phonemes. Pitch is marked by solid and broken lines; high pitch above the letters, mid pitch below the letters, and low pitch considerably below the letters. Solid lines indicate crucial pitch points; horizontal dotted lines indicate non-focal or fluctuating pitches.

In other examples a single syllable or segment may occur as the highest level of the system. The phoneme /**e**/ occurs as a syllable, and when spoken in isolation with intonation and other features **e** // 'yes', it is a phonological sentence.

Intonation is an independent system closely related to the whole hierarchy of phonological elements. It fits into the system at the level which we call phonological phrase (P-phrase), making this a very diverse part of the system.

0.1. Units of the Kunimaipa intonation system are primarily defined by pitch. The minimum units of the system are three pitch levels, the intonemes high, mid, and low. These units combine into sequences which we refer to as *prenuclear contour* and *nuclear contour*. There are four contrastive types of prenuclear contour: stepping, rising, falling, and level. There are ten types of nuclear contour: high, mid, low, high-low, high-mid, mid-high, mid-high-low, high-high-mid, mid-low, and mid-low-mid.

A sequence of an obligatory nuclear contour preceded by one or more optional prenuclear contours is termed an intonation word (I-word). In the example, **te pelavo sik** 'at the wall', the first four syllables with their pitch pattern constitute the prenuclear contour. The whole is an intonation word. Pitch is indicated by the solid and broken lines, mid first syllable, high syllables two through four, and low final syllable. The emic content of this I-word is a stepping prenuclear contour followed by a low nuclear contour.

0.2. While the total system is described in terms of three level intonemes, in reality these registers are based primarily on occurrences of the nuclear contours. Though prenuclear contours are describable in these terms, in some respects they appear to function more directly as total contours (note above the contrast in the labels given to prenuclear vs. nuclear contours) which coincide at some points with the levels of the nuclear contours.

Pike (1945, p.70) notes a similar situation in English intonation in the "descending stress series". This is a unique contour in which there may be "more stressed syllables or distinct pitches than can be fitted into four levels".

The main points of contrast between the prenuclear and nuclear contours are: (a) prenuclear contour glides occur only across syllable boundaries; nuclear contour glides may occur on one syllable or across syllable boundaries, (b) prenuclear contours may occur on long strings of syllables; nuclear contours occur on a maximum of two syllables, (c) sequences of up to four prenuclear contours occur unbroken by pause; pause usually occurs between sequences of nuclear contours, or between nuclear contours and following prenuclear contours, (d) prenuclear contours occur at various pitch heights with no apparent contrast of meaning; a change of level in the nuclear contour area indicates a change of meaning.

Though it is the nuclear contour which is obligatory to the I-word, the prenuclear contour appears to carry an equally important meaning load in the system. For this reason the term prenuclear contour has been chosen, rather than one such as precontour which would understate this function.

0.3. This paper will describe first the prenuclear contours, then the levels and glides of the nuclear contours.

In gathering information on the Kunimaipa intonational system, about 3½ hours of taped text of various sorts have been used. Numerous examples of quoted speech are found in this text; thus it is felt that the analysis is made from widely representative data. In addition, informant elicitation has supported the conclusions drawn and added to them in certain respects. However, the treatment is not in any way exhaustive. Rare nuclear contour types may have easily been overlooked. Distributional limitations of the various types are only partially analyzed. In addition, since the analyst does not have a full command of Kunimaipa, it has been impossible to approach a complete description of the meanings of the various units. Further analysis would be aimed at making up these lacks, and at investigating other intonation structures. In spite of the tentative nature of these results and their incompleteness, it is felt preferable to make them available now to other interested scholars.

1. Prenuclear Contour. In the data analyzed, four types of prenuclear contour have been noted: stepping (mid-high), rising (low-high), falling (high-low), and level (mid-mid). As implied in **0.2.**, the internal relationship between the pitches of a prenuclear contour is more important than pitch height itself.

1.1. The stepping prenuclear contour is basically a mid pitch initial syllable followed by an optional high syllable, optionally followed by one or more syllables neutral in pitch. The contour has a meaning of normal or declarative statement. Figure I is a diagram of this contour.

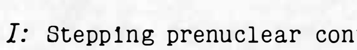

Figure I: Stepping prenuclear contour.

The first two syllables of this contour may be pronounced with low to mid or even low to high pitch. The third syllable (neutral in pitch) may be the same pitch as the second, slightly higher (the vowel /**a**/ tends to draw this pitch up), or slightly lower; additional neutral pitched syllables usually decay in pitch. The final neutral pitched syllable may be drawn up by a following intoneme. Neutral syllables may be very short, or even voiceless following /**s**/. A one syllable statement prenuclear contour may be either a level mid pitch, a low to mid rising glide, or a mid to high rising glide. These patterns are considered allocontours since they appear to vary freely; however, more investigation at this point is needed. In the following examples, vertical stroke (/) divides the prenuclear contour from the nuclear contour. In parenthesis following the lexical meaning is an indication of the intonational meaning of the contour which is being illustrated.

re iparo /mot 'our things (.)'

da ngasi /par 'a weapon (.)'

pim gipijotanang /ma in 'with his vegetables, singly (.)'

ma/vat 'a red thing (.)'

a ba /nap 'man (.)'

na e nari me /no oh 'They used to kill others. (.)'

1.2. The rising prenuclear contour is basically a pattern which begins with a low (or occasionally mid) syllable and rises regularly on each succeeding syllable to a final high syllable. It has a meaning of incompleteness or sequence, and contrasts with the stepping prenuclear contour in that (a) it often begins lower, (b) the initial upstep is smaller, and (c) each succeeding syllable is higher in pitch than the previous. Figure II is a schematic representation of the rising prenuclear contour.

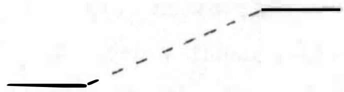

Figure II: Rising prenuclear contour.

Rising prenuclear contours occurring on one to three syllables may begin either low or mid, and those on two syllables often do not rise to high. Four or more syllable occurrences tend to rise the full low to high range, thus in longer ones the up-steps between syllables are very short. This contour is often followed by a high nuclear contour, though most others may also occur.

reipa ro /mot 'our things (. . .)'

rangi /jah 'He lit it. (. . .)'

sapa ne/puh 'He will go and (. . .)'

pop veir vi iha/puh 'This one they covered and left, and (. . .)'

1.3. The falling prenuclear contour begins high and falls progressively throughout. Its meaning seems to be excitement. The contrast between this and preceding types is seen by comparing Figure III with Figures I and II.

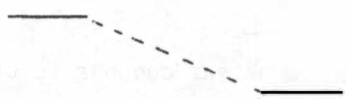

Figure III: Falling prenuclear contour.

In most occurrences of this type pitch drops with each syllable. However, in one example, each succeeding phonological word within the prenuclear contour is lower in pitch than the preceding; but within the word pitch rises slightly.

re iparo/mot

okoh naek am verevat am vol hohoranev hao/han

'Way down somewhere they came out and chanted (!)'

1.4. The level prenuclear contour is a sequence of mid (or occasionally high) pitched syllables. It has a meaning of suspense. It contrasts with the three other prenuclear contour types in that there is no significant rise or fall in pitch throughout. Figure IV is a schematic representation of this type.

Figure IV: Level prenuclear contour.

Careful listening to taped examples of this type reveals minute variation, up or down, from one syllable to another. This variation is without pattern, and does not affect the level character of this contour. The mid level nuclear contour commonly occurs following this type; however, various others (low, high, high-low) have also been observed there.

reiparo/mot 'our things (--)'

aban pongariv tin /am 'two men, very carefully. . . (--)'

menaui/a 'kill chang (--)'

ni vii/hoj 'You go on and put it. (--)'

1.5. In text, sequences of prenuclear contours occur without being interrupted by pause. In a preliminary distributional check of the sequences of two which might occur, only the following were not found: stepping-falling, rising-falling, level-falling, level-rising, rising-level, and level-level. The rare falling and level prenuclear contours are, of course, even more rare in sequence. In the following examples, plus (+) indicates a break between prenuclear contours.

so hot +ka hat +ro pu /vo

'We kept going up inside the mountain, and (.), (.), (.)'

gi/tahar +a/kah /vi'ih 'Later they put him way up there. (.),(.)'

sa/or +vo/sihoi +reipa/ro!/hoi

'. . .younger sisters and brothers, we all. . . (.),(.), (. . .)'

po'ri +kakam /t!o'oh 'Those ones were pained. (!),(--)'

1.6. One or two syllable prenuclear contours are often ambiguous as to whether they are one type or another. A one syllable contour with pitch in the mid to low area might be interpreted as either stepping, rising, or level type. A one syllable contour with pitch in the mid to high area might be interpreted as either stepping, falling, or level type. A two syllable contour rising from low to mid might be interpreted as either stepping or rising type. Three factors are considered in interpreting such occurrences: (a) the height of the pitch, (b) the size of the rise between syllables, and (c) context. The first two are applied according to the contrastive features already given of each prenuclear contour type. Cases which are still ambiguous are interpreted as a type which would be likely to occur in the intonation context.

2. Nuclear Contour. There are ten types of nuclear contour: high, mid, low, high-low, high-mid, mid-low, mid-high, mid-high-low, high-high-mid, and mid-low-mid.

Among the variants of the nuclear contours are those conditioned by their occurrence in the P-sentence. The final syllable of the P-sentence has fast decrescendo and drifts quickly into voicelessness. P-sentence medially (P-phrase finally) a syllable having a nuclear contour tends to have a more controlled dynamic. In addition to this conditioning, contours with final high and low intonemes at P-sentence boundaries tend to glide to extremes of the register.

2.1. *Placement.* Each I-word has a nuclear contour. In most I-words this occurs on the final syllable; however, an occasional I-word has the nuclear contour spread over two final contiguous vowels. The distribution of such occurrence needs further study. At a P-sentence boundary in distinct or emphatic speech, the nuclear contour sometimes occurs on a final unstressed CV syllable. In the example, **ro/ /pu** 'a boy?', the high nuclear contour occurs on the final syllable whereas the prenuclear contour and P-word nuclear stress occur on the initial syllable. If the P-sentence ends with a voiceless variant of the vowel (which is intonationally nonpertinent), the nuclear contour occurs on the antepenult. Pause is not obligatory following a nuclear contour; however, only in rare cases is it omitted. Phrase stress (in contrast to P-word nuclear stress) does not occur. Degrees of emphasis are indicated by variation in general intensity, so that occasionally a P-word or P-phrase nucleus may be very loud, and occasionally very soft. The following examples illustrate the placement of the nuclear contour.

ha ito /kor 'doorway'

ti/na /e 'good thing'

je/ire /vai 'tomorrow'

hasa/ /ha 'He went?'

ha / /saha 'He went?' (with voiceless final vowel)

2.2. *Description.*

2.2.1. The high nuclear contour has a meaning of impending, incompleteness, or normal question. It occurs following the stepping, rising, and level prenuclear contours. It may occur on a final nonstressed CV syllable following the rising prenuclear contour. In this occurrence the contour is extra-high; elsewhere at P-sentence boundaries it is high rising; at P-phrase boundaries it is a level high pitch.

re **iparo/mot** 'our things (incomplete)'

vat **em** **vi** /**jat** 'took, came, and left it, and (incomplete)'

pula **ha/puj** 'the flute's (incomplete)'

vat **e**/**me/ngi** 'You brought it (incomplete)'

ni **vii** /**hoj** 'You go on and put it. (incomplete)'

2.2.2. The meaning of the mid nuclear contour is unknown.[3] It occurs following the stepping, rising, and level prenuclear contours, and has been observed to occur on a final nonstressed CV syllable. It is a mid level pitch in all of its occurrences.

re **iparo** /**mot** 'our things (meaning unknown)'

pi **ak** **epara** /**vah** 'He, up at this place. . . (meaning unknown)'

menge **gi** /**puh** 'We helped them and. . . (meaning unknown)'

me **tat** **sohot** /**het** 'going along putting it. . . (meaning unknown)'

2.2.3. The low nuclear contour has a meaning of normal or unemotional statement. It occurs most often following stepping prenuclear contour; however, it has also been observed following rising, level, and falling prenuclear contours, and on a final nonstressed syllable. It occurs as a low falling glide or extra-low pitch at P-sentence boundaries. At P-phrase boundaries, it is a low level pitch.

re **iparo** /**mot** 'our things (normal)'

a **nga** /**moh** 'I am telling you all. (normal)'

me napaj /hat 'thinking to set (traps). . . (normal)'

ema ha /puh 'they came and. . . (normal)'

pi /ma 'his. . . (normal)'

a ngar a/bu 'people (normal)'

2.2.4 The high-low nuclear contour has the force of an announcement. It usually follows a stepping prenuclear contour, but has also been observed to occur following rising and level. At P-sentence boundaries, this contour drifts quickly into voicelessness and the downglide does not appear to terminate at any particular point. At P-phrase boundaries the end point is more obvious because of contrasting nuclear syllable dynamics (see 2.).

re iparo/mo t 'our things (announcement)'

na e nari me/no oh 'They used to kill others (announcement)'

nga /ro 'Child (announcement)'

hamal a/ho p 'a big snake (announcement)'

hat etet he /je i 'You all listen (announcement)'

2.2.5. The high-mid nuclear contour has (tentatively) a meaning of polite statement. It has been observed only following the stepping prenuclear contour.

re iparo/mo t 'our things (polite)'

ha omaj /to h 'I'm about to speak (polite)'

ma moreg /ha om 'Or will I speak falsely. (polite)'

2.2.6. The mid-low nuclear contour has a meaning of emphatic statement. It has been observed only following the stepping prenuclear contour. At a P-phrase boundary it stops at upper-low rather than gliding to extra-low as it does at a P-sentence boundary.

re iparo /mot 'our things (emphatic)'

tu pumakih /heh 'He was in the men's house. (emphatic)'

ja but tepat o /raej 'There is a money paper. (emphatic)'

/tooh 'They did it. (emphatic)'

2.2.7. The mid-high nuclear contour has meanings of polite request, polite question, or nonemphatic call. It occurs only following the stepping prenuclear contour. When it occurs on a final nonstressed CV syllable, it has either of the latter two meanings.

re iparo /mo t 'our things (polite question)'

i ti /ha v 'the firewood (polite question)'

ha rangije /ngi 'You lit it. (polite question)'

e ro /ma e 'Companion (nonemphatic call)'

2.2.8. The mid-high-low nuclear contour has a meaning of deep feeling such as intense sympathy or desire. It has been observed following only the stepping prenuclear contour. It usually occurs spread over a sequence of two contiguous vowels, but has also been observed on a single syllable. Because it may occur on one syllable, it must be treated as a contour of three intonemes.

re iparo /mo t 'our things (feeling)'

k ivok +v /elat \ /na n 'Fill a bag and give it to me.(feeling)'

po ri +ka kam \ /to o h 'Those ones had pain. (feeling)'

/po v 'This (feeling)'

2.2.9. The high-high-mid nuclear contour is used as an intense or distant call. It occurs on a final nonstressed CV syllable or spread over two V syllables, and is often spoken in a falsetto voice. It has been observed following the stepping and falling prenuclear contours. Because it always occurs lengthened, it has been interpreted as a sequence of three intonemes, in contrast to the high-mid nuclear contour.

re iparomo/ta 'our things (distant call)'

vo nie/vui 'Voniev (distant call)'

e moopai ji tui tui +ji lang lang -gio/gi

'call used when felling trees (distant call)'

va \ ro /ae 'Varoa (distant call)'

2.2.10 The mid-low-mid nuclear contour is used as an excited sequence, both in listing items and as a type of hesitation. It has been observed following the stepping and level prenuclear contours. It occurs on the two final syllables of a P-phrase, either the stressed syllable and a CV syllab e containing /**a**/, or two final contiguous V syllables, the second of which is /**a**/. When it occurs as a hesitation, it is often closed sharply by a glottal stop. The low to mid up-glide occurs on the final vowel, and often a mid to low glide occurs on the preceding syllable.

re iparo /mota 'our things (excited sequence)'

u/**e** /**vora** 'blood (excited sequence)'

api/rara 'sugar (excited sequence)'

pu/ **lahapu** /**pua** 'the flute (excited sequence)'

3. **Implications**. Having completed a study of this type, is it in order to ask what significance it has in the overall linguistic picture. There appear to be four main areas of usefulness: (1) No description of Kunimaipa phonology could be complete without a description of pitch signals. (2) In learning to speak a language, it is necessary to reproduce rhythmic and pitch patterns which are acceptable to speakers for whom the language is their mother tongue. While Kunimaipa is in no sense a major New Guinea language, and thus will not be learned by large numbers of non-indigenes, any further analytical work which is done in it will be furthered by an understanding and use of this system. (3) Various analysts are attempting to bring features of intonation in some way into their grammatical description. In a language like Kunimaipa where intonation obviously has a great deal of importance, a thorough analysis is absolutely necessary if intonation is going to be used with accuracy in the grammatical description. The importance of intonation, however, varies from language to language. (4) This study does not in any way blaze a new trail in phonological analysis; however, it does follow a trail which few have pursued. It is hoped that it may help to clear a few thorns out of the way of others who are struggling with the same problems. Studies of intonation are, to say the least, rare. It is reassuring to note that a systematic approach is possible.

NOTES

1. The main body of the some 8,000 speakers of Kunimaipa live in the Goilala Sub-District of Papua; however, the dialect studied here is that spoken in the Bubu River area near Garaina in the Morobe District of New Guinea. This analysis is based on field work done in the area during 1961 and 1962 under the Summer Institute of Linguistics.

Kunimaipa is in this paper written in a practical orthography which represents 20 phonemes: **p** - /**p**/, **s** - /**s**/, **t** - /**t**/, **k** - /**k**/ (these have stop, affricate, and fricative variants, /**k**/ is backed before mid and low vowels); **b** - /**b**/, **d** - /**d**/, **r** - /**ṛ̌**/, **g** - /**g**/ (these have fortis stop and fricative allophones except for /**ṛ̌**/ which is either flap or trill); **v** - /**ƀ**/, **j** - /**z**/, **l** - /**l**/, **h** - /**ɣ**/ (these have stop, affricate, and fricative variants, except /**l**/ which occurs as either [**l**] or [**dl**]); **m** - /**m**/, **n** - /**n**/, **ng** - /**ŋ**/; **i** - /**i**/, **e** - /**e**/, **a** - /**a**/, **o** - /**o**/, **u** - /**u**/.

2. Pike (1945) defines intonation in this way.

3. Because of the distinctive use of this contour and the place which it fills in the system, it is assumed that a meaning contrast exists.

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THE APPLICATION OF MATRIX TO GAHUKU VERBS

ELLIS DEIBLER, JR.

As investigations are carried on in more and more languages in various areas of the world, it becomes increasingly important to seek new avenues of presentation of findings in order that other linguists may be able to grasp the salient features with a minimum of time and effort. One of the most fruitful developments in the last two years has been the increasing use of matrices in the description of grammar. This paper is an attempt to show the use of matrices in a description of the verb structure of Gahuku, a language spoken by about 8,000 people in the Goroka area in the Eastern Highlands of New Guinea. An attempt is also made in this paper to present the use of a numerical notation system which is directly tied to the various matrices.

Following the tagmemic approach of Pike[1], if one starts with the premise that two constructions are different if they have two differences, at least one of which is internal, we find that in Gahuku we have 95 clause types to describe. To list the features of these one by one would not only be exhaustively time-consuming but would fail to bring out those features which separate one from the other. Therefore we make our initial breakdown into four basic clause types as shown in the following Kernel Matrix (M_k).

M_k

		POSITION	
		Medial	*Final*
DEPENDENCY	*Independent*	100	200
	Dependent	300	400

In our numerical notation system all clause types are assigned a 3-digit number, of which the hundreds digit signifies the Position and Dependency indicated in M_k.

Each of the four clause types has different morphology on the verb (which constitutes the only obligatory unit in the clause) and different distribution in sentences. The distribution of these four types is as follows:

Independent Medial (100) clauses occur in non-final position in a sentence, and have verbs which are independent of the subject and tense of the verb of the final clause. Independent Final (200) clauses occur sentence final and have no dependency on other clauses.

Deibler Jr., E. "The Application of Matrix to the Gahuku Verbs". In Pence, A., Deibler Jr., E., Healey, P. and Hooley, B. editors, *Papers in New Guinea Linguistics No. 1*. A-3:17-26. Pacific Linguistics, The Australian National University, 1964. DOI:*10.15144/PL-A3.17*

Dependent Medial (300) clauses occur in non-final position in a sentence and have verbs which demonstrate dependency as to subject and tense on the verb of the succeeding or final clause.

Dependent Final (400) clauses occur sentence final but are dependent on the action of another clause which may be expressed or implied from the context.

Any of the four basic clause types may occur as a Transitive, Intransitive or Stative Clause. The Transitive and Intransitive clauses may be further subdivided into Benefactive (Ben) and Non-benefactive (Non-ben) clauses. These subdivisions give us the following Action Matrix (M_A):

M_A

	ACTION				
	Transitive		*Intransitive*		*Stative*
BASIC TYPE	*Non-ben*	*Ben*	*Non-ben*	*Ben*	
Ind. Medial	110	120	130	140	150
Ind. Final	210	220	230	240	250
Dep. Medial	310	320	330	340	350
Dep. Final	410	420	430	440	450

The tens digit in the numerical notation system signifies the action of the clause.

Examples of the four basic clause types, using a transitive non-benefactive verb, are as follows:

Ind.Med.	(110)	**húk-a-nazo...**	*cut-he-because...*	"Because he cut it,..."
Ind.Fin.	(210)	**húk-á-moʔ**	*cut-he-emphatic*	"He cut it."
Dep.Med.	(310)	**húk-á-ke...**	*cut-he-after...*	"After he cut it, he..."
Dep.Fin.	(410)	**húk-a-líné**	*cut-he-would*	"He would have cut it."

The features distinguishing between Transitive, Intransitive and Stative clauses are different verb manifesting classes and different obligatory and optional items which may occur in the clause. Non-benefactive and Benefactive clauses have different verb morphology and different optional items which may occur in the clause.

Each of the groups of four basic clause types is further subdivided into types characterized by different function and/or distribution; and in each case this corresponds with different verb morphology. Thus we have the following matrices in which the units digit of the numerical notation system signifies the mood of the clause.

M_{IM} of Independent Medial Clauses -

CFR = Contrary to Fact Result
CR = Contrary Result
CFC = Contrary to Fact Condition.

	ACTION				
	Transitive		*Intransitive*		*Stative*
MOOD	***Non-ben***	***Ben***	***Non-Ben***	***Ben***	
CFR-contrast	111	121	131	141	151
CFR-Reason	112	122	132	142	152
Contrast	113	123	133	143	153
CR-Contrast	114	124	134	144	154
CR-Reason	115	125	135	145	155
Reason	116	126	136	146	156
CFC	117	127	137	147	157

Examples of M_{IM} clauses:

(111)	**húk-ati-liná-moˀza...**	*cut-you-would-but...*	"You would have cut it, but..."
(112)	**húk-atí-li-nazo...**	*cut-you-would-because*	"Since... you would have cut it..."
(113)	**húk-aní-moˀza...**	*cut-you-but...*	"You cut it, but..."
(114)	**húk-ókat-áni-moˀza...**	*cut-lest-you-but...*	"You might have cut it, but..."
(115)	**húk-ókat-áni-nazo...**	*cut-lest-you-because...*	"Since otherwise you would have cut it,..."

(116) **húk-áni-nazo...** *cut-you-because...* "Because you cut it,..."

(117) **húk-atí-lini...** *cut-you-if...* "If you had cut it..."

M_{IF} of Independent Final Clauses

MOOD	Transitive Non-ben	Transitive Ben	Intransitive Non-ben	Intransitive Ben	Stative
Indicative	211	221	231	241	251
Interrogative	212	222	232	242	252
Imperative	213	223	233	243	253
Question	211Q	211Q	231Q	241Q	251Q[2]

Examples of M_{IF} clauses:

(211) **húk-avé** *cut-he* "He cut it"

(212) **húk-ahé** *cut-he?* "Did he cut it?"

(213) **húk-ozó** *cut-imp.* "Cut it!"

(211Q) **nána-mu? húk-avé** *What-for cut-he* "Why did he cut it?"

M_{DM} of dependent Medial Clauses

MOOD		Transitive Non-ben	Transitive Ben	Intransitive Non-ben	Intransitive Ben	Stative
Non-fut. Final Clause	*same subj.*	316[3]	326	336	346	356
	diff. subj.	317	327	337	347	357
Future Final Clause	*same subj.*	318	328	338	348	358
	diff. subj.	319	329	339	349	359

Examples of M_{DM} clauses:

(316)	**húk-á-ke**	*cut-he-when*	"After he cut it, he...."
(317)	**húk-agó**	*cut-he*	"After he cut it, (someone else)...."
(318)	**húk-óko**	*cut-he*	"After he cuts it, he will...."
(319)	**húk-ikó**	*cut-he*	"After he cuts it, (someone else) will...."

M_{DF} of dependent Final Clauses

MOOD	ACTION: *Transitive* *Non-ben*	*Transitive* *Ben*	*Intransitive* *Non-ben*	*Intransitive* *Ben*	*Stative*
CFR Indicative	411	421	431	441	451
CFR Interrog.	412	422	432	442	452
CR Indicative	414[3]	424	434	444	454
CR Interrog.	415	425	435	445	455

Examples of M_{DF} clauses:

(411)	**húk-u-líné**	*cut-I-would*	"I would have cut it."
(412)	**húk-u-líné-hé**	*cut-I-would-?*	"Would I have cut it?"
(414)	**húk-ókat-óvé**	*cut-lest-I*	"Lest I cut it", "I might have cut it"
(415)	**húk-ókat-óhé**	*cut-lest-I?*	"Might I cut it?"

It is well to note here that as we present each new matrix in our grammatical description we must list in detail those criteria which distinguish one clause type from another. For example, we must note the difference in morphology between benefactive and non-benefactive; between indicative, interrogative and imperative. We must list the obligatory and optional features of transitive, intransitive and equational clauses.

We may continue both our matrices and the numerical notations on the morphological level to describe the various tenses, aspects and person-numbers with which each verb may occur. For example, in Independent Final clauses in the Indicative mood we may have the tenses and aspects shown in the following matrix ($M_{IF\text{-}ITA}$):

$M_{IF\text{-}ITA}$

ASPECT	TENSE: *Past*	*Stat.*	*Pres. Prog.*	*Fut.*	*Fut. Prog.*	*Perf.*	*Continuat.*
Declar.	.011	.021	.031	.041	.051	.061	.071
Declar. neg.	.012[4]	-	-	.042	.052	.062	.072
Emph.	.013	.023	.033	.043	.053	.063	.073
Emph. neg.	.014	-	-	.044	.053	.064	.074
Paratactic	.015	.025	.035	.045	.055	.065	.075
Paratactic neg.	.016	-	-	.046	.054	.066	.076

Here we continue to represent intersections of contrasting features by numerals, writing them to the right of the decimal point to indicate that they indicate multiplications of verb morphology which do not have clause-type significance. Note also that the matrix enables us to spot readily those affix combinations which do not occur.

All verbs filling head slots of verb phrases in all clauses occur with the following person-number subjects: first singular, second singular, third singular, first dual, second/third dual, first plural, second/third plural. We symbolize these in the following person-number matrix (M_{pn}):

NUMBER	PERSON: *1*	*2*	*3*
Singular	.100	.200	.300
Dual	.400	.500	
Plural	.600	.700	

In certain verb affixes there is only a dual distinction made between the person and number of the subject. One form occurs when the subject is either singular or first person; these we call mono-focal affixes and assign decimal .800. Another form occurs with second or third person dual or plural subjects; these we call poly-focal affixes and assign decimal .900 to them. The focus matrix (M_F) shows this:

M_F

<table>
<tr><th></th><th colspan="3">PERSON</th></tr>
<tr><th>NUMBER</th><th>1</th><th>2</th><th>3</th></tr>
<tr><td>Singular</td><td rowspan="2">.800</td><td colspan="2">(mono-focal)</td></tr>
<tr><td>Dual
Plural</td><td colspan="2">.900
(poly-focal)</td></tr>
</table>

At this point it may be well to point out the distinctive feature of this numerical notation system. One may readily link the description of affixes with their numerical designations; e.g. the discussion of future tense morpheme may be headed *Future Tense* (.040). Having presented the complete morphology one may subsequently note all the information on a particular verb form, including clause type, mood, aspect, tense and person-number, with a number. For example:

al-e ge-t-o no-u-moq nehe *get-vowel you-benefactive-vowel perfect-I-emphatic interrogative*

"Have I gotten (it) for you?" may be designated "get - you - 222.163"

The use of matrix is helpful in recognition of recurring partials in individual morphemes. Note these person-number morphemes of past tense indicative mood (allomorphs are not included in discussion of individual morphemes here).

$M_{PN\text{-}PI}$

<table>
<tr><th></th><th colspan="3">NUMBER</th></tr>
<tr><th>PERSON</th><th>Singular</th><th>Dual</th><th>Plural</th></tr>
<tr><td>First</td><td>-uve</td><td>-usive</td><td>-une</td></tr>
<tr><td>Second</td><td>-ane</td><td rowspan="2">-asive</td><td rowspan="2">-ave</td></tr>
<tr><td>Third</td><td>-ive</td></tr>
</table>

We note that the recurring partial **-si** is characteristic of dual. Rotation of the matrix points out another recurring partial more easily.

NUMBER	PERSON First	Second	Third
Singular	**-uve**	**-ane**	**-ive**
Dual	**-usive**	**-asive**	
Plural	**-une**	**-ave**	

Here we see **-u** a characteristic of first person.

A further matrix presents a very interesting feature of the person-number morphemes in Gahuku. This consonant matrix (M_C) presents the consonants which occur in the various person-number morphemes of various tenses, aspects, moods and clause types:

M_C

CLAUSE TYPE	PERSON-NUMBER *Second sing., first plural*	*First dual, sec./third dl.*	*1 and 3 sing., 3rd plural*
Past-Decl.-Interrogative	**-p-**	**-s-h**	**-h-**
Past-Decl.-Indicative	**-n-**	**-s-v-**	**-v-**
Past-Emph.-Indicative	**-n-**	**-s-**	-
Future-Decl.-Interrogative	**-p-**	**-?-h-**	**-h-**
Future-Decl.-Indicative	**-n-**	**-?-v-**	**-v-**
Contrary to Fact	**-t-**	**-s-**	-
Dep. Med. same Subject	**-k-**	**-s g-**	**-g-**

Here a matrix has shown us consistencies in consonant patterns between these rather unusual combinations of person-number morphemes that would hardly be apparent otherwise.

A matrix is also of value in noting patterns among the various classes of verbs. Verb stems are divided into classes according to the group of allomorphs of various suffixes with which they occur when these suffixes occur in first position following the stem, and by the occurrence of stem changes and prefixes. The following verb class matrix (M_{VC}) notes the classes which occur:

M_{VC}

FIRST POS. SUFFIX TYPE	SUFFIXED FORM: *No stem change or prefix*	*Oblig. prefix*	*Oblig.* V *change*	*Oblig.* **V** *change and prefix*
Occur with allomorph set A (Class 10)	11 **l-** 'burn'	12 **-l-** 'be hungry'	13 **mVl-** 'put'	(14) **(-lVqm-)** 'take'
Occur with allomorph set B (Class 20)	21 **z-** 'hit'	22 **-m-** 'give'	23 **gVl-** 'hear'	24 **-pVl-** 'kill'
Occur with allomorph set C (Class 30)	31 **v-** 'go'	–	–	–

Here verb classes are assigned to a two-digit number, of which the tens digit signifies the first-position suffixes which occur and the units digit the form to which the suffixes are added.

This verb class matrix illustrates the possibility of using matrix as a search device. We are led to query why there are no classes 32, 33 and 34 until we know that there are only three numbers of class 31 (the stems **l-** "eat", **v-** "go" and ≁ "be". We expect to find a class 14 but do not find any, until we discover that the verb "to take" falls into this class when occurring as a verb auxiliary in a verb phrase.

In summary we may note the following positive values of the use of matrix[5] with regard to the Gahuku verb system:

1. It enables others to gain a quick and graphic outline of structure.
2. It eliminates a great amount of repetition in description by noting successive breakdowns of units.
3. It points to holes in patterns, either for further investigation or for recognition.

4. It enables us to note patterns of structure that would probably remain undetected otherwise.

In addition we suggest the following positive values of the numerical tagmeme rotation system:

1. We may designate not only morphemes but contrastive tagmemic features by numerals which are intersections of labelled axes.
2. We may specify clause types as well as morphological units, and distinguish that morphology which has clause significance from that which does not.
3. We have a very convenient shorthand for identification of verbal units in literal translations accompanying texts.

NOTES

1. K.L. Pike, "Dimensions of Grammatical Constructions", *Language* 38, 1962; also R.E. Longacre "String Constituent Analysis", *Language* 36, 1960.

2. The number 1 in the units digit is used again as a memory device to remind us that the real morphology in question clauses is identical with that for Indicative clauses.

3. As an aid to memory an attempt is made to have the numbers in the units column in matrices M_{IM}, M_{IF}, M_{DM} and M_{DF} signify as far as possible the same features with respect to mood. Hence in M_{IF} and M_{DF}, 1 and 2 in the units column refer to indicative and interrogative. 413 is omitted because 3 in the units column in M_{IF} refers to imperative. M_{DM} starts with 316 because the indicative-interrogative-imperative distinctions of M_{IF} are not pertinent to M_{DF}.

4. An alternative is to make negative vs. affirmative a separate matrix. Its disadvantage is that it would necessitate an additional numeral.

5. For further discussion of matrix, see K.L. Pike, "A Syntactic Paradigm", *Language* 39, 1963.

Deibler Jr., E. "The Application of Matrix to the Gahuku Verbs". In Pence, A., Deibler Jr., E., Healey, P. and Hooley, B. editors, *Papers in New Guinea Linguistics No. 1*.
A-3:17-26. Pacific Linguistics, The Australian National University, 1964. DOI:*10.15144/PL-A3.17*

TELEÉFOÓL QUOTATIVE CLAUSES[1]

PHYLLIS M. HEALEY

1. STRUCTURE OF THE QUOTATIVE CLAUSE

One of the contrastive clause types of Teleéfoól is the QUOTATIVE[2]. It is characterized by the obligatory occurrence of some form of the verb **akankalin** as PREDICATE, and the obligatory occurrence of a QUOTE, a clause-level unit unique to the Quotative Clause. The Quote consists of a complete utterance terminated by one of the almost obligatory QUOTATIVE MARKERS, **kalaá** or **oó**. This utterance may be a single-clause or multi-clause utterance, or an exclamation, i.e. a non-clause.[3] The verb **akankalin** and the markers **oó** and **kalaá** do not occur elsewhere.

The clause-level units occurring in the Quotative Clause are limited to three: optional Subject, obligatory Quote, and obligatory Predicate (a form of **akankalin**), in that order. The Naming sub-type alone has an additional obligatory unit, an Object, which follows the Subject in order.[4] Most other clause types contain many more (optional) clause-level units, including Time, Accompaniment, Location, Beneficiary, Complement, Destination, Instrument.

The Quotative Clause is in fact a class of clause types which resemble one another much more than they resemble any other clause type. However, they also differ contrastively from one another in several important ways, and so may be said to constitute sub-types of the Quotative Clause. The following sub-types have been distinguished.

(a) SAYING, in which the final Predicate of the Quote may contain any tense, and the Quote Marker is **oó**, or, more rarely (16% of occurrences), one of the common Utterance Terminals, such as the Indicative Indicators **koo**, **kwa**, or **kuba**, or the Interrogative Indicators **a** or **áka**. These occur more frequently in this context in the speech of members of the older generation. The younger generation prefer always to use **oó** rather than to distinguish the character of the Quote by using Utterance Terminals. Only the Saying sub-type may have an exclamation as Quote.

(b) DESIDERATIVE, in which the final Predicate of the Quote contains a non-real tense (Potential or Future), and the Marker is obligatorily **oó**.

(c) DIRECT IMPERATIVE, in which the tense of the Quote-final Predicate is usually Potential, but may be Dependent or Abilitative, the Marker is **oó**, and the Quotative Clause Predicate is unmarked for person and followed by an Indicative Utterance Terminal (**akeeta koo**). That is, it is a non-finite closed Predicate. Only the Imperative

Healey, P.M. "Teleéfoól Quotative Clauses". In Pence, A., Deibler Jr., E., Healey, P. and Hooley, B. editors, *Papers in New Guinea Linguistics No. 1.* A-3:27-34. Pacific Linguistics, The Australian National University, 1964. DOI:10.15144/PL-A3.27

sub-type may not have an Equational Clause as Quote. It should be noted that this is the Direct Imperative ('Do it!'), not the Quoted Imperative ('"Do it!" he said.'), which is a variety of the Saying sub-type.

(d) NAMING, in which the Quote consists of the NAME (analysable as an Equational Clause), and an obligatory Object occurs. This Object is a Noun Phrase, and is the thing named or REFERENT. A clause-level free Object does not occur in other sub-types of Quotative Clause. The Marker is **oó**.

(e) PERCEPTIVE, in which the Potential tense does not occur in the Quote-final Predicate, and the Marker is obligatorily **kalaá**.

The contrastive features of these five Quotative Clause sub-types are tabulated in Chart I, and illustrated in a syntax paradigm in Chart II.

CHART I

CONTRASTIVE FEATURES OF QUOTATIVE CLAUSES

Clause Sub-Type	*Object*	*Quote*		*Predicate and Clause Terminal*
		Tense of Verbal Predicate	*Marker*	
SAYING	-	Non-Potential, Potential	**oó**, **<koo>**	Finite; Non-Finite Open
DESIDERATIVE	-	Potential	**oó**	Finite; Non-Finite Open
DIRECT IMPERATIVE	-	Potential	**oó**	Non-Finite Closed
NAMING	Noun Phrase	(Equation) Name	**oó**	Finite; Non-Finite Open
PERCEPTIVE	-	Non-Potential	**kalaá**	Finite; Non-Finite Open

CHART II

ILLUSTRATIVE PARADIGM OF QUOTATIVE CLAUSES

Clause Sub-Type	*Object*	*Quote*		*Predicate and Clause Terminal*	*Free Translation*
		Predicate	*Marker*		
SAYING	-	**únbí** "I went"	**yoó**	**akeélá koo.** he said	He said he went.
DESIDERATIVE	-	**unoón** "I'll go"	**oó**	**akeélá koo.** he wanted	He wanted to go.
DIRECT IMPERATIVE	-	**unoón** "I'll go"	**oó**	**akeeta koo.** must	I must go.
NAMING	**boómí wín** her name	**Fuúmeen** "Fuumeen"	**oó**	**akeélá koo.** he called	He called her Fuumeen.
PERCEPTIVE	-	**únbú** "She went"	**kalaá**	**akeélá koo** he saw	He saw her go.

It will be noted that the Potential tense may occur in the Quote of the Saying sub-type. In the majority of these cases the Potential represents a Quoted Imperative, and there is little ambiguity with the Desiderative sub-type. However, a few utterances occur involving other than second person, particularly first person cases, and here the Quotative Clause is ambiguously of the Saying or the Desiderative sub-type.[5]

2. MEANING OF THE QUOTATIVE CLAUSE

The semantic range of the verb **akankalin** extends from 'say, think' (Saying sub-type) to 'see, know, feel' (Perceptive sub-type).[6] However the whole class of clauses has been termed Quotative because all must be regarded as a kind of "direct speech" - or "direct cerebration". The pronoun suffix of the final verb of the Quote is that which one would predict for direct speech involving a SPEAKER (Subject of **akankalin**), an ACTOR (Subject of the final Predicate of the Quote), and a HEARER.

The Hearer is often not overtly indicated. It may, however, be indicated by a benefactive affix in the Predicate of an Associated Clause; or, very occasionally, when there is no other indication in the context at all, by a first or second person prefix on **akankalin** itself. For example, the Saying example in the paradigm could read: **únbí yoó nakeélá koo**. 'He told me he went.' ('"I went," he said to me.').

If Actor and Speaker refer to the same individual, or if the Actor includes the Speaker, the Actor will be a first person suffixed pronoun. 'He told me he'd go' may be literally translated, '"I'll go," he told me'. 'He wanted to go' may similarly be translated, '"I will go," he wanted'.

If Actor and Hearer refer to the same individual, the Actor will be a second person suffixed pronoun. So, 'He told me to go' would be literally, '"Go!" he told me'. 'He wanted you to go' would be, "He'll go", he wanted (concerning you)'.

If Actor, Speaker, and Hearer all refer to different individuals, then the Actor will be a third person suffixed pronoun. So, 'He told them I'd gone' would be, '"He has gone," he said to them (concerning me)'. 'He wanted me to go' would be, '"He will go," he wanted (concerning me)'. 'He told them you'd gone' would be, '"He has gone," he told them (concerning you)'. 'He saw them go' would be, '"They went," he saw'.

The Quotative Clause sub-types appear to have roughly the following central areas of meaning:

SAYING: 'say, tell <him>[7], think, wonder' (The Quote is what is said, etc.)

DESIDERATIVE: 'want to, try to, be going to' (The Quote is what one wants to do or wants done.)

DIRECT IMPERATIVE: 'do!, must, should, ought to, let <him>' (The Quote is the command, etc. All person suffixes occur in the Direct Imperative.)

NAMING: 'call <him>, name <him>' (The Quote is the name.)

PERCEPTIVE: 'see (that), know (that), feel that, realize that' (The Quote is what is seen, etc.)

The Saying sub-type particularly has a very wide semantic range of usage, as illustrated by the following, of which the first three have an Exclamation as Quote, the next two an Equational Clause as Quote, and the final two a Predicative Clause as Quote.

(uu) oó akeélá koo. 'He agreed.' ('"Yes," he said.')

waák(uu) oó akeélá koo. 'He refused.' ('"No," he said.')

mísám oó akeélá koo. 'He thanked (him).' ('"Thanks," he said.')

aáfeén oó akeélá koo. 'He believed it.' ('"It is true," he said.')

boótá támbálim oó akeélá koo. 'He approved it.' ('"That is good," he said.')

unoónteemaálú tab oó akeélá koo. 'He doubted that she would go.' ('"She will not go perhaps," he said.')

Fuúmeen kanúbú yoó akeélá koo. 'He accused Fuumeen.' ('"Fuumeen did it," he said.')

The areas of meaning of the various clause sub-type overlap to some extent, and make analysis more difficult. Within each area of meaning, the exact meaning of the clause is specified by the context, especially by the Associated Clause, if present, and the content of the Quote, as can be seen in the above examples. Thus, the Saying sub-type means 'ask' if the verb **dákaákaamin** is the Predicate of the clause associated with the Quotative Clause, and/or if the Quote is an interrogative utterance.

3. ASSOCIATED CLAUSE

In about one-third of its occurrences the Quotative Clause has associated with it another clause in apposition with it. In most instances the Associated Clause precedes the Quotative Clause, in some instances it follows, and in about as many instances Associated Clauses both precede and follow a Quotative Clause, redundantly conveying similar information.

The main function of the Associated Clause is to spell out the specific meaning of the **akankalin** verb of the Quotative in any particular instance. For instance, the commonest verb of the Associated Clause of a Saying Clause is **bákaamin** 'say', while the commonest one with a Perceptive Clause is **utámaamin** 'see'. The Associated Clause also serves as a vehicle for additional clause-level units that do not occur in the Quotative Clause, such as Time and Beneficiary.[8]

In the great majority of instances there is a connective suffix on the Predicate of the first of the two apposed clauses, and this is overwhelmingly either **-ta** or **-ileé** (• **-leé** after a vowel), of which **-ta** is the commoner. No meaning distinction between these connectives can be ascertained, but they differ slightly in distribution, as will be demonstrated later.

The verb occurring as Predicate of the Associated Clause, therefore, and to some extent its connective suffix, provide extra diagnostic criteria for establishing the sub-types of Quotative Clause, which have already been set up on internal structural evidence. There is a further criterion for distinguishing the Saying Clause from the Desiderative Clause. The suffixed Subject of the Predicate of the Associated Clause is always the same as that of the Quotative Predicate **akankalin**, except in the case of the Purposive variant of the Desiderative sub-type, where it may be same or different.

The SAYING Clause co-occurs most frequently with the verb **bákaamin** 'say, tell <him>', often co-occurs with **dákaákaamin** 'ask' and **fúkúnin** 'think', and less frequently with certain other verbs. The connective is usually **-ileé** (55% of all occurrences), though **-ta** also occurs. The Saying Clause in the paradigm could therefore be extended to: **bókoonalaleé únbí yoó akeélá koo**. 'He said he went.' ('He said "I went" he said.')

The DESIDERATIVE may have an Associated Clause. When this occurs the pair of clauses have a PURPOSIVE meaning, the Quote being the purpose for which the action of the verb of the Associated Clause is performed. The Associated Clause may contain any verb as Predicate. This Associated Clause is not in an apposition relationship with the Quotative Clause as are the Associated Clauses of the other sub-types. A special case of the Desiderative (Purposive) is that involving a "why" clause as Quote. The "why" clause has only two possible forms, **íntabeén** 'Why (is it)?' (Equational), and, **íntabeén núlán** 'Why did I/you/he?' or, **íntabeén núlúm** 'Why did we/you/they?' (Predicative). The suffixed pronouns so far observed in this situation are always first person. The Associated Clause always follows a "why" Quote Clause. The most frequent connective occurring with the Desiderative (Purposive) is **-ta** (70% of all occurrences), but **-ileé** also occurs.

íntabeén núlán oó akeeta tálbá ya. 'Why did he come?' ('"What will I do?" wanting he came.')

talnalata unoón oó akeélá koo 'He came because he wanted to go.' ('He came "I will go" he wanted.') (This is an extension of the Desiderative Clause in the paradigm.)

The IMPERATIVE type does not have an Associated Clause.

The NAMING type may have an Associated Clause, in which **bákaamin** 'say' is the only verb observed to occur. **-ileé** and **-ta** occur, but there are insufficient examples to assess their relative frequency. An extension of the Naming Clause in the paradigm could be:

bókoonalaleé boómí wín Fuúmeen oó akeélá koo. 'He called her Fuumeen.' ('He said her name "Fuumeen" he called.')

The PERCEPTIVE type has an Associated Clause in at least half of its occurrences, and in 70% of these occurrences the verb occurring in the Associated Clause is **utámaamin** 'see, know, feel'. **feenin** 'wait, watch for' and **tinángkaamin** 'hear' also occur. There is a connective suffix **-tiyeé** which occurs with the Perceptive in 40% of its occurrences, and rarely occurs elsewhere. The connective **-ta** also often occurs here (30% of occurrences); **-ileé** occurs more rarely. The Perceptive Clause in the paradigm might be extended thus:

utámatiyeé únbú kalaá akeélá koo. 'He saw her go.' ('He saw "She went" he saw.')

4. COMPLEX QUOTATIVE CONSTRUCTIONS

Two types of complex Quotative construction occur in the language - Sequential and Nested constructions.

The SEQUENTIAL construction involves a string of Quotes, each ending in **oó** (or **kalaá**), occurring before a single **akankalin** Predicate. In this construction, the Quotes are in a co-ordinate relationship with one another, and therefore all belong to the same sub-type. For example, **talbaálú kalaá únbú kalaá akeélá koo**. 'He saw that she didn't come, she went.' ('"She didn't come, she went," he saw.')

The NESTED construction on the other hand may consist of various different Quotative Clause sub-types. A number of Quotative Clauses may occur in a layered or nested arrangement such that the first span of speech containing a Quote and terminating in a form of the verb **akankalin** followed by **oó** or **kalaá** is the Quote of the second **akankalin**; that Quote plus the second **akankalin** followed by **oó** or **kalaá** is the Quote of the third **akankalin**, and so on. The following example contains four syntactic layers, all of clause level, nested within one another. The innermost is a Quote consisting of a minimal clause, the Predicate **kanumanteémí** 'I will do it' plus **kalaá**; the second layer, **kanumanteémí kalaá akeébá** '"I will do it," he has decided', a Perceptive Clause, plus **kalaá**, is the Quote of the third layer, also a Perceptive Clause. Similarly, the whole third layer plus **oó** is the Quote of the fourth and outermost layer, a Saying Clause.

Transitive Clause	**kanumanteémí** I will do it			
Perceptive Clause	**kanumanteémí kalaá** "I will do it,"	**akeébá** he has decided		
Perceptive Clause	**kanumanteémí kalaá** "He has decided to do it,"	**akeébá kalaá**	**akeebaálíb** you don't know	
Saying Clause	**kanumanteémí kalaá** "You don't know that	**akeébá kalaá** he has decided	**akeebaálíb oó** to do it,"	**akeenalaleé** he said....

NOTES

1. This is the language spoken in the vicinity of Telefomin, Sepik District, New Guinea.

2. This paper represents findings based upon 600 examples of the Quotative Clause found in 120 pages of transcribed text (including a group discussion, a conversation, narratives and discourses on various subjects, sermons and prayers, and involving at least ten different speakers belonging to two generations, two speakers predominating), 60 pages of translated material, and elicited data.

3. A clause occurring as Quote is characterized by the Quotative Marker **oó** or **kalaá** that follows it, in contrast to an included clause within any other clause-level unit, which is obligatorily marked by a following pronoun.

4. In clause types other than the Quotative, the Object is an optional unit.

5. When there is an Associated Clause (see section 3 below), three factors operate to resolve this ambiguity: (a) the verb occurring as Predicate of the Associated Clause (**bákaamin** and a very few others occur in the Saying sub-type, while any verb may occur in the Desiderative); (b) the Subject of the Associated verb is the same as that of **akankalin** in the Saying sub-type, but may be different in the Desiderative; (c) the connective suffix is predominantly **-ileé** for the Saying sub-type, predominantly **-ta** for the Desiderative.

6. A single grammatical feature encompasses a similar wide semantic range in certain other known languages. In the Turkic languages, especially the Central Asian languages such as Uzbek, one construction covers saying, wishing, assuming, purposive, naming, and perceptive (information from S.A. Wurm). Similarly, in Waiwai of British Guiana one construction covers saying, naming, perceptive, and many related concepts (Robert E. Hawk'ns, Waiwai Translation, *Bible Translator* 13.164-171, 1962).

7. The brackets < > around a particular word denote the use of that word to represent the whole syntactic class to which it belongs.

8. The first and second person singular Beneficiaries may occur at the morphological level within the Quotative Clause as a prefix, **na-** and **ka-** respectively, to **akankalin**, forms which in all other prefixable verbs indicate Object. However, where there is no ambiguity the third person and plural form **a-** is used even when the Beneficiary of the Associated Clause is first or second person singular. **na-** and **ka-** therefore occur relatively rarely with **akankalin**.

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A PROBLEM IN BUANG MORPHOLOGY[1]

BRUCE A. HOOLEY

0. The Buang language is spoken by about 7000 people living along the valley of the Snake River in the Morobe District of the Territory of New Guinea. It is divided into three main dialects, of which the central one is represented in this paper. This dialect is spoken in eight or nine villages centering around Mapos, and most of the data used was collected from informants living in Mapos itself, which is situated 25 miles southwest of Lae, at an altitude of 5000'. The material used in this paper was collected over a period of several months while living in Mapos as a member of the Summer Institute of Linguistics.

Buang is a member of the Malayo-Polynesian or Austronesian family of languages, and belongs to that particular sub-section commonly known as Melanesian. Its relationship to other members of the family is clearly seen by comparison of cognates, the pronoun system, and certain grammatical features. Examples of easily recognisable cognates are: **mala** 'eye'; **ama** 'father'; **atë** 'liver'; **bngo** 'cordyline plant (tanket)'.

The results of a traditional phonemic analysis of Buang is to be seen in Table I. Only the consonants are presented here, since, for

TABLE I

Consonant Phonemes:

p	**t**		**k**	**kw**	**kh**
b	**d**	**j**	**g**	**gw**	**gh**
v	**l**	**r**	**x**	**w**	**h**
		s			
m	**n**		**ng**	**ngw**	**ngh**
		y			

the purposes of the following discussion, the vowels are irrelevant. They are shown here in the orthography proposed for the language, but the general phonetic significance of each will be apparent. It should be mentioned, however, that the voiced stops are all prenasalised; that **x** indicates voiced velar fricative, and not voiceless; **h** in each case distinguishes the uvular point of articulation. There is then, a series of voiceless stops at the bilabial, dental, velar, labiovelar and uvular points of articulation. At the same points of articulation there are also, a series of voiced prenasalised stops, of voiced oral

Hooley, B.A. "A Problem in Buang Morphology". In Pence, A., Deibler Jr., E., Healey, P. and Hooley, B. editors, *Papers in New Guinea Linguistics No. 1.* A-3:35-46. Pacific Linguistics, The Australian National University, 1964. DOI:10.15144/PL-A3.35

continuants, and of nasals. In addition, at the alveolar point of articulation, there is contrast between voiceless fricative, voiced prenasalised affricate, flapped vibrant, and semi-vowel.

Turning to the grammatical level, Buang has a sub-class of verbs which show changes in the first consonant of the root correlating with tense change.[2] By no means every verb in the language is affected in this way, but an appreciable number are involved. An example of each type of change is given in Table II.[3]

TABLE II

	Past	*Future*
to cut (a tree)	**vuv**	**buv**
to build	**lev**	**dev**
to pick, pluck	**rur**	**jur**
to crawl	**xevkh**	**gevkh**
to cut, chip	**sap**	**ngap**
to come back	**yom**	**nom**

For verbs whose initial consonant is both oral and velar further changes are encountered of the same type, but in this instance connected with person rather than with tense. Table III shows what

TABLE III

	3rd person (crawl)	*2nd person* (crawl)	*1st person* (crawl)
Past	**xevkh**	**wevkh**	**hevkh**
Future	**gevkh**	**gwevkh**	**ghevkh**

happens with voiced velar consonants where interaction of the changes due to tense and to person takes place.[4] Table V shows that for voiceless velar consonants, only the person changes are involved.

TABLE IV

	(get up) (3rd person)	(get up) (2nd person)	(get up) (1st person)
Past/future	**kdi**	**kwdi**	**khdi**

It is not difficult to understand what is happening since the processes are not particularly complicated. The difficulty comes however when one seeks the best, simplest, and most revealing way of describing the patterns of change. In the following discussion, three different methods of handling the data will be considered.[5]

1. **ITEM ARRANGEMENT**: The first possibility considered follows the lines of the traditional Item-Arrangement analysis and makes simple morpheme cuts. The result is a series of morphemes **-uv** 'to cut'; **-ev** 'to build'; **-ur** 'to pluck'; **-evkh** 'to crawl'; **-ap** 'to cut'; **-om** 'to come back'... representing the verb roots. The past tense morpheme then is described as

v- ~ l- ~ r- ~ x- ~ s- ~ y-

and the future tense morpheme as

b- ~ d- ~ j- ~ g- ~ ng- ~ n-

(assuming the 3rd person form to be basic).

For those verbs with **k**- and with the **x**-/**g**- tense allomorphs, further morphemes of person must be set up:

Second person	**w- ~ gw- ~ kw-**
First person	**h- ~ gh- ~ kh-**

and the co-occurrence of these with tense described:

Past + 2nd person	=	**w-**
Past + 1st person	=	**h-**
Future + 2nd person	=	**gw-**
Future + 1st person	=	**gh-**

This solution is obviously quite complicated, and would necessitate setting up six sub-classes of verbs each of which would have to be listed and marked in some way in the lexicon. Further the description of the allomorphs is quite complex, and the evident phonetic similarity existing between certain of the past/future pairs is completely obscured. An even more serious objection is the following. In the language, there are severe restrictions on the occurrence of vowel initial morpheme. Except for one suffixial morpheme **-in** 'transitivizer', the only vowel which may occur initially is **a**, as in such words as **ata** 'mother'; **ahë** 'stomach'; **axata** 'road'. To set up a number of vowel initial morphemes, as would be required if the above solution were adopted, would violate the observed structure, and disrupt the patterns of the language. For these reasons Solution I is rejected as unsatisfactory.

2. **ITEM PROCESS**: The second possibility for describing the data would be to use a process statement. The past tense forms are regarded as

basic and the future tense morpheme is described in terms of a process of replacement (R).

The roots are then: **vuv** 'to cut'; **lev** 'to build'; **rur** 'to pick'; **xevkh** 'to crawl'; **sap** 'to cut', **yom** 'to come'.

Future tense is then:

vRb ~ lRd ~ rRj ~ xRg ~ sRng ~ yRn

(again regarding 3rd person as basic).

For those verbs beginning with **x-**, and **k-**, person could also be indicated by replacives:

2nd person = **xRw ~ kRkw**

1st person = **xRh ~ kRkh**

As before, the co-occurrences of tense and person would also have to be described:

Future + 2nd person = **gw-**

Future + 1st person = **gh-**

This description has the advantage that the morpheme patterns of the language are preserved by leaving the initial consonants intact as an integral part of the roots. Further, now it is only necessary to list one sub-set of verbs, namely those undergoing the process of replacement. Given this, the actual forms are predicted by the shape of the initial consonant of the root in each case. But this solution is still quite complex, nor does it make the phonological relationship between the pairs of replacives explicit. It is therefore worthwhile considering yet another technique that developed by what is often referred to as the Firthian or Prosodic School.[6] To do this it will be necessary to go back and re-align the data in terms of the different concepts involved.

3 PROSODIC TREATMENT: Firth considered the phoneme as essentially related to and useful for transcription. He believed it to be inadequate for phonological description of language, especially as it tends to hide many phonetic features pertinent to the correct perception of language within allophonic variations of the phonemes. This is illustrated from Buang by the fact that it is much easier to recognize syllable final uvular stops, in contrast to velar, by the offglide from the preceding vowel rather than by the actual phonetic quality of the stops themselves. By phonemic analysis however, it is the stops which are set up as contrastive, and the importance of the different quality of the vowels is obscured since it is described merely in terms of allophonic variation. Firth saw the process of cutting up a continuous stream of speech into so many segmental phonemes as obscuring many extremely relevant features of the speech process. He therefore suggested setting up a different framework altogether for the description of the phonic data of a language. This is not the place to discuss Firth's theories at length;[7] suffice it to say that in order to describe the phonology of a given language he abstracted two features from the observed phonetic data. The first of these was the Phonematic Unit, which may on occasion bear certain similarities to phonemes but are in reality quite distinct. The Phonematic Unit is a segment occupying a serial place only in the system and is described in terms of C and V units. With its substitution possibilities at a given place in the system it correlates with de Saussure's paradigmatic axis. The other feature abstracted by Firth was the Prosody. This has reference to any feature relevant to sequences of items, and since it points up the relationship between items arranged in linear order it correlates with de Saussure's syntagmatic axis. Prosodies sometimes show resemblances to certain of the traditional supra-segmental phonemes since they often describe the same phenomena. There are two types, (a) those having *exponential extension*, i.e. the feature in question extends in its exponency over more than one segment or unit; (b) those having *demarcative function*, i.e. a feature may be allocated to a Prosody with respect to a given structure if the feature while confined in exponency itself to a given place serves to mark off the structure in question. In analysing a given language in terms of Phonematic Units and Prosodies, it is not an *a priori* demand that the analysis be relevant on other levels of description, but if it *is* seen to be significant at other places in the description, such demonstration of larger patterns is desirable, and lends weight to the proposed phonological analysis.

Returning to Buang, one possible analysis of the data in Prosodic terms, is as follows:

Nine phonematic units are set up

p	**t**		**k**
v	**l**	**r**	**x**
		s	
		y	

plus three Prosodies, thus reducing the number of primitives in the system by half. The exponents of the Prosodies are as follows:

1. Prosody of Nasalisation (N).

   (a) With voiceless stops, lowering of the velic throughout the articulation of the segment, accompanied by voicing e.g. $^{N}\mathbf{p} = [\mathbf{m}]$.

   (b) With voiceless fricatives, oral closure at the velar point of articulation, and lowering of the velic throughout the articulation of the segment, accompanied by voicing: $^{N}\mathbf{s} = [\mathbf{ng}]$.

   (c) With the semivowel, oral closure at the dental point of articulation and lowering of the velic throughout the articulation of the segment $^{N}\mathbf{y}$ = [ŋ].

(d) With the oral continuants, oral closure at the point of greatest oral stricture in the mouth, accompanied by lowering of the velic, followed by raising of the velic prior to the release of closure, e.g. $^{N}\mathbf{l}$ = [ⁿd].

2. Prosody of Labialisation (L), with velar segments.

(a) Rounding of the lips prior to the release of a stop, merging into the articulation of the following V unit: $^{L}\mathbf{k}$ = [kʷ].

(b) Rounding of the lips throughout the articulation of the fricative segment, with accompanying diminution in the degree of velar stricture $^{L}\mathbf{x}$ = [w].

3. Prosody of Backing (B), with velar segments.

Retraction of the point of articulation from velar to uvular position throughout the articulation of the unit, e.g. $^{B}\mathbf{x}$ = [ʁ̞]

It will be seen that the Prosody of nasalisation affects all the units in one way or another. It is also interesting that the operation of this Prosody on the units **t** and **y** produces the same phonetic result in each case, and likewise for **k** and **s**. By contrast the Prosodies of labialisation and backing operate only on units at the velar point of articulation.

4. CONCLUSION: The beauty of this treatment is revealed when the tense changes are examined again, because it now becomes clear that for this sub-class of verbs both tense and person changes may be described in terms of the Prosodies set up. Future tense is equivalent to the addition of the Prosody of nasalisation to the particular Phonematic Unit which occurs initially in the root. Second person is likewise equivalent to labialisation, and first person to backing. Thus it not only handles the material with considerable reduction in the number of primitives required and without the need to describe a considerable number of allomorphs, but it brings out the relationships between the individual past/future correlates. That is, it shows clearly the relationships of the phonetic features involved in the tense change, which by traditional analysis would be entities at a sub-phonemic level. It also shows up the overall unity and pattern of the system which was obscured in the other descriptions.

Finally, it is probable, at least for the nasalisation Prosody, that this matches up with the historical facts and represents the remains of the nasal future prefix of Austronesian.[8]

NOTES

1. An earlier version of this paper was read at the December 1962 meeting of the Linguistic Society of America in New York.

2. The writer is grateful to A. Capell for drawing his attention to the occurrence of similar phenomena occurring on the island of Ebi in the Central New Hebrides and noted by Dempwolff in "Austronesisches Sprachgut in den Melanesischen Sprachen" *Folia Ethno-glossica* April-Dec. 1927, p.41. It would seem, however, that in the New Hebrides languages the nasalisation is connected with non-future rather than future tense and the system does not seem to apply so consistently as in Buang.

3. One change is not illustrated here, namely, **yev/jev** 'to weed, clear ground (Past/Future)', but only one example of this change has so far been found. This is difficult to explain by any of the descriptions proposed, but would be the expected correlation if **y** functioned as a member of the oral continuant series.

4. A further sub-group of verbs occurs with a prefix which shows this same type of change, e.g.

kho - 'to bring, carry'

gkho	- '3rd person future'	**xkho**	'3rd person past'
gwkho	- '2nd person future'	**wkho**	'2nd person past'
ghkho	- '1st person future'	**hkho**	'1st person past'

These forms require further study however, and since they do not add to the point being made in this paper they have been omitted from the discussion.

5. At least two other possibilities might have been considered, namely, introduction of the concept of simulfixation as described by E. Wallis, "Simulfixation in Aspect Markers of Mesquital Otomi" *Language* 32. Alternatively the concept of distinctive features as developed by R. Jakobson and M. Halle could have been used. (*Fundamentals of Language*, Mouton 1956; see also R. Jakobson, C.G.M. Faut, M. Halle, *Preliminaries to Speech Analysis*, Accoustics Laboratory, Massachussetts Institute of Technology, Technical Report 13, 1952). The first of these techniques seems to be similar to Prosodic Analysis in its ability to handle the data, while it was not practicable to launch into any extensive analysis of the second type at this time.

6. The writer is indebted to J. Bendor-Samuel and R.H. Robins for helpful suggestions regarding the application of Prosodic analysis to the present problem.

7. A detailed bibliography of writings in Prosodic terms may be found

in J. Bursill-Hall, "Levels Analysis - Firth's Theory of Linguistic Analysis - Firth's Theory of Linguistic Analysis" *Journal Canadian Linguistic Association* 6, Nos. 2 and 3, 1960, 1961.

8. The possibilities which this feature has for internal reconstruction in Buang was first drawn to my attention by Warren C. Cowgill.

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