This dissertation has been
microfilmed exactly as received 67-10,706

I'OUGHT, John Guy, 1938-
CHORTI (MAYAN): PHONOLOGY, MORPHOPHONEMICS, AND MORPHOLOGY.

Yale University, Ph.D., 1967
Language and Literature, linguistics

University Microfilms, Inc., Ann Arbor, Michigan

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

© Copyright by

JOHN GUY FOUGHT

1967

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

CHORTI (MAYAN)

Phonology, Morphophonemics, and Morphology

John Guy Fought

1967

A Dissertation Presented to the Faculty

of the Graduate School of Yale University

in Candidacy for the Degree of Doctor of Philosophy.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Summary

This dissertation is a descriptive study of Chortí, a Mayan language of Guatemala, consisting of a componential analysis of the phonological system, an outline of the phonotactics, a description of the patterns of morphophonemic and morpholexical alternations of the shapes of morphemes, and an outline of the morphological and syntactic categories of the language, with lists and examples of the morphemes and morpholexical alternants in the various categories.

A brief text is given in morphophonemic and phonemic transcription, with a translation and commentary.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Acknowledgements

My research on the Chortí language has been supported by the National Science Foundation, and directed by Professor Floyd G. Lounsbury. His encouragement and advice have been of great help at every stage of this work.

The Chortí people kindly and patiently worked with me, often interrupting their own work. I am particularly indebted to Isidro González, Pedro Ramírez R., Juan Quizar, and Ismael León.

The kindness of the Friends' Mission in Guatemala made my work there easier and more pleasant than it would otherwise have been. I am grateful to the Reverend and Mrs. John Astleford, and to the Reverend and Mrs. John McNichols for their assistance, and to Mr. and Mrs. Homer Sharpless for their hospitality.

My wife has shared in the work of this project from the first field session to the final typing of the manuscript.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Table of Contents

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

0. General Introduction

Chortí is a Mayan language spoken by some 20,000 persons in the state of Chiquimula, in eastern Guatemala. Most of these speakers live on the slopes surrounding the town of Jocotán. A few thousand live in the municipios of Olopa, to the south of Jocotán, and La Unión, to the north. A few dozen live on the eastern border of Guatemala in the municipio of Camotán. These few speak a dialect which is quite different from that of the inhabitants of the first three municipios.

The dialect described here is that of Pelillo Negro and Guareruche, two villages of Jocotán. There are noticeable differences in the phonotactics and morphophonemics of adult speakers from both villages, but no geographical pattern is apparent to me.

My principal informant, Sr. Isidro González, was born in Pelillo in 1926 and lived there until 1960, when he moved to Jocotán. I frequently consulted others, especially Sr. Pedro Ramírez R. and Sr. Ismael León of Guareruche, and Sr. Juan Quizar of Pelillo.

I collected a corpus of tape-recorded texts and ancillary material during two field sessions in Guatemala, from June to September of 1964 and from July to November of 1965, and during the period from September to December of 1964, when Sr. González was employed in New Haven.

The presence of loanwords in considerable number and frequency, mostly from Spanish, raises a question of policy.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

I follow Bloch in choosing to exclude nothing from the corpus: 'All the details that make up a language have an equal claim to be used as evidence for the system; whatever occurs in the utterances of those who speak the language is for that reason a part of the total structure. The question how to treat loan-words can have only one answer: treat them as words.[1]

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Descriptive Approach

My approach to descriptive linguistics conforms to the system of postulates and definitions developed by Bernard Bloch. When last presented to his students, the system was more general than the published version of 1948, and very much more concise. Its generality allows a user to make numerous adaptations and innovations of technique while remaining within the limits of the system of assumptions so carefully designed by Bloch.

Bloch's phonological work rested on two basic assumptions. First: 'Every language has a phonological structure independent of its morphological and semantic structure, and this phonetic structure is worth investigating for its own sake.' Second: 'Phonology has nothing to do with meaning; the analytical method should be entirely independent of semantic criteria. If one starts from a sufficiently large corpus, recorded in sufficient detail, all that must be known is that everything means <u>something</u>.'[2] I accept the first of these, which could be called the <u>independence assumption</u>, but not the second.

It is now recognised that in place of a professedly strict distributional approach, linguists actually used a distributionalist terminology applied to elements established on partly semantic evidence.[3] It is not, then, too surprising that the postulates, here in their still-tentative version of 1964, are so well adapted to the growing interest in and capacity for the incorporation of semantic structure into linguistic descriptions. It is now possible to accept Bloomfield's fundamental assumption

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

of linguistics with more optimism and greater effect. In place of Bloch's second basic assumption, then, I assume that 'in every speech-community some utterances are alike in form and meaning.'[4] A corollary of this assumption is that some utterances are different in form and meaning. The relation upon which the linguist relies throughout the course of his analysis is contrast: utterances contrast which differ in one or more features of form and one or more features of meaning. A close reading of Bloch's Postulate 3, given below, will show that it is consistent with and complementary to the definition just given. I choose, therefore, to adapt Bloch's postulates by recognizing the validity as well as the expediency of direct appeals to the semantic features of utterances.

Bloch's style is especially compact in the postulates. Because they are of great help in understanding certain points, I give some of his classroom remarks, within parentheses. My own remarks are given within brackets. The text of the postulates, definitions, and corollaries is that of 1964.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

0.1 Postulates for Descriptive Linguistics

Preliminary Definitions

An utterance is an act of speech between successive respirations of a speaker.

An element is any fraction, component, or attribute of an utterance, or any combination or class of these, in terms of which the utterance or any part of it can be described, identified, or distinguished from other utterances or parts.

A feature of an element E is any element contained or included in E.

The environment or an element in a given utterance is the whole utterance except for the element itself.

An element is predictable in a given environment if the environment does not occur without the element. [Otherwise the element is unpredictable in the given environment. This very strict sense of predictability is of the greatest importance to the system, in view of the definition of 'environment' just above, taking in the entire utterance, and the use made of 'unpredictability' in Postulate 2 below.]

The distribution of an element is the totality of its environments.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Postulates

1. Discreteness. Linguistic elements are the same or different.

Corollary: Elements which are neither the same nor different, but gradient, are not linguistic. [Amplitude as a concomitant of stress is linguistic, but when used for emphasis it is not.]

Definition: Elements which the analyst cannot discriminate are the same. [If the analyst fails to perceive a distinction made by his informants, his description will be that much less accurate, and so, worse than it would otherwise be. At the same time, Bloch believed that a trained linguist, working without instruments, could reasonably expect to learn to perceive all the distinctions his informants were actually making.]

2. Relevance. Linguistic elements occur in some environments unpredictably.

Corollary: An element that is predictable in every occurrence is not linguistic. [Individual voice qualities, for example, are not linguistic.]

Definition: Henceforth the term element will denote a linguistic element only. [The above does not mean that elements occur in all environments unpredictably: / æ / is unpredictable in cat, predictable in sassafras. A linguistic element is relevant in everyenvironment where it occurs, whether it is predictable in some of them or not. This is explicitly stated in the last definition under Postulate 3.]

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

3. Contrast. Some sets of elements occur unpredictably in the same environment. [Taken as whole utterances, such a pair as It's a cat and It's a cot fit the definition of contrast I gave above. Taken as environments of commutable elements, such as [ae] and [a], or of the features of meaning of cat and cot, they fit the postulate as given here.]

Definition: Such a set is a contrastive set.

Definition: Elements in such a set contrast, or are contrastive with each other.

Definition: Elements that do not belong to the same set of this kind do not contrast.

Corollary: Every element belongs to at least one contrastive set. (Every element is contrastive in some occurrences, since if it does not contrast with another element, it occurs in contrast with its own absence.

Definition: Elements that contrast in any environment contrast in every environment where any of them occurs. [This definition precludes archiphonemes, since elements which contrast in some environments -- one or more -- contrast even in those environments where only one of the contrastive set occurs. Neutralization is thereby rejected in favor of defective distribution.]

4. Isomerism. Some sets of elements share a feature absent from all others.

Definition: Such a set is isomeric.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Definition: Taken all together, the members of an isomeric set are isomeric with each other. [Bloch refused to use either negative or disjunctive definitions in connection with isomeric sets. He regarded this preference as a convention, rather than an integral part of the postulational system.]

Corollary: Some isomeric sets have only one member. [For example, the set of lateral sounds, isomeric by virtue of laterality, has only one member in English.]

Corollary: Some subsets of some isomeric sets are not isomeric. [No subset of / m n ŋ / is isomeric. A subset is isomeric only if it is itself an isomeric set defined by some other feature. Isomeric sets, as defined by this postulate, are sets of <u>all</u> elements sharing a feature.]

Corollary: Every element belongs to at least one isomeric set.

5. <u>Equivalence</u>. Elements that are isomeric and non-contrastive with each other are the same.

Definition: The class of all elements that are isomeric and non-contrastive with a given element is an equivalence class. (The class of all elements that are isomeric and non-contrastive with a given 'sound' is an equivalence class called 'phoneme'.) [Bloch's definition of 'equivalence class' sets his approach apart from those which rely on a later accomodation of solutions through 'reanalysis', whether for 'tactical convenience', 'morphophonemic simplicity' or the like. It expressly prohibits the assignment of rare or distributionally limited elements to an

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

equivalence class with conveniently defective distribution unless there is also genuine isomerism of form.]

6. Freedom. Every element occurs in different environments.

Corollary: What occurs in only one environment is not linguistic. (Examples of this are hard to find, and may not actually exist, but it is necessary to guard against them.)

Corollary: A sound that never combines with other sounds is non-linguistic. (You sneeze when you have to sneeze, not after initial t.)

7. Patterning. Different elements differ in distribution.

Corollary: Elements with the same distribution are the same. [This accounts for 'so-called free variation'. When different sounds replace each other without rhyme or reason, and the sounds both occur in all environments where one occurs, they are the same.]

8. Redundancy. Every element is excluded from some environments. [There are two kinds of exclusion: exclusion by rule — / s / occurs freely, but not between / š / and / r / — and de facto exclusion — all elements but those in sassafras are excluded from this environment.]

Corollary: What is not excluded from any environment is not linguistic.

Corollary: Not all combinations of elements occur.

[The acceptance of redundancy without qualification in

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

this way is perhaps the most strikingly different aspect of Bloch's approach. It has important consequences in the phonology, both for the determination of distinctive features and for the phonotactics. In addition, it obviates the use of zero elements, since there is no need to regularize the distribution of elements by the use of zeros. Some of the consequences of zero-free morphology will be illustrated in the last chapter of this study.]

The system of postulates just presented is obviously not a discovery procedure in any sense, nor was it intended to be. Bloch's only procedural advice to his students was that they refrain from accepting any alternative of an arbitrary choice. He was concerned instead with the evaluation of solutions. If the elements and relations of a solution conformed to the postulates, yet were surprising or unsatisfying for some reason, or if, as he put it in class, 'we get into a position where we don't want to be, and can't find any flaw in our reasoning, then we'd better examine our conscience and see why we don't want to be there.' The examination should lead to more data, to a change in the assumptions underlying the results, or to an acceptance of the results.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Footnotes

[1]Bernard Bloch, 'Studies in colloquial Japanese IV: Phonemics', Lg. 26.87 (1950).

[2]In the wording of the assumptions, postulates, and comments, I follow lecture notes taken in 1963 and 1964 by Sarah Fought.

[3]The summary of linguists' views on meaning in C. C. Fries, 'Meaning and linguistic analysis', Lg. 30.57-68 (1954), is still useful.

[4]Leonard Bloomfield, Language 78 (New York, 1933).

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

1. Introduction to the Phonology

Phonological descriptions of a given language differ in (1) the corpus of phonetic observations, (2) the abstract theory of phonology, (3) the conventions by which the terms of observation and theory are related to each other and to (4) the symbols of an orthography. Often the relations and limits of these factors are left unspecified, making it difficult to separate theory from orthography, particularly when superficial agreement in terminology masks the underlying differences of approach.

By carefully distinguishing abstract linguistic elements from their orthographic representation, a more effective solution may be found to the problems of each. 'The task of phonemic analysis, in the narrowest sense', wrote Hockett, 'then becomes: (1) to determine the set of independent or only partially dependent features of articulation or of sound which are found in a language, and (2) to determine the arrangements — either linear or otherwise — in which these features occur in utterances. Linear or almost linear orthographies are a matter of extreme convenience, and certainly it is safe to say that such a notation is always possible; but the task of devising orthographies is not part of phonemics in the narrowest sense.'[1]

Orthographies may be classified according to the relative proportion of time-segment symbols to quality-span symbols, or more simply, of segments to components. We may speak of segmental or alphabetic notations when these symbols predominate,

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

or of componential notations when components outnumber segments. In a mixed notation there are both segment and component symbols.

A survey of phonological descriptions will show, first, that mixed notations are inconsistent in their treatment of some phonetic feature, and thus, insofar as they reflect faithfully an underlying theory or represent the linguistic elements term for term, they are unsatisfactory; and second, that it is both desirable and possible to exploit the convenience of a linear, segmental notation without sacrificing the consistency attained in a componential solution.

In the following discussion, I have assumed that when there is no clear evidence to the contrary, a notation does represent a solution directly. While many of my remarks focus on the notation, they also apply to that extent to the underlying theories as well.

1.1 The Alphabetic Tradition

The older tradition of phonetic description and phonemic analysis is based on an alphabetic notation which incorporates a number of well-known inconsistencies, both internal and external. Nasalization in French, for example, in sets of forms like bas 'low', mât 'mast', banc 'bench', and ment 'lies', could be represented consistently as a diacritic in all cases, as in (1) below, or by a separate letter symbol, as in (2), but because of the traditional categories and habitual usages of the Latin alphabet and its descendents, the inconsistent transcription in (3) is

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

preferred, while the equally inconsistent (4) is not used by anyone:

(1)	b̃a	b̃a	bã	b̃ã
(2)	ba	ma	b&	m&
(3)	ba	ma	bã	mã
(4)	ba	b̃a	b&	b̃&

It may be objected that since an explicit convention specifying that the letter and diacritic are a unit or single symbol will convert a type (1), (3), or (4) solution to the linear type (2), all this discussion is just vain quibbling over symbols. But my point is merely that such an explicit convention <u>is</u> required to settle the status of letter and diacritic, and that the reasons for this need are ultimately historical, and so, extraneous to phonetic or phonological description.

It has been suggested that solution (3), the familiar solution, is preferable in French for morphophonemic reasons. More economical descriptions of morphophonemic alternants are made possible through the use of a nasality element separate from the vowel than are possible with a set of integral nasalized vowel letters. In this view, the nasality of consonants is phonologically different from the nasality of vowels, even if the two are phonetically the same. The theoretical complications arising from this partial intersection, of [~] in /~, m, n, ñ/, are tolerated for the sake of the gain in morphophonemic convenience.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

This view confirms my argument. A convention on the status of letter and diacritic is still required, of course.

The force of tradition may be better appreciated when it is realized that a solution of type (1), which extracts the nasality component from both consonants and vowels, offers all the morphophonemic convenience of type (3) without the serious difficulty of intersection. Yet, no one seriously proposes to deal with French phonology by a type (1) solution: it is simply too barbarous, and type (3) too familiar, for there to be any hesitation.

There is another tendency, however, to approximate a linear notation more closely by a convention transforming a type (3) notation into one of type (2). 'With the development of modern linguistics and the explicit formulation of the phonemic principle,' Hockett wrote, 'this long-standing habit of visual representation has taken the shape of an unstated linearity assumption: the distinctive sound units or phonemes of a language are building blocks which occur in a row, never one on top of another or overlapping. This assumption has been lifted in certain patent cases: features of stress or tone, for example, which normally stretch over more than a single vowel or consonant, have been called non-linear or suprasegmental, in contrast to the linear or segmental vowels and consonants.'[2] But often, several features overlap and span several segments, and the choice of one or a few of these as nonlinear is ultimately a matter of convention and historical development in the transcription system. In an

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

English form, bedspread for example, we are used to writing stresses as suprasegmentals, and employing segmental letters paired in voiced / voiceless distinctions. We might instead abstract a suprasegmental component of voice, and another of voicelessness, marked perhaps by $\underline{\overset{v}{\ }}$ and $\underline{\overset{\Lambda}{\ }}$, and note stress differences by using upper case for primary and lower case for tertiary stresses. The familiar practice is (5) below, while suprasegmental voice and segmental stress are shown in (6). In (7) both stress and voice are suprasegmentals and in (8), neither is:

(5) / ˈbed + ˋspred /

(6) / ^{v}PET + $^{\Lambda}$sp^{v}ret /

(7) / ˈ^{v}pet + ˋ$^{\Lambda}$sp^{v}ret /

(8) / BED + spred /

Each of these four transcriptions represents the same form, but only (8) is linear, and this notation makes provision for only two stresses and no pitches. If it were modified to accommodate four degrees of stress and four of pitch, supplying a different symbol for each of the possible stress + pitch + segmental permutations recognized for a common American English dialect, the inventory of symbols would be eight times larger still, and sixteen times the list of segmentals alone. For a phonological system of this kind, then, a strictly linear notation is undesirably cumbersome in use, though possible and internally consistent in a way that mixed systems are not. Instead of a segmental system, a mixed system is used in which selected features are abstracted

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

for the sake of practical convenience.

1.2 The Componential Approach

In many linguistic descriptions, the phones or phonemes are displayed in the rows and columns of a phonetic chart, for example,

(9)
p	t	k
p'	t'	k'
s	š.	

'In discussing this chart,' Voegelin wrote, 'the second row would be described as a glottalized "series", as though a distinctive feature or component were added to each corresponding plain stop in the series on the first row. This part of the traditional analysis is reflected in our use of additive components which turn out to be applicable in differentiating "series" as above, where the additive component (glottalization) is phonetically in close juxtaposition; and also, as below, where such additive components as stress and nasalization and voicing are phonetically simultaneous.'[3] It is not clear whether he is referring to the written diacritic or the phonological component of glottalization when he speaks of 'close juxtaposition'.

Voegelin transcribes utterances as strings of unit phonemes in his system. This third element means, in his example, that 'at least one allophone of the class of the / i / phoneme combines with nasalization... that is, the allophone of the resulting unit phoneme / i̧ / might be [i̧] only, and not also [ɪ̧].'[4] Some

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

unit phonemes, then, are made up of a linear phoneme alone, while others contain a linear phoneme and one or more additive components. Taken simply as an exploitation of the rows and columns of a phonetic chart, the proposal is strikingly like Hockett's practice in the typological portion of his Manual of Phonology.[5]

Viewed in this light, then, Voegelin's proposal is simply a partially componential solution of the familiar sort: all but stress and pitch features are assigned to segmental units.

If taken at face value, however, Voegelin's system, and to some extent Hockett's as well, represent an extension of the componential principle. By using a single row of segments and successive rows or parts of rows generated from these by the addition of components, it would be possible to arrive at partially segmental solutions of phonological systems. In practice, both writers stop well short of this, however. None of the ten languages surveyed by Voegelin has more than two additive components in the consonant system, whereas the number of linear consonants ranges from eleven in Chatino to twenty in Chipewyan. There are more linear phonemes than might be expected because of Voegelin's treatment of stop plus spirant clusters as unit affricates, each spirant type requiring a separate 'position' or column in his charts. In his Chipewyan solution, there are 26 linear phonemes and 8 additive components, occurring in 101 unit phonemes, of which 49 are consonants and 52 are syllabics. Admittedly, the number of elements is just one measure of a solution. It is nevertheless instructive to consider the variation

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

in Chipewyan inventory as one or another solution is used. Voegelin reduces 101 segments to a mixed solution, which we will note (26 + 8). It is easy to reduce the inventory still further by limiting the segment size to a single segment, so that Voegelin's affricates and glottalized stops are transcribed as clusters of two, and his glottalized affricates as clusters of three. Similarly, his long vowels are transcribed as geminates, to parallel a set of diphthongs in -i which he does not mention. In this way the 101 segments are reduced to 36. If this method is applied in conjunction with the additive component approach, a still greater reduction is achieved. This solution is shown below, with 15 linear phonemes and 6 additive components:

Linear:	b	d	g	ð	z	ž*		?	h	y	w	l	r	i	u
+ Vl.		t	k	θ	s	š	x								
+ nasal	m	n												ĩ	ũ
+ mid														e	o
+ low														ɛ	a
+ nasal														ɛ̃	ã
+ high pitch for all vowels:														í	ú
														é	ó
														ɛ́	á
														ɛ̃́	ã́

Voegelin provides that a feature appearing at more than two positions, or numbered columns, is to be abstracted as an additive component. He abstracts voice in Chipewyan by this criterion, even though it forces him to use a dummy linear phoneme / p* /

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

which never occurs without voice. I abstracted voicelessness instead, which requires a similar dummy / ž* /. Worse still, the two position criterion, if applied methodically, will lead to both voice and voicelessness components, and so on until only the numbered positions remain. It leads, that is, to a fully componential solution, and not at all to a mixed system.[6]

Only by choosing a fully componential solution, and thereby eliminating segmental phonemes altogether, can we eliminate the indeterminacies in the length and constitution of these segments. These difficulties remain as serious today as they were when Chao wrote that 'it is not our purpose here to propose purely for the pleasure of perversity either to under-analyze two or more piece sounds and treat them as single phonemes or to over-analyze one piece sounds and treat them as successions of phonemes, nor purposely to write something where there is nothing to write, or to write nothing where there is something to write. We wish only to indicate that all such tricks are actually being done in current transcriptions, and that according to the way in which we treat the time unit of phonemes in a language we may arrive at one or another of various possible solutions for that language.'[7]

The selection of a componential approach is neither intended nor claimed to guarantee unique solutions. Fully componential solutions are spared only those serious difficulties pointed out above, in discussing questions of segmentation. The variables which remain are those which are present no matter what phonological

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

approach is selected: a description of the phonetic facts, and a protocol of assumptions, conventions, and procedures by which speech is analyzed as phonology. That is, a phonetic description and a phonological theory are required in any case.

1.3 Fully Componential Solutions

Before presenting the componential approach chosen here for use on Chortí, it will be useful to survey a few current questions associated with the use of components, distinctive features, and other nonsegmental descriptive units. The wide variation in theory underlying the approach demands some attention. As Harris said, 'no new methods or postulates are... required to extend the analysis of simultaneous components to all the phonemes of a language'. In this same connection, he noted that 'this operation involves us in no theoretical difficulties. It does not prevent us from having a statable physical character for our linguistic elements....'[8] Indeed, componential and segmental solutions show parallel variations in their theoretical foundations. For instance, 'we must bear in mind that there are many different ways in which any elements can be broken down into sub-elements. There are a great many ways in which components -- various numbers of them and variously grouped -- can be arranged so that every combination of components recognized in the arrangement will yield a particular phoneme.'[9]

The analytic strategy Harris prescribes in his 1951 book is indeed the same for both phonemes and components. On phonemes:

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

'The operations of [Chapters] 7-9 are designed to reduce the number of linguistic elements for a given language, and to obtain elements whose freedom of occurrence in respect to each other was less restricted.'[10] On components: 'This procedure breaks the usual phonemes up into long components so as to yield new phonologic elements, fewer in number and less restricted in distribution.'[11]

By his own standards of number and distribution, the componential solution is preferable. Yet throughout the chapter which begins with the sentence just quoted, Harris treats components as a useful and compact mode of expression for the phoneme, which he appears to regard as the ultimate or fundamental phonological constituent.[12] I take the opposite view, that the phonological features are the ultimate constituent elements of the phonological system of a language; and that the phoneme, therefore, is a construction or constitute of those features.

Harris assumes that the distributional relations, rather than the shape or substance of a linguistic element, are the descriptively relevant aspects of that element.[13] Similarities of distributional pattern are therefore as important in his system as are similarities of phonetic substance to the feature analysis of the Prague school.[14] In my view, on the other hand, phonological structure, always of whole utterances, is a matter of significant phonetic similarities and differences. Phonological elements so defined have a distribution, and jointly make up a system, but I make no limiting assumptions about the nature of

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

the system or the distributional properties of the elements. Most particularly, I do not assume that either a phonological system or any solution of it must reach any particular level of efficiency as a code. Harris does make such an assumption when he prescribes that all combinations of components occur, or as nearly all as possible, although, as he notes, '... it is almost impossible for all sequences of all simultaneous combinations of all the elements (in all degrees of repetition) to occur, in any language.' Harris does not explore the implications of this, or of the remark that follows: 'If we need say nothing more than that every utterance consists of some non-contour elements and some contour elements, we have already a statement of limitations.'[15]

Jakobson and Halle, like Harris, view their components as a code for phonemes, rather than as a code for utterances. They make an even stronger assumption about efficiency than Harris: their features are to constitute an optimal code: 'The totality of these features is the minimum number of binary selections necessary for the specification of the phoneme. In reducing the phonemic information contained in the sequence to the smallest number of alternatives, we find the most economical and consequently the optimal solution: the minimum number of the simplest operations that would suffice to encode and decode the whole message. When analyzing a given language into its ultimate constituents, we seek the smallest set of distinctive oppositions which allow the identification of each phoneme in the messages

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

framed in this language. This task requires an isolation of distinctive features from concurrent or adjoining redundant features.'[17]

This approach, of course, is radically different from mine. In particular, the requirement that redundant features be isolated from distinctive features will not be imposed here. On this issue my view is like that of Bar-Hillel, who wrote of an allophone S whose characteristic set of features was redundant, that 'it makes sense to say that the feature set [A, B, C, D, E] characterizing S is redundant to a certain degree under any conditions and in any environment, and to an even stronger degree under certain specific conditions or in certain specific environments. So far it makes no sense to single out the feature D rather than E as being the absolutely redundant feature, or to single out B, rather than C, as being a conditionally redundant feature.'[18]

The required binary base of Jakobson's features is also intended to increase the coding efficiency and decrease thereby any redundant information content. Pavle Ivić, a well-informed and sympathetic observer of Jakobson's phonological theory, observed that 'Jakobson's requirement that the D[istinctive] F[eatures] be binary has a double foundation: the fact that in most cases they evidently are binary, and the circumstance that a binary representation of DF is the most economical and most suitable for further operation.'[19] Of the three claims made, it is the first which is crucial: that binariness is a fact 'in most cases'. Ivić goes on: 'Instances of undoubted binariness

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

of DF are based on the privative nature of many phonological oppositions, especially those connected with accessory work of articulatory organs, and, in a broader framework, on the principle of economy in the pattern.'[20] The frequency of Jakobson's recourse to Occam's razor is striking.

In a typical case of privative opposition and 'undoubted binariness', the voiced / voiceless feature, Jakobson wrote as follows: 'The phoneticians have ascertained that the emission of consonants presents an infinity of degrees and shades with regard to the participation of voice: the glottis can be closed to a greater or lesser degree; the vibrations of the vocal cords can be of different amplitude; and the phase at which they begin or cease can vary. Thus, the glottis is capable of producing diverse nuances in the matter of consonantal voicing, but only the opposition "presence vs. absence of voicing" is utilized to differentiate word meanings.'[21] It is obvious from the wording that Jakobson approached the problem with his solution already formulated: that the 'participation of voice' is the marked term in an opposition. The adversative 'but' which introduces his conclusion shows that it does not follow from his description of the phonetics. On the contrary, such a continuum of periodic vibrations suggests that the ordinary language of 'voice' and 'voicelessness' is an inadequate foundation for a general phonetic statement. Furthermore, the physiological facts, so far as they are known, and their acoustic correlates, do not support the view that 'voice', in the ordinary sense, is 'voicelessness'

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

with something added.

The issue is not what phenomena can reasonably be grouped under either term of the binary opposition voice / voicelessness, but, first, whether the opposition and its marker are an adequate description of the physiological and acoustic phenomena, and second, whether this opposition is as claimed, fundamental or inherent in language. Both parts of this question will be taken up below, with reference to Chortí. Briefly, the answer to each is an emphatic no.

If Jakobson's contention that binary features are inherent is not confirmed by observation, it seems fair to characterize it as a vision rather than an inference. Jakobson and Halle allow that one feature, 'compact / diffuse often presents a higher number of terms',[22] yet on the next page they reveal that 'the application of the dichotomous scale makes the stratified structure of phonemic patterns, their governing laws of implication, and the conclusive typology of languages so transparent that the inherence of this scale in the linguistic system is quite manifest.'[23]

Ivić, among others, prefers not to binarize in certain other dimensions: 'This applies first of all to degrees of aperture and to places of articulation. In such cases, the binary analysis is not obvious from the material itself, but is rather a result of abstraction.'[24] In my view, the requirement of binary features, like Harris's requirement of free combinability, is an unwarranted imposition. If some features exhibit either property, well and

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

goal, but this does not justify requiring such properties be characteristic of all features.

One kind of fully componential solution is very much like Voegelin's partially componential approach. Consider the consonantal components used in Martin's 'Korean Phonemics':[25]

(11)

Labial Closure	P
Dental Closure	T
Alveolar or Prepalatal Affrication	C
Sibilance	S
Velar Closure	K
Heavy Aspiration	H
Glottal Tension	Q
Nasality	N
Lateral Opening	L

Martin notes that H and Q always overlap two segments, and therefore constitute separate phonemes according to the protocol given in his paper. The consonant chart is:

(12)

	P	T	C	S	K	-
-	p	t	c	s	k	#
H	ph	th	ch		kh	h
Q	pq	tq	cq	sq	kq	
N	m	n			ŋ	
L		l				

As in Voegelin's proposal, there is a top row of 'linear phonemes',

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

here composed of a single feature, and other derived composite rows. Again, as in Voegelin's system, there are two parts to the definition of the top row of features: the specifications of closure and of articulator. For Martin, unlike Voegelin, the / p / phoneme is not a different kind of thing — a linear phoneme — from the / m / phoneme. Both are bundles of features in Martin's solution, and the / p / happens to be a bundle of one feature, P, while / m / is a bundle of two, PN. This is what distinguishes the fully componential solution of Martin's Korean data from my restatement of Chipewyan, in figure (10) above.

Martin's definitions of components, in (11), do raise a serious question, however, which he does not answer. Hockett provided some discussion of the question whether P is 'further analyzable into a feature of labial position and one of stop closure' in his Sierra Popoluca article: 'It is apparent that with this further breakup we have shifted our logical grounds. In our earlier statement, the three phonemes / t d n / contain a component t which is identically the same in the three cases — the same motion or position of the same flexible part of the speech tract against the same inflexible part thereof. The O of / t d / is likewise identically the same in the two, and the V in / d n /. But when we extract 'smaller' constituents, a t = dental position, a T = oral stop closure, and so forth, what we are saying is that in, for example

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

/ p t / =	p	t
	T	T
	O	O
	H	H

the similarity in kind of motion and position of the lips in the first case, of the tongue-tip in the second, constitutes a separable feature.'[26] Hockett's distinction is spurious: if feature T is 'oral stop closure', it is the same, and not just similar in / p / and / t /. There is no reference to articulator or motion in the feature T, and none to motion or position in the p and t features. Hockett seems to have reapplied his old definitions. In fact, the consistent and exhaustive application of the same procedures of analysis and contrastive comparison of utterances which led Hockett and Martin to break / m / into two components PN would have led them to break / p /, and therefore P, into pT.

Comparably analytic definitions of components are used in Bloch's Japanese phonology, where the approach is very similar in spirit to Jespersen's analphabetic notation.[27] Bloch uses position of articulation and aperture as dimensions:

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Position		Aperture	
L	labial	1	closure
D	dental or alveolar	2	affrication
P	prepalatal	3	constriction
F	prevelar	4	flap
B	mediovelar	5	small
G	glottal	6	medium
		7	wide

Of these, aperture 2 is of questionable standing, since Bloch's reasons for regarding affricates as units — homorganic and unit-time articulation — do seem to apply just as well to alveolars plus [y], in spite of his explicit statement to the contrary. The issue here, I believe, is one of general phonetics rather than specifically Japanese phonemics. My solution will be more like Bloch's later work on English, where affricates were not established as units, but instead as clusters of stop plus spirant.

There are, in addition, three components of a different order: N, nasalization, V, voicing, and Q, syllabic quantity, which are of no importance here, since N is as easily treated as a velic aperture, and V as a glottal aperture. Q has no relevance to Chortí.

With these reservations, the approach to phonological description to be followed here will be very similar to Bloch's. Instead of positions of articulation, I will use the active articulators as one axis of phonetic measurement.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Phonological elements and constitutes, of course, conform to the postulates and definitions set forth in the general introduction. In addition to these general properties, certain special terms and relationships are required for the phonological discussion to follow, in parts 2, 3, and 4.

A component is any phonetic feature.

A relevant component (see postulate 2) is determinant where it occurs unpredictably, and determined where it occurs predictably. A component which is predictable in every occurrence is conditioned, and not relevant.

A change point is the moment of transition from one component, or none, to another component.

A span is a fraction of an utterance coextensive with a given component. A segment is a fraction of an utterance between successive change points.

Having established an inventory of components which reflect on the one hand the phonetic and semantic data of the corpus, and on the other hand, the theoretical structure of the general postulates and the special definitions just enumerated, it will then remain only to state the combinations of elements and the conventions by which they are to be represented in an orthography. First, the dimensions and their division into phonologically relevant components are discussed, in part 2, which concludes with a list of examples showing the relation of componential and linear notations of sixty Chortí forms. The relation of component bundles

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

to segmental symbols is stated in part 3 by means of intermediate elements, the <u>determinant</u> component bundles. Once the segment to determinant relations are specified, together with the determinations, the structure of Chortí syllables will be stated, in part 4, with a brief section on exosyllabic phonemes.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

FOOTNOTES

[1]C. F. Hockett, 'Componential analysis of Sierra Popoluca', IJAL 13.258 (1947).

[2]Hockett, 'Componential analysis', IJAL 13.258 (1947).

[3]C. F. Voegelin, 'Linear phonemes and additive components', Word 12.429 (1956).

[4]Voegelin, 'Linear phonemes', Word 12.431 (1956).

[5]Voegelin refers once to the Manual, but in another connection. Word 12.434 n. 5 (1956).

[6]It is not clear to me why Voegelin did not break / m n / into / b d / plus nasalization, and / e o /, / ɛ a / into / i u / plus mid and low, since these components fit the criterion of two-position operation. The further saving in his system would be worth making, but does not affect my argument. Notice that Voegelin's linear / p* / is non occurrent, like my / ž* /. See his discussion, Word 12.431 n. 1 (1956).

[7]Yuen-Ren Chao, 'The non-uniqueness of phonemic solutions of phonetic systems', in Martin Joos, ed., Readings in linguistics[3] 46 (New York, 1963).

[8]Zellig Harris, 'Simultaneous components in phonology', in RIL 127 (New York, 1963).

[9]Harris, 'Simultaneous components', in RIL 127 (New York, 1963).

[10]Zellig Harris, Methods in structural linguistics 94 (Chicago, 1951).

[11]Harris, Methods 125.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

[12]Harris is one of many who hold this view. For reasons explained in the text, I do not concur. It seems to me irrelevant to the utility or importance of phonemic elements whether they are simple or composite. The consequences of either view are all theoretical: on that level, they are of fundamental importance. If, as I believe, consistent analysis leads in the end to components, then for me, the issue is settled, and I must formulate my descriptions accordingly.

[13]The shape of an element is the list and sequence of its component features. Its substance is the measurable physical reality associated with the shape by a theory. The distribution of an element, being the totality of its environments, is not itself an element or feature under the definitions adopted here. I use the term shape as Martin Joos does, to avoid confusion of an ordinary sense of form with one or another of the technical senses given it by different linguists. See Martin Joos, The English verb (Madison: University of Wisconsin Press, 1964).

[14]Zellig S. Harris: Review of N. S. Trubetzkoy, Grundzüge der Phonologie (Prague, 1939), in Lg. 17.345-9 (1941).

[15]Zellig S. Harris, Methods 150.

[16]Roman Jakobson, E. Colin Cherry, and Morris Halle, 'Toward the logical description of languages in their phonemic aspect', Lg. 29 (1953), reprinted in Roman Jakobson, Selected writings I: phonological studies 456 ('s-Gravenhage, 1962). Halle's views have since changed: he now views a feature matrix as an expression of a morph. This does not affect my remarks about redundancy.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

[17]Roman Jakobson and Morris Halle, Fundamentals of language, Janua Linguarum, series minor I 45 ('s-Gravenhage, 1956).

[18]Yehoshua Bar-Hillel, 'Three methodological remarks on "Fundamentals of language"', Word 12.326 (1957).

[19]Pavle Ivić, 'Roman Jakobson and the growth of phonology', Linguistics 18.54 (Nov., 1965).

[20]Ivić, 'Roman Jakobson', Linguistics 18.54 (Nov., 1965).

[21]Roman Jakobson: 'The identification of phonemic entities', Travaux du Cercle linguistique de Copenhague 5.205-13 (1949), repr. in SWRJ I 422.

[22]Roman Jakobson and Morris Halle, 'Phonology and phonetics', SWRJ 500.

[23]Jakobson and Halle, 'Phonology and phonetics', SWRJ 501.

[24]Ivić, 'Roman Jakobson', Linguistics 18.55 (Nov., 1965).

[25]Samuel E. Martin, 'Korean phonemics', in RIL 365-6 (New York, 1963).

[26]Hockett, 'Componential analysis', IJAL 13.261 (1947).

[27]Compare Bernard Bloch, 'Studies in colloquial Japanese IV: phonemics', Lg. 26.92 (1950) with Otto Jespersen, Lehrbuch der Phonetik[3] 7 (Leipzig, Berlin, 1920), and the table facing p. 258.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

2.0 Phonetic Dimensions and Phonological Components

The physiological range of each component, as part of a phonetic dimension, is discussed here, with reference to a list of sixty numbered Figures at the end of the section. Table I summarizes the scheme of dimensions and components.

TABLE I

2.1 Articulators

L	Lip
F	Front of Tongue
B	Back of Tongue
N	Velic
G	Vocal Bands

2.2 Apertures

0	Stopped
1	Constricted
2	Close
3	Open

2.3 Manners

T	Tense
X	Lax

2.4 Stresses

I	Light
II	Heavy

2.5 Configurations

S	Sibilant
R	Retroflex
Y	Lateral

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

2.1 Articulators: L F B N G

Since articulators are organs, they are always present in every segment, and therefore, are constant in the examples. Each is at one or another aperture at any time.

Component L, the lower lip, articulates with the upper lip, or, less often, with the upper teeth at aperture 1. Component L is found at aperture 0 in Figures 1, 9-10, 21-2, 29, 33-4, 37-8, 41-4, 47-8, 56-7, and 60; at aperture 2 in Figures 11-2, 18-9, 29-30, 35-8, 40-4, 49-52, and 56; and at aperture 3 in Figures 1-34 and 39-60.

The component bundle L1 is rare in Chortí, occurring as an alternate for / hu / in some forms, always before vowels:

/ "fi'no / 'fine' (< Sp. fino)

/ "hui'no / 'fine'

/ +.'a"faŋ'?ki"nix+ / 'the sun has already risen'

/ +.'a"huaŋ'?ki"nix+ / 'the sun has already risen'

The alternation, as these examples show, is not confined to Spanish borrowings like the first pair, which many informants supplied. The second pair was supplied by Sr. González, who tends to use the / f / alternant more often than the / hu / alternant. In terms of components, the alternation is between L1 and L2B1.

Component F, the front of the tongue, includes the apex and the blade. The role of F in the production of front vocoids

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

is well known: palatograms of [i] and [e] phones of various languages show bilateral contact of the front with the palate, leaving a central channel aperture extending the length of the front of the tongue.[1]

Component F is found at aperture 0 in Figures 2, 6-8, 13, 24-36, 39-40, 43, 45-6, 49-50, 53-5, and 57; at aperture 1 in Figures 4, 7-12, 14-21, 31-2, 41-4, 49-54, and 57; at aperture 2 in Figures 1-2, 4-12, 17, 21, 25-7, 31-2, 38, 41-2, and 45-56; and at aperture 3 in Figures 11-3, 15-6, 18-20, 22-30, 33-4, and 36-60.

A dimension of configurations serves to distinguish various shapes of the F component at aperture 1. This dimension is discussed below, in section 2.3.

The back of the tongue, component B, includes the root and dorsum to the blade. This surface includes the portion of the tongue usually shown in vowel charts as the 'point of articulation' of 'low central' vocoids. In terms of the system adopted here, however, the [a] phones of Chortí are not only 'back' in the sense of being produced by articulator B, they are farther back than [o] and [u] phones, since the actual zone of <u>smallest</u> aperture is between the root and the pharynx, below the velum. Heffner shows saggital sections based on radiography which confirm the solution used here, and a full discussion based on measurements by various means is given in Chiba and Kajiyama.[2]

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Component B is found at aperture 0 in Figures 3, 17-20, 23-7, 37-8, 41-2, 44-8, and 58-9; at aperture 1 in Figures 5, 11-2, 17-21, 23-4, 31-2, and 57; at aperture 2 in Figures 13-4, 19-20, 22-8, 33-4, 39-50, and 53-60; and at aperture 3 in Figures 1-12, 15-8, 21, 25-7, 29-32, 35-48, and 51-7.

The upper surface of the velum, the velic, contacts the nasal pharynx to occlude the nasal passage. This is the articulation termed N0 in the examples. In nasalized spans, on the other hand, the velic opens away from the pharynx, and occludes neither the oral nor the nasal passage to an extent which causes turbulence. This articulation is termed N3. No intermediate apertures have been observed in Chortí.

Distinctive nasalization of vowels is frequent in Chortí. Examples are given in Figures 46, / ã /, 48, / ẽ /, 50, / õ /, 52, / ũ /, and 54, / ĩ /. All examples contain N0 spans. Aside from the examples of N3 during vowels, there are N3 spans with oral closure, at L in Figures 9-10, 21-2, 29, 37-8, 41-4, and 47-8; at F in Figures 6, 13-4, 24-6, 29-30, 35-6, 45-6, and 53-4; and at B in Figures 41 and 42.

The articulations of the glottis and movements of the larynx are of relatively greater phonetic complexity and phonological importance in Chortí than in the familiar European languages where the activities of these organs have been most often studied. Because of the unfortunate lack of instrumental studies of the

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

phenomena grouped under the label 'glottalization' in Mayan and other languages, some of the physiological causes of their auditory effects must be inferred, so that the phonological solution does not rest on direct experimental confirmation in every particular.

Since the laryngeal action is relevant in every segment of Chortí, the considerable complexity of its activities must be viewed in relation to the supraglottal articulations.

There are four clearly distinguishable glottal articulations in Chortí: complete and firm closure, voicing, laryngealization or trillized voicing, and full opening. Of these, the least familiar is laryngealization, which appears to be very similar to what Ladefoged has recently described for Hausa: 'In this state of the glottis there is a great deal of tension in the intrinsic laryngeal musculature, and the vocal cords no longer vibrate as a whole. The ligamental and arytenoid parts of the vocal cords vibrate separately, sometimes almost exactly 180º out of phase with one another, one end opening as the other end is closing.'[3] With reference to the same articulation, Pike observed that 'If one starts with a glottal trill, the addition of more tension and a more powerful air stream does not raise the pitch of the trill to turn it into voice, but tends simply to shut off the glottis completely and stop all sound; a glottal trill which starts with very strong lung pressure and tension must have definite relaxation (rather than further tension) of the vocal cords before they can produce voice.'[4] Ladefoged also

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

feels that 'It is often not possible to make an absolute distinction between laryngealization and glottal closure; as in the case of so many other phonetic oppositions there is an infinite gradation between the poles of the two categories...Because I have not been able to distinguish consistently between voiced consonants with an accompanying glottal stop and similar consonants marked by laryngealization, I have symbolized both by a prefixed ?̰. In view of the unitary nature of the sound, in many cases the ?̰ might well have been linked to the following sound by a tie bar.'[5]

It appears from these works and from my own observation and imitation of Chortí, first, that the relevant feature which distinguishes laryngealized voice from ordinary voice is greater tension of the laryngeal muscles, including the vocal bands, during laryngealization, and second, that glottal stop closure shares this component of tension, which is relatively greater during closure than during laryngealized voice. I base my phonological analysis on this phonetic description.

In the major dialect of Chortí, laryngealized voice occurs only in segments of supraglottal apertures 2 and 3. In the Camotán dialect there is a laryngealized glottalic suction stop, during the production of which the larynx is depressed, and laryngealized voicing is audible. The oral closure is labial. This stop segment, common to most of the Mayan languages, is usually termed a 'voiced glottalized stop.'

The open voiceless adjustment of the glottis involves the

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

greatest glottal aperture of those found in Chortí, and therefore the greatest volume of air passing through the glottal constriction in a given time. This aperture, then, is assigned a 3 in the examples. During voiced spans, which I have labelled G1 in the examples, the air flow is much lower in a given length of time, since the glottis remains closed except during the very brief openings, at each of which a single pulse of air is released.[6] Laryngealized voice is treated as G1T, and closure, of course, as G0. I was not able to detect or infer any difference in glottal aperture such as that described by Lehiste and Ladefoged, where the glottal aperture, during [h] for example, is somewhere between the open voiceless aperture and the rather narrow aperture of whisper. Accordingly, no aperture 2 of the glottis will appear in the examples.[7]

The higher volume of air which flows past the open glottis produces a rapidly rising pressure behind any supraglottal constriction. In Chortí, the oral stops and spirant adjustments which occur while the glottis is either open or fully closed show greater tension of the articulator than the corresponding oral stops and spirants occurring in voiced spans. I assume that this greater tension is due to the effort required to contain the higher back pressure. The back pressure is highest behind oral stops produced while the glottis is closed, with forceful elevation of the larynx, which has the effect of rapidly compressing the air in the oral cavity. There is pronounced aspiration when the oral closure is released.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Component G is found at aperture 0 in Figures 1-7, 22-4, 26-8, 34, 36-40, and 59-60; at aperture 1 in all Figures, 1-60; and at aperture 3 in Figures 1-5, 7-21, 23-8, 31-5, 37, 39-41, 43-50, 56, and 58.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

2.2 Apertures: 0 1 2 3

The aperture at a given articulator is the volume of open space between the surface of the articulator and the point or zone of articulation, measured where that volume is smallest. This definition allows the use of a single dimension of aperture in the characterization of contoids and vocoids.

Aperture 0 is complete occlusion by contact of the surface of the articulator against the zone of articulation.

In aperture 1, the constricted aperture produces fricative turbulence at moderate or higher airstream values. There is usually partial occlusion.

There is little or no fricative turbulence at any air stream value at aperture 2, and none at aperture 3. These vocoid segments call for some discussion.

All the apertures are found in all 60 Figures, except that aperture 2 does not occur in Figures 15-6. Combinations of aperture and articulator may be found most conveniently by referring to the articulator examples.

Characterizing vocoids according to articulatory aperture leads to quite different relationships from those shown in the familiar vowel quadrilateral, where advancement and height of the zone of articulation within the oral cavity alone are the parameters.

Using the measurements reported by Chiba and Kajiyama as a guide, the following table of relative apertures accounts for the Chortí distinctions:[8]

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

	L	F	B
/ i /	3	2	3
/ e /	3	3	3
/ a /	3	3	2
/ o /	2	3	2
/ u /	2	3	3

The arrangement of components given above for / a / applies equally to [a] segments and to the [ʌ] alternants which occur before dorsals, in the same syllable, as in

['sʌk"sʌk] 'white'

['mʌk"te?e] 'corral'

These results are both unexpected and unfamiliar; however, if the precise relationship of these apertures to the different measurements reflected in familiar vowel charts is kept clear, there will be no confusion. In any case, each vowel is characterized by a different array of components, and these components are quite straightforwardly related to a measurable physical dimension. Nasalized vowels occur, with the same component combination as the oral vowels except for N3 instead of N0.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

2.3 Manners: T X

Judgements of the tension (T) or laxness (X) of an articulator are based on both kinesthetic introspection during imitations of Chortí pronunciation and the observation of native speakers. In many environments, segments do not differ in tension or laxness. In such cases, neither manner feature is assigned to the segment. Nasals, for example, are all about the same in the degree of tension of the articulator muscles, whatever other variables may occur with them. Nasals are neither tense nor lax, nor does this mean that they are characterized by an additional 'plain' feature. As in the case of the F1 articulation, where there is a basic configuration, F1, and other additive 'special' configurations, so in the case of stops, among others, there is a basic degree of articulatory tension, demonstrated by the oral articulations of nasals, and two 'special' additive differences, one of greater tension, and one of lesser tension than the basic value, shown in tense and lax oral stops. Associated with the tense spans' greater muscular tension are more rapid release movements, while the lax spans show slower release movements. I attribute this difference partly to the effects of release of back pressure in the occluded cavity, higher in tense spans due either to compression by elevation of the larynx during glottal closure or to rapid airflow through the voiceless open glottis. In lax spans, the voiced glottal adjustment results in slower airflow into the oral cavity, so that there is less increase in back pressure during a given time.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Component T occurs with components L0 in Figures 1, 33-4, and 60; with F0 in Figures 2, 7-8, 13, 25-8, 31-6, 39-40, 43, and 49-50; with F1 in Figures 4, 7-12, 14-21, 31-2, and 49-50; with B0 in Figures 3, 17-20, 23-7, 37-8, 41, 44-8, and 58-9; with B1 in Figures 5, 11-2, 17-21, 23, 31-2, and 56; with G0 in Figures 1-7, 22-4, 26-8, 34, 36-40, and 59-60; and with G1 in Figures 37-8.

Component X occurs with components L0 in Figures 56-7; with F0 in Figures 55 and 58; and with B0 in Figure 42.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

2.4 Stresses: I II

There are two distinctive differences of stress in Chortí. Neither the articulatory nor the acoustic variables underlying the perceived differences are well understood. Martin formulated a tentative articulatory definition: 'Stress is the relative sharpness of attack on a sequence of one or more phonetic segments, often immediately preceded by a slight anticipatory slowing in pace (a kind of phonetic syllable-junctire, if you will).'[9]

Like other features, a single stress spans one or more segments. Variations of prominence during a stress span are determined by the environment of features. Generally it holds true that prominence increases with aperture during a stress span. A decrease in prominence at the end of a span, then a new attack on the next sequence, are the cues Martin referred to just above.

Besides the distinctive differences of degree of stress in Chortí, there are, obviously, differences in length of span. Because the notion of onset of stress has been quite frequently misunderstood, it will be sketched here as a phonetic phenomenon as well as treated later as a phonological problem. The cues of change of pace and change of sharpness of attack mentioned by Martin are both helpful in locating stress change points. Often there is no difficulty in hearing the onset cues, particularly of heavy stress, where there is a very marked difference between the stresses of one segment and the next. In reduplicated forms, like ['sʌk"sʌk] 'white', the syllables differ

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

only in degree of stress, but the change point is unmistakable. A near minimal contrast of stress distinguishes these forms:

["ka'txu] 'horn'

['ka"txu?u] 'our milk'.

Distinctive differences in length of stress spans are easily perceived too:

['u?t"sihk] 'floor of nest'

['u"?tsihk] 'his clay'.

One, two, or three consecutive vocoid segments occur within a single span of stress:

(1) ['ek"mai] 'he descended'

(2) ['eek"mai] 'he descends'

(3) ['e?ek"mai] 'he descends'

(4) ['?keu"rar] 'skin'

(5) ["?txe?eu] 'bowl'.

The length of a syllabic nucleus is proportional to the vowel letters in this notation: the longest syllable is number (5), while the first syllabic of number (1) and the second of number (4) are of about the same length. All the syllables of numbers (2), (3), and (4) are of roughly equal length. The first syllables of (2) and (3) are of the same length in most occurrences, since an intervocalic [?] usually does not involve glottal closure before the laryngealized vocoid segment. There is a discussion of this notation, with examples, at the end of this section.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

2.5 Configurations: S R Y

Articulator F at aperture 1 has one of four shapes. One of these resembles the configurations of other articulators at aperture 1, in that the surface of the articulator nearest the zone of articulation is relatively flat, so that a large area of the articulator is brought into play. The laminoalveolar articulation of [š] phones in Chortí is, in this sense, similar to the dorsovelar [x] phones and the labiodental [f] or bilabial [ø] spirants in a way that the [s], [r], and [l] phones are not. These last three are all apicals of relatively smaller articulator area, and smaller total aperture. This is my reason for assigning the [š] phones to the same series as the [f] and [x] phones. My orthographic practice of writing [x] with / h / and [š] with / x / follows Mayanist usage.

Component S, the sibilant configuration, is a grooved apicodental spirant of higher perceived pitch than the plain F1 articulation, indicating a smaller effective aperture.

Components R, retroflex, and Y, lateral, both involve a lifted apex. In the case of R, there is lateral contact and central aperture, either continuous or interrupted by trills or taps. In the case of Y, the contact is central, with bilateral aperture.

Component S is found in Figures 4, 9, 11, 17-21, 32, and 44; component R in Figures 16, 31-2, 41-3, 51-4, and 57; and component Y in Figure 44.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

2.6 Figures

Sixty numbered figures are provided below in order to show the components in various environments, and to show the relation of components to determinants and linear symbols.

The basis for the componential notation is a rectangular array, with the articulators in a vertical column at the left, each labelling a horizontal row. The aperture of an articulator is noted in the row to the right of it. Stress spans are shown in a separate line, just above a line for configurational components across the bottom of each matrix.

What the transcription used just above shows as the sequential order of stresses among the segment symbols, then, is the position of the stress change points, and therefore, the length of each stress span.

The usual notation of stress features, on the other hand, by placing the stress symbol at the center of prominence of each syllable, fails to show the location of the change points, and therefore, fails to provide a basis for syllable division by marking the duration of each stress.

Since a Chortí syllable is equal to a single stress span, marking onset of stress marks syllable division as well. And since all components are marked in order of onset, there is a gain in consistency over the syllable-peak type of notation of stresses.

The phonetic status of a span of stress is exactly that of a span of voicelessness or laryngealization. There is neither

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

provision nor motive within the phonetic framework for treating stress as a special case. Its phonological status also must be settled according to the same criteria and conventions applied in the analysis of other phonological features.

All 60 Figures include spans of heavy stress (II), and light stresses, component I, occur in Figures 11-2, 25-7, 29-30, and 41-57. Since any of the L, F, or B articulators is sometimes tense or lax, and since the G, or glottal, articulator is sometimes tense, there is a line for noting the presence and duration of these manner features separately for each articulator.

The span of a component is shown by extending a line of hyphens to the right of the identifying symbol for the component. Some compromises are required between the linear notation at the top of each example and the componential matrix itself. Because of these, it is not always the case that one column equals one segment or one unit of time. Syllables -- stress spans, that is -- are separated by an empty column. The relation between the / ? / and the following linear symbol, in many cases, is such that the two denote a single segment, as in the beginning of Figures 23, 24, 34, 36, and 38. Figure 22 / "?am / 'spider', Figure 38 / "?ku?um / 'dough', and Figure 54 / "a?k / 'tongue' will illustrate the departures from segment-for-column representation. The first segment of / "?am / is a very brief glottal closure during which the supraglottal articulators are in position for the following / a /. In / "?ku?um /, after the / "?ku /-

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

portion, there is either a brief glottal closure with oral / u / characteristics, followed by a laryngealized / u /, or, in other occurrences, no glottal closure before the laryngealized second / u /. The component matrix given in Figure 38 shows the variety with glottal closure. If the matrix represented the type without a glottal closure before the second [u], the matrix would differ only in showing a 1 in the G row below the [?], and a hyphen to the right of it, under the [u]. Since there would, in that case, be no difference between the [?] and [u] columns, they would represent a single segment, which for practical orthographic reasons, is represented by a digraph [?u]. The linear notation, therefore, is the same for these two cases, while the matrix notation distinguishes them clearly.

Thus, the transcription by linear symbols in the topmost line fails to show certain variable features clearly displayed in the component matrix below it. While it would be possible to devise a linear transcription which did show all the variables, I have chosen instead to introduce the phonemic notation of part 3 at this point, so that unnecessary duplication of examples will be avoided.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

EXAMPLES AND GLOSSES

1.	"pi?i	'peep'
2.	"ti?i	'lip'
3.	"ki?i	'Go away! '
4.	"si?i	'firewood'
5.	"hi?i	'sand'
6.	"ni?i	'muzzle'
7.	"txi?i	'nanche'
8.	"txi	'who'
9.	"mis	'cat'
10.	"mix	'no longer'
11.	'u"sih	'buzzard'
12.	'u"xih	'three days hence'
13.	"tan	'ashes'
14.	"xan	'frond'
15.	"xex	'dirty'
16.	"xer	'share'
17.	"sihk	'nest'
18.	"suhk	'dustless'
19.	"sohk	'trash'
20.	"sahk	'locust'
21.	"sihm	'catarrh'
22.	"?am	'spider'
23.	"?kahk	'fire'
24.	"?kahn	'bench'
25.	'ta"kin	'dry'

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

26.	'ta"?kin	'in the sun'
27.	'ta?a"?kin	'iron' ('sun-dung')
28.	"ta?a	'dung'
29.	'u"men	'by him'
30.	'u"nen	'man's child'
31.	"txihr	'net'
32.	"tsihr	'shoulder bag'
33.	"pat	'back'
34.	"?pat	'hailstone'
35.	"tun	'stone'
36.	"?tun	'croak'
37.	"ku?um	'egg'
38.	"?ku?um	'dough'
39.	"tia?a	'where'
40.	"tua?a	'so'
41.	'iŋ'kor"ma	'I hunt'
42.	'iŋ'gor"ma	'I wrap'
43.	'ta"rum	'to the ground'
44.	'ka'lum"se	'we pass along'
45.	'aak"ni	'he weeds'
46.	'ãã̃k"ni	'I weed'
47.	'eek"mai	'he descends'
48.	'ẽẽ̃k"mai	'I descend'
49.	'oo"txoi	'he enters'
50.	'õõ̃"txoi	'I enter'
51.	'uu"ri	'he throws'
52.	'ũũ̃"ri	'I throw'

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

53.	'iir"na	'he is seen'
54.	'ĩĩr"na	'I am seen'
55.	"di'ia	'day'
56.	"bie'hɵ	'old'
57.	'ber"da	'true'
58.	"ak	a vegetable
59.	"a?k	'tongue'
60.	"a?p	'hennequen'

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

1.

	"	p	i	?	i
L		0	3	-	-
		T			
F		2	-	-	-
B		3	-	-	-
N		0	-	-	-
G		3	1	0	-
				T	-
S		II	-	-	-
C					

2.

	"	t	i	?	i
L		3	-	-	-
F		0	2	-	-
		T			
B		3	-	-	-
N		0	-	-	-
G		3	1	0	-
				T	-
S		II	-	-	-
C					

3.

	"	k	i	?	i
L		3	-	-	-
F		2	-	-	-
B		0	3	-	-
		T			
N		0	-	-	-
G		3	1	0	-
				T	-
S		II	-	-	-
C					

4.

	"	s	i	?	i
L		3	-	-	-
F		1	2	-	-
		T			
B		3	-	-	-
N		0	-	-	-
G		3	1	0	-
				T	-
S		II	-	-	-
C		S			

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

5.

	"	h	i	?	i
L		3	-	-	-
F		2	-	-	-
B		1	3	-	-
		T			
N		0	-	-	-
G		3	1	0	-
				T	-
S		II	-	-	-
C					

6.

	"	n	i	?	i
L		3	-	-	-
F		0	2	-	-
B		3	-	-	-
N		3	0	-	-
G		1	-	0	-
				T	-
S		II	-	-	-
C					

7.

	"	t	x	i	?	i
L		3	-	-	-	-
F		0	1	2	-	-
		T	-			
B		3	-	-	-	-
N		0	-	-	-	-
G		3	-	1	0	-
					T	-
S		II	-	-	-	-
C						

8.

	"	t	x	i
L		3	-	-
F		0	1	2
		T	-	
B		3	-	-
N		0	-	-
G		3	-	1
S		II	-	-
C				

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

9.

	"	m	i	s
L		0	3	-
F		2	-	1 T
B		3	-	-
N		3	0	-
G		1	-	3
S C		II	-	- S

10.

	"	m	i	x
L		0	3	-
F		2	-	1 T
B		3	-	-
N		3	0	-
G		1	-	3
S C		II	-	-

11.

	'	u	"	s	i	h
L		2		3	-	-
F		3		1 T	2	-
B		3		-	-	1 T
N		0		-	-	-
G		1		3	1	3
S C		I		II S	-	-

12.

	'	u	"	x	i	h
L		2		3	-	-
F		3		1 T	2	-
B		3		-	-	1 T
N		0		-	-	-
G		1		3	1	3
S C		I		II	-	-

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

13.

	"	t	a	n
L		3	-	-
F		0	3	0
		T		
B		2	-	-
N		0	0	3
G		3	1	-
S		II	-	-
C				

14.

	"	x	a	n
L		3	-	-
F		1	3	0
		T		
B		2	-	-
N		0	0	3
G		3	1	-
S		II	-	-
C				

15.

	"	x	e	x
L		3	-	-
F		1	3	1
		T		T
B		3	-	-
N		0	-	-
G		3	1	3
S		II	-	-
C				

16.

	"	x	e	r
L		3	-	-
F		1	3	1
		T		T
B		3	-	-
N		0	-	-
G		3	1	3
S		II	-	-
C				R

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

17.

	"	s	i	h	k
L	3	-	-	-	
F	1	2	-	-	
	T				
B	3	-	1	0	
			T	-	
N	0	-	-	-	
G	3	1	3	-	
S	II	-	-	-	
C	S				

18.

	"	s	u	h	k
L	2	-	-	3	
F	1	3	-	-	
	T				
B	3	-	1	0	
			T	-	
N	0	-	-	-	
G	3	1	3	-	
S	II	-	-	-	
C	S				

19.

	"	s	o	h	k
L	2	-	-	3	
F	1	3	-	-	
	T				
B	2	-	1	0	
			T	-	
N	0	-	-	-	
G	3	1	3	-	
S	II	-	-	-	
C	S				

20.

	"	s	a	h	k
L	3	-	-	-	
F	1	3	-	-	
	T				
B	2	-	1	0	
			T	-	
N	0	-	-	-	
G	3	1	3	-	
S	II	-	-	-	
C	S				

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

21.

	"	s	i	h	m
L		3	-	-	0
F		1	2	-	-
		T			
B		3	-	1	-
				T	-
N		0	-	-	3
G		3	1	3	-
S		II	-	-	-
C		S			

22.

	"	?	a	m
L		3	-	0
F		3	-	-
B		2	-	-
N		0	-	3
G		0	1	-
		T		
S		II	-	-
C				

23.

	"	?	k	a	h	k
L		3	-	-	-	-
F		3	-	-	-	-
B		0	-	2	1	0
		T	-		T	-
N		0	-	-	-	-
G		0	-	1	3	-
		T	-			
S		II	-	-	-	-
C						

24.

	"	?	k	a	h	n
L		3	-	-	-	-
F		3	-	-	-	0
B		0	-	2	1	-
		T	-		T	
N		0	-	-	-	3
G		0	-	1	3	-
		T	-			
S		II	-	-	-	-
C						

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

25.

	'ta"kin
L	3 - - - -
F	0 3 2 - 0
	T
B	2 - 0 3 -
	T
N	0 - - - 3
G	3 1 3 1 -
S	I - II - -
C	

26.

	'ta"?kin
L	3 - - - - -
F	0 3 2 - - 0
	T
B	2 - 0 - 3 -
	T -
N	0 - - - - 3
G	3 1 0 - 1 -
	T -
S	I - II - - -
C	

27.

	'ta?a"?kin
L	3 - - - - - - -
F	0 3 - - 2 - - 0
	T
B	2 - - - 0 - 3 -
	T -
N	0 - - - - - - 3
G	3 1 0 - - - 1 -
	T - - -
S	I - - - II - - -
C	

28.

	"ta?a
L	3 - - -
F	0 3 - -
	T
B	2 - - -
N	0 - - -
G	3 1 0 -
	T -
S	II - - -
C	

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

29.

	' u " m e n
L	2 0 3 -
F	3 - - 0
B	3 - - -
N	0 3 0 3
G	1 - - -
S C	I II - -

30.

	' u " n e n
L	2 3 - -
F	3 0 3 0
B	3 - - -
N	0 3 0 3
G	1 - - -
S C	I II - -

31.

	" t x i h r
L	3 - - - -
F	0 1 2 - 1
	T -
B	3 - - 1 -
	T -
N	0 - - - -
G	3 - 1 3 -
S	II - - - -
C	R

32.

	" t s i h r
L	3 - - - -
F	0 1 2 - 1
	T -
B	3 - - 1 -
	T -
N	0 - - - -
G	3 - 1 3 -
S	II - - - -
C	S R

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

33.

	"	p	a	t
L		0	3	-
		T		
F		3	-	0
				T
B		2	-	-
N		0	-	-
G		3	1	3
S		II	-	-
C				

34.

	"	?	p	a	t
L		0	-	3	-
		T	-		
F		3	-	-	0
					T
B		2	-	-	-
N		0	-	-	-
G		0	-	1	3
		T	-		
S		II	-	-	-
C					

35.

	"	t	u	n
L		2	-	-
F		0	3	0
		T		
B		3	-	-
N		0	-	3
G		3	1	-
S		II	-	-
C				

36.

	"	?	t	u	n
L		2	-	-	-
F		0	-	3	0
		T	-		
B		3	-	-	-
N		0	-	-	3
G		0	-	1	-
		T	-		
S		II	-	-	-
C					

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

37.

	#	k	u	?	u	m
L		2	-	-	-	0
F		3	-	-	-	-
B		0	3	-	-	-
		T				
N		0	-	-	-	3
G		3	1	0	1	-
				T	-	
S		II	-	-	-	-
C						

38.

	#	?	k	u	?	u	m
L		2	-	-	-	-	0
F		3	-	-	-	-	-
B		0	-	3	-	-	-
		T	-				
N		0	-	-	-	-	3
G		0	-	1	0	1	-
		T	-		T	-	
S		II	-	-	-	-	-
C							

39.

	#	t	i	a	?	a
L		3	-	-	-	-
F		0	2	3	-	-
		T				
B		3	-	2	-	-
N		0	-	-	-	-
G		3	1	-	0	-
					T	-
S		II	-	-	-	-
C						

40.

	#	t	u	a	?	a
L		2	-	3	-	-
F		0	3	-	-	-
		T				
B		3	-	2	-	-
N		0	-	-	-	-
G		3	1	-	0	-
					T	-
S		II	-	-	-	-
C						

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

41.

	'	i	ɔ	'	k	o	r	"	m	a
L		3	-		2	-	-		0	3
F		2	-		3	-	1		3	-
B		3	0		-	2	-		-	-
					T					
N		0	3		0	-	-		3	0
G		1	-		3	1	-		-	-
S		I	-		I	-	-		II	-
C							R			

42.

	'	i	ɔ	'	g	o	r	"	m	a
L		3	-		2	-	-		0	3
F		2	-		3	-	1		3	-
B		3	0		-	2	-		-	-
					X					
N		0	3		0	-	-		3	0
G		1	-		-	-	-		-	-
S		I	-		I	-	-		II	-
C							R			

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

43.

	'	t	a	"	r	u	m
L		3	-		2	-	0
F		0	3		1	3	-
		T					
B		2	-		3	-	-
N		0	-		-	-	3
G		3	1		-	-	-
S		I	-		II	-	-
C					R		

44.

	'	k	a	'	l	u	m	"	s	e
L		3	-		2	-	0		3	-
F		3	-		1	3	-		1	3
B		0	2		3	-	-		-	-
		T								
N		0	-		-	-	3		0	-
G		3	1		-	-	-		3	1
S		I	-		I	-	-		II	-
C					Y				S	

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

45.

	'	a	a	k	"	n	i
L	3	-	-	-	-		
F	3	-	-	0	2		
B	2	-	0 T	3	-		
N	0	-	-	3	0		
G	1	-	3	1	-		
S C	I	-	-	II	-		

46.

	'	ǎ	ǎ	k	"	n	i
L	3	-	-	-	-		
F	3	-	-	0	2		
B	2	-	0 T	3	-		
N	3	-	0	3	0		
G	1	-	3	1	-		
S C	I	-	-	II	-		

47.

	'	e	e	k	"	m	a	i
L	3	-	-	0	3	-		
F	3	-	-	-	-	2		
B	3	-	0 T	2	-	-		
N	0	-	-	3	0	-		
G	1	-	3	1	-	-		
S C	I	-	-	II	-	-		

48.

	'	ě	ě	k	"	m	a	i
L	3	-	-	0	3	-		
F	3	-	-	-	-	2		
B	3	-	0 T	2	-	-		
N	3	-	0	3	0	-		
G	1	-	3	1	-	-		
S C	I	-	-	II	-	-		

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

49.

	' o	o	" t	x	o	i
L	2	-	-	-	-	3
F	3	-	0	1	3	2
			T	-		
B	2	-	-	-	-	-
N	0	-	-	-	-	-
G	1	-	3	-	1	-
S	I	-	II	-	-	-
C						

50.

	' ŏ	ŏ	" t	x	o	i
L	2	-	-	-	-	3
F	3	-	0	1	3	2
			T	-		
B	2	-	-	-	-	-
N	3	-	0	-	-	-
G	1	-	3	-	1	-
S	I	-	II	-	-	-
C						

51.

	' u	u	" r	i
L	2	-	3	-
F	3	-	1	2
B	3	-	-	-
N	0	-	-	-
G	1	-	-	-
S	I	-	II	-
C			R	

52.

	' ŭ	ŭ	" r	i
L	2	-	3	-
F	3	-	1	2
B	3	-	-	-
N	3	-	0	-
G	1	-	-	-
S	I	-	II	-
C			R	

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

53.

	'i	i	r	"n	a
L	3	-	-	-	-
F	2	-	1	0	3
B	3	-	-	2	-
N	0	-	-	3	0
G	1	-	-	-	-
S C	I	-	- R	II	-

54.

	'ɪ	ɪ	r	"n	a
L	3	-	-	-	-
F	2	-	1	0	3
B	3	-	-	2	-
N	3	-	0	3	-
G	1	-	-	-	-
S C	I	-	- R	II	-

55.

	"d	i	'i	a
L	3	-	-	-
F	0 X	2	-	3
B	3	-	2	-
N	0	-	-	-
G	1	-	-	-
S C	II	-	I	-

56.

	"b	i	e	'h	o
L	0 X	3	-	2	-
F	2	-	3	-	-
B	3	-	-	1 T	2
N	0	-	-	-	-
G	1	-	-	3	1
S C	II	-	-	I	-

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

57.

	'	b	e	r	"	d	a
L		0	3	-		-	-
		X					
F		3	-	1		0	3
						X	
B		3	-	-		2	-
N		0	-	-		-	-
G		1	-	-		-	-
S		I	-	-		II	-
C				R			

58.

	"	a	k
L		3	-
F		3	-
B		2	0
			T
N		0	-
G		1	3
S		II	-
C			

59.

	"	a	?	k
L		3	-	-
F		3	-	-
B		2	-	0
				T
N		0	-	-
G		1	0	-
			T	-
S		II	-	-
C				

60.

	"	a	?	p
L		3	-	0
				T
F		3	-	-
B		2	-	-
N		0	-	-
G		1	0	-
			T	-
S		II	-	-
C				

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

FOOTNOTES

[1]Compare, in l'abbé Rousselot, Principes de phonétique expérimentale[2] 651, 655, 664 (Paris, 1924), the palatograms of Figure 433, Voyelles antérieures, with those of Figure 436, Voyelles postérieures, and the palatalization effects in Figure 443, Mouillures. Front vowels and palatalized consonants are very much alike in palatal contact, while of the back vowels, [a] shows least palatal contact, usually two very small rear lateral areas, or none.

[2]R-M. S. Heffner, General phonetics 89 (Madison, 1952) shows saggital sections of cardinal [a i u], and discussion is given in Tsutomu Chiba and Masato Kajiyama, The vowel, its nature and structure 115-31 (Tokyo, 1958).

[3]Peter Ladefoged, A phonetic study of West African languages, an auditory-instrumental survey, West African Language Monograph Series 1.16 (Cambridge, 1964).

[4]Kenneth L. Pike, Phonetics, University of Michigan Publications in language and literature 21.127 (Ann Arbor, 1943).

[5]Ladefoged, A phonetic study of West African languages 17.

[6]Martin Joos, Acoustic phonetics, Language Monograph 23.38-9 (Baltimore, 1948), Figs. 18-9.

[7]See Ilse Lehiste, 'Study of [h] and whispered speech', JASA 34.742 (1962) and Ladefoged, A phonetic study of West African languages 16.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

[8]Chiba and Kajiyama in The Vowel 115-31 (Tokyo, 1958) carefully reconstructed vocal tract models of Japanese phones from palate casts and x-ray photographs of Japanese subjects. They measured the cross-sectional areas of these models in a succession of planes at centimeter intervals, and reported the results summarized here, where areas are in square centimeters, and the parenthesized numerals at the head of each column indicate the measurement planes. The smallest value of each set is shown:

Phone	Lips (-1)	Teeth (0)	Front (1-4)	Back (5-9)
[i]	4.55	1.76	0.80	7.10
[e]	5.00	3.20	1.90	3.10
[a]	8.40	5.65	10.40	1.15
[o]	1.40	2.00	9.20	1.35
[ɯ]	1.65	0.75	4.50	2.00

Chortí [u] has greater lip-rounding than Japanese [ɯ], which would result in smaller lip aperture for Chortí [u]. Otherwise the values in a similar table for Chortí vowels would not differ markedly from the ones just above.

[9]Samuel Elmo Martin, rev. of C. F. Hockett, Manual of Phonology, Lg. 32.702 (1956).

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

3. Determinants and Determination

The phonological representations of Chortí utterances which satisfy the general postulates are the complete arrays of components, as found in the Figures in part 2.6. All the components are equally distinctive all the time, by virtue of their occasionally unpredictable occurrence. A varying degree of redundancy within a component array, as I pointed out in part 1, is a characteristic of the whole array, given the theoretical structure employed here: redundancy is not an attribute of individual components.

It is desirable, however, to exploit the regularities of the component arrays in designing a simplified, practical orthography. This simplifying or abbreviating role, which is filled by the phonemes of segmental and mixed solutions, is filled here by the determinants. These are invariant bundles of components which, on the one hand, allow the prediction of the determined components of any utterance, and on the other hand, are the unambiguous referents of the linear orthographic symbols.

Thus, the phonological constituents of an utterance are all the components which occur in it. Some of these components also belong to determinants, which make up a fraction of the utterance. Given the arrangement of components in the determinants, the remaining, or determined, components of an utterance are predictable. Each determinant is the referent of one and only one symbol of the linear orthography, so that an

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

utterance which is transcribed by a line of orthographic symbols is unambiguously related to one arrangement of determinants, and thereby, to the full array of phonological components of the utterance. Since there is only one arrangement of determinants in any given component array, there is only one line of orthographic symbols which transcribes each utterance: the solution is biunique, or in Chao's older and better term, it has symbolic reversibility.[1]

The following table shows the determinant components of endosyllabic segments, with the orthographic symbols used to represent them.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Endosyllabic Determinants and Orthographic Symbols

		L	F	B
O	T	p	t	k
	N 3	m	n	ŋ
X		b	d	g
1	T	f	x	h

L	F	B	N	
3	3	2	0	a
3	3	2	3	ã
3	3	3	0	e
3	3	3	3	ẽ
3	2		0	i
3	2		3	ĩ
2	3	2	0	o
2	3	2	3	õ
2	3	3	0	u
2	3	3	3	ũ

S	R	Y	GT	I	II
s	r	l	?	'	"

Four exosyllabic determinants occur: two kinds of pause and two pitch contours. The pauses are exosyllabics because

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

they never occur during stress spans; while the pitch contours usually span several syllables just before a pause.

The two pauses are:

+ / + / 'Pause', a relatively short span where no stress occurs, and thus, no phonation.

— / — / 'Hesitation', a relatively long span where no stress occurs, sometimes lasting several seconds and often preceded by a progressively slower drawling of the last several syllables or segments. If the last two segments before / — / are a vowel and a stop, for example, the vowel will often be long and the stop held for a second or two before the pause begins.

A pause group is an uninterrupted sequence of one or more syllables preceded and followed by either / + / or / — /.

Two pitch contours are distinctive: / , / 'Rise', and / . / 'Fall'. In long pause groups, the rise or fall occurs during the last few syllables. In shorter pause groups the contour spans the entire group.

Not all pause groups include a pitch contour. Some, especially those ending in / — /, are level in pitch. In those groups where a contour does occur, it is transcribed at onset, that is, at the beginning of the pause group, and after the initial / + / or / — /. The exact point where the slope begins, like the amount of rise or fall, is not distinctive.

The statements of determination of components given below are sufficient to fill out a complete array, given only deter-

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

minants, or the orthographic symbols representing them, as the starting point. The statements apply within one span of stress, but never across stress change points.

In applying these rules it is necessary to observe that they apply to segments, and that the number of segments in a Figure is not always equal to the number of columns. The reasons for this have already been set down, and a review of the discussion in part 2 may be of assistance in checking the correctness of the determination rules against the examples.

The conventions of the rule statements are simple. The rule for R and Y segments, for instance, states that they are F1NO (frontal constrictives, oral) adjacent to all components. The convention followed in writing the rules is to regard the F1NO here, and any components determined in all environments, as falling under the same rules as determinants. The R and Y segments, then, are also covered by the F1 rule. The R, Y rule further states that these segments are G3 (open voiceless glottis) before pause or G3 segments, or after G3 segments, and that they are G1 (voiced) in all other environments. The other rules will be clear with these conditions in mind.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

DETERMINATION RULES

Determinants including	Determine	After	With	Before	Adj.
LO L1	F2 F3 B2 B3				F2 Other B2 Other
FO F1	L2 L3 B2 B3				L2 Other B2 Other
BO B1	L2 L3 F2 F3				L2 Other F2 Other
L3F2	B2 B3				B2 Other
L3F2 L3F3B2 L3F3B3 L2F3B3 L2F3B2	GO G1		GT	O +	 Other
	F1NO				All
R Y	G3 G3 G1	G3		+ G3	 Other
S	F1TNOG3				All

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Determinants including	Determine	After	With	Before	Adj.
I	I	I			
II	II	II			
X	NOG1				All
	O	+			
		O			
				+	
				O	
	1				Other
LT	NO				All
FT	GO		GT		
BT	G3				Other
ON3	G3	G3			
	G1				Other
GT	GO		OT		
				+	
	G1				Other

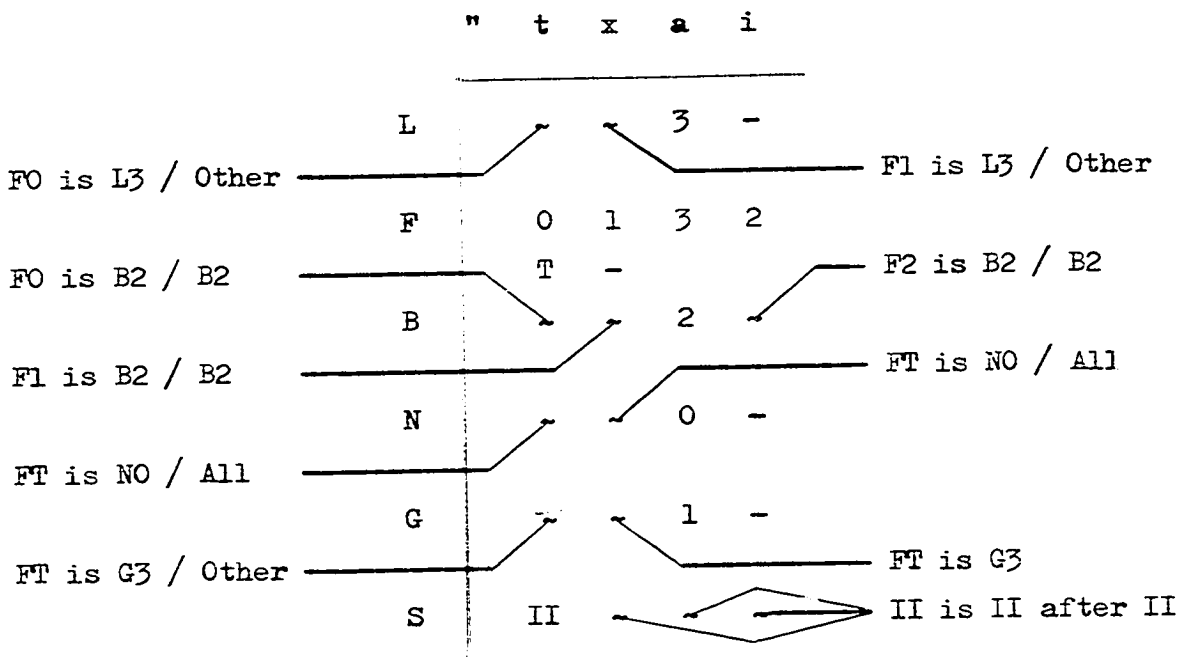
Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

The abstracted form 'fish' would be cited / "txai /, while the utterance 'Fish?' might be / +,"txai+ /, and 'Fish.' would be / +."txai+ /.

The application of the rules to an example is shown in the next two figures. The first shows the determinants of each of the orthographic symbols of / "txai /, with the determined components supplied by the appropriate rules displayed in the margins around the determinants. The resulting array is shown in the second figure, written according to the same conventions followed in the Figures given earlier, in part 2.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

DETERMINANTS AND DETERMINATIONS



RESULTING ARRAY

	"	t	x	a	i
L		3	-	-	-
F		0	1	3	2
		T	-		
B		2	-	-	-
N		0	-	-	-
G		3	-	1	-
S		II	-	-	-

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

FOOTNOTES

[1]Yuen-Ren Chao, 'The non-uniqueness of phonemic solutions of phonetic systems', in Martin Joos, ed., Readings in linguistics[3] 49 (New York, 1963).

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

4. Phonotactics

On the phonological level, a Chortí utterance is composed of one or more pause groups, each an uninterrupted sequence of one or more syllables bounded by actual exosyllabic pauses, and with or without an accompanying pitch contour.

The immediate constituents of a Chortí syllable are a stress, a nucleus, and in some syllables, an onset, a coda, or both.

A nucleus has a peak consisting of one or two vowels and sometimes / ? /, and some nuclei have one or more satellite vowels as well. The terms vowel and consonant used hereafter refer to symbols in linear notation, not at all to determinants. Thus, / ? / is a consonant, but GT is neither consonant nor vowel.

Only / i / and / u / are sometimes satellites. They are always satellites before or after / a, e, o /. They are sometimes satellites before / i / or / u / and a coda, or after an onset and / i / or / u /. They are sometimes satellites before / i / or / u / when the syllable contains neither onset nor coda, or when it contains both. In the table below, the satellite vowels are those over a wedge. The environments where / i / or / u / is sometimes a satellite are:

$\underset{\wedge}{ii}$	O$\underset{\wedge}{ii}$C	O$\underset{\wedge}{ii}$	$\underset{\wedge}{ii}$C
$\underset{\wedge}{iu}$	O$\underset{\wedge}{iu}$C	O$\underset{\wedge}{iu}$	$\underset{\wedge}{iu}$C
$\underset{\wedge}{ui}$	O$\underset{\wedge}{ui}$C	O$\underset{\wedge}{ui}$	$\underset{\wedge}{ui}$C
$\underset{\wedge}{uu}$	O$\underset{\wedge}{uu}$C	O$\underset{\wedge}{uu}$	$\underset{\wedge}{uu}$C

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

In any of these environments, both / i / and / u / are sometimes peaks. All other vowels, and / i / and / u / in all other environments, are always peaks.

The ultimate constituents which are the subject of phonotactic statements are the phonological components. Their distribution is summarized here by listing the attested immediate constituents of syllables — onsets, nuclei, and codas — in terms of the linear phonemic notation representing the determinants.

In the table of nuclei given below, the rows and columns where sequences of / i / and / u / appear provide an indication of which is peak and which is satellite. Although this information is not 'phonemic', it is included as a matter of interest. Thus, the sequences / ii /, / iu /, and / ui / occur twice each in the table.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Syllable Nuclei

1. One or Two Vowels

a	aa	ãã	ai	au	ia	ua
e	ee	ẽẽ	ei	eu	ie	ue
i	ii	ĩĩ		iu	ii	ui
o	oo	õõ	oi	ou	io	uo
u	uu	ũũ	ui		iu	

2. Three Vowels

uai	uau	iau	uio

3. Two Vowels and / ? /

a?a	ã?ã
e?e	ẽ?ẽ
i?i	ĩ?ĩ
o?o	õ?õ
u?u	ũ?u

4. Three Vowels and / ? /

a?ai		ia?a	ua?a
e?ei	e?eu	ie?e	ue?e
		ii?i	ui?i
o?oi		io?o	uo?o
		iu?u	

5. Four Vowels and / ? /

uia?a

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6. Three Vowels and / h /

Three nuclei are attested which are unlike all others in having an / h / as one constituent:

/ "iohi / 'droops over'

/ "iuhi / 'squash flower'

/ "huhi / 'dilute'

Phonetically the first two begin like the nucleus-and-coda types / ioh / and / iuh /, and end with a voiceless vowel [I] which is clearly distinct from the preceding [x^w] allophone of / h /. The presence of the spirant in the nucleus is not so remarkable when it is recalled that / ? /, a constituent of many nuclei, is the symbol for a determinant GT, with conditioned apertures of 0 and 1, and that / h / is the symbol for BIT. Both / ? / and / h / occur in onsets and nuclei, while / h / occurs in codas as well.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Syllable Onsets

1. One Consonant

p	t	k	?		
b	d	g			
m	n				
f	x	h	s	r	l

2. Two Consonants

?p	?t	?k		
pr	tr	kr		
br	dr	gr		
fr	sr	hr		
bl		gl	hl	
	ts			
	tx			

3. Three Consonants

?ts	?tx	?pr

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Syllable Codas

1. One Consonant

p	t	k			
m	n	ŋ			
	x	h	s	r	l

2. Two Consonants

?p	?t	?k		
hp	ht	hk		
hm	hn		hs	hr
		ŋk	ŋh	
	tx			
	ts			

3. Three or Four Consonants

?tx	?ts		
htx	hts	h?tx	h?ts
ntx	nts	n?tx	n?tx

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

5. Morphophonemics

Variations in the phonological shapes of morphemes are described in this section if they are neither determined by nor confined to a particular list of morphemes, but are instead subsumed by the general morphophonemic alternation formulae stated below. Alternations whose descriptive statement requires reference to a list of morphemes are described in the next chapter, on morphology. This division of the descriptive task is of course a revival of Bloomfield's distinction between his 'morphophonemic' and 'morpholexical' types of alternation.[1]

In accounting for variations in the phonemic shapes of morphemes, linguists commonly resort to allomorphs or morphophonemes as intervening variables. The allomorph, a morpheme-sized clump of phonemes, has generally been preferred to the morphophoneme, a phoneme-sized piece of a morpheme.

In Chortí, however, the combined effects of fusion and free variation are such that a description using either method alone would be needlessly complicated. Fusion leads to notorious difficulties of segmentation if the phoneme sequences of the language are segmented into allomorphs. Free variation requires a prohibitive increase in the number of morphophonemes in order to keep the shape of each morpheme constant in all environments.

I have therefore taken up a suggestion, first made by Floyd Lounsbury, to use both morpheme-sized and phoneme-sized variables.[3]

The use of morphophonemes offers well known advantages in dealing with fusion. 'The method of internal reconstruction

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

by-passes the problem of segmenting actual forms in a language of our type. In effect it sets up a fictitious agglutinating analog, such that a one-way transformation from the analog to the actual utterances is possible, and it segments that instead. This is a much easier task of segmentation -- as easy as segmenting the forms of an actually agglutinating language.'[4]

The method of morpheme alternants, on the other hand, is preferable when dealing with irregular morpholexical alternations, such as suppletion, or with certain types of free variation, provided that the difficulties of segmentation are not too severe.

The use of both methods in the description of a single language makes it possible to avoid the shortcomings of each.

In the discussion to follow, an <u>alternant</u> is a morpheme-sized clump of morphophonemes, paraphrasing Hockett, and a <u>morphophoneme</u> is a phoneme-sized piece of an alternant.

I employ Bloomfield's terms for <u>basic</u> and <u>derivative</u> <u>alternants</u>, while explicitly disclaiming any association they may have elsewhere with the prior and latter parts of a process, whether diachronic or synchronic. It should be clear that a 'basic' alternant is basic only to the statements of morphophonemic relations among alternants.

Many morphemes have only one alternant, while others have a number of morphemically conditioned <u>morpholexical</u> alternants. All <u>unconditional</u>, or unique, alternants, and all morpholexical alternants are <u>basic</u>, in the sense just specified. The terms

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

of one or more automatic or optional alternation formulae relate basic alternants to derivative alternants. Both basic and derivative alternants are sequences of morphophonemes.

Since most morphophonemic alternations in Chortí involve combinations of vowels, a basic alternant is usually one which occurs between consonants or pauses. These make up a body of clear cases. The alternation formulae which account for them were also used, in the familiar way, in deciding which of several alternants of certain morphemes was to be taken as basic: the choice was made to fit the formulae when possible.

When the basic alternants of the morphemes of a Chortí constitute end or begin with a vowel or with H adjacent to a vowel, so that a vowel or vowel-and-H sequence is interrupted by a morphological boundary, there is considerable variation of the phonemic shapes of the constitute. This variation is both frequent and free, in that the occurrence of one particular variant is not conditioned by any linguistic elements in the environment. Nevertheless, it is orderly, since the variant phonemic shapes of any constitute are specifiable by general morphophonemic formulae.

These formulae, although established to account for clear cases, overlap or conflict in certain other cases. The alternative possibilities in the areas of overlap and conflict account for the variant phonemic shapes.

Something of the nature and amount of free variation in Chortí texts is shown by selected examples of OTOT 'house' which

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

follow. Under the basic alternants and glosses of three constitutes are grouped the phonemic shapes of the constitute which are attested, and after each, a numeral in parentheses showing how many examples of that particular shape are found in the corpus. All shapes of these constitutes are given, though not all examples of OTOT are of interest in this connection.

After each phonemic shape, I indicate which formulae apply in the generation of that shape. The formulae are found, together with additional examples, in sections 5.2 and 5.4.

For convenience, most # symbols are replaced by a single space in examples, but are retained in formulae, or wherever clarity is served by their use. It should be noted then, that in morphophonemic notations, the presence of # and of single space are exactly equivalent.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Examples of OTOT 'house'

1. #'TA#'U+#'O"TOT# 'to his house'

'ta'u'io"tot	(3)	None.
'tu?u'io"tot	(1)	Assimilation, Onset, Weight.
'tu'io"tot	(3)	Assimilation, Reduction, Onset.

2. #'E#'O"TOT# 'the house'

'e'o"tot	(1)	None.
'e'io"tot	(2)	Raising.
'i'o"tot	(1)	Raising.
'io"tot	(5)	Raising, Weight.
'io?o"tot	(2)	Raising, Breaking, Weight.

3. #'TA'MA#'E#'O"TOT# 'in the house'

'ta'me?e'o"tot	(1)	Assimilation, Weight.
'ta'mo?o"tot	(3)	Reduction, Assimilation, Weight.
'ta'me'o"tot	(1)	Reduction, Weight.
'ta'mi'o"tot	(1)	Reduction, Raising, Weight.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Once the variation in phonemic shapes is shown to be orderly, and its range is specified, then it is reasonable to ascribe differences in relative frequencies of shapes to stylistic factors within an idiolect, or to these and dialectal differences among idiolects. A few remarks are offered on these subjects in this chapter.

In general the speakers I observed tended to display more complex morphophonemic alternations in informal situations, compared to the less frequent and less complex alternations of more formal styles of speech. My principal informant used the same narrative style for texts as he used for sermons. This style is characterized by slow, solemn diction with frequent pauses and infrequent reduction of vowel sequences.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

5.1 Morphophonemic Notation

Though both systems are linear, the morphophonemic notation defined here differs from the phonemic in two respects: first, the morphophonemic notation includes a symbol # which indicates morphological boundaries, but which never has a phonemic shape, and second, it is not biunique, since more than one sequence of morphophonemes will correspond to certain phoneme sequences. Both {AV} and {AA}, for example, correspond to both / aa / and / a?a /.

Some morphophonemes — for example, those with more than one phonemic correspondent — occur only in basic alternants, while others, such as { N }, occur only in derivative alternants. Most, of course, occur in alternants of both kinds.

One convention followed in the morphophonemic notation of individual examples is not handled as a morphophonemic alternation, but as a variation in the phonemic shapes corresponding to geminate morphophonemic vowels. The second vowel of such pairs, and any following vowel in that syllable, is phonemically glottalized or not. Some informants always glottalize such a nucleus, others never do, and most glottalize them some of the time. There is no corresponding variation in the phonemic shapes of glottalized consonants or consonant clusters.

In the morphophonemic transcription of Chortí examples, I have chosen to write no { ? } between vowels. The presence or frequency of / ? / in this class of environments is left as a subject for dialectal and stylistic investigation. Sequences

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

such as { U+ NAAT A } 'he knows' and { MA ANI } 'it wasn't' are phonemically / 'u'na?a"ta / and / 'ma?a"ni / most of the time, but are occasionally attested as / 'u'naa"ta / and / 'maa"ni /. This convention has important descriptive advantages, since there would be no grounds for assigning { ? } in *{ MA ? ANI } to either alternant.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Morphophonemes and Phonemic Correspondents

P	p	F	f	M	m
T	t	X	x	N	n
K	k	H	h	N	ŋ
?	?	S	s		
B	b	R	r		
D	d	L	l		
G	g	#	none		

A	a	Ã	ã
E	e	Ẽ	ẽ
I	i	Ĩ	ĩ
O	o	Õ	õ
U	u	Ũ	ũ

+	gu, u, i
V	a, e, i, o, u ã, ẽ, ĩ, õ, ũ
J	h, a, e, i, o, u

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Symbols Used in Formulae

=	'automatically alternates with'
≈	'alternates with'
#	'morphological boundary'
1	A, E, I, O, U, V peaks
2	A, E, I, O, U, V peaks
1̃	Ã, Ẽ, Ĩ, Õ, Ũ, Ṽ peaks
C	Any consonant, cluster, or satellite

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

5.2 Alternations of Stress Morphophonemes

There are alternations in the position of onset, length of span, and degree of stress which are coordinate with other morphophonemic alternations. They are most easily studied in the absence of other alternations, as in the following examples, but they are also observable throughout the lists of examples in this chapter.

Most basic alternants include one or more stresses as part of their morphophonemic shape. These are the basis of the derivative alternants whose phonemic shapes are illustrated below. Alternations of position of onset are automatic, while the optional alternations of span and degree are grouped below under the rubric weight.

Variables 1 and 2 stand for any of peak A, E, I, O, U or V, here as elsewhere. The H, N, #, ', and " are morphophonemes. The symbol = means 'automatically alternates with', and ≃ means 'alternates with'. The C stands for any consonant, consonant cluster, or satellite vowel. The ! in the onset formulae means ' or " :

Onset	1HC#!2	=	1H!C#2
	1NC#!2	=	1N!C#2
	1NHC#!2	=	1NH!C #2
	1C#!2	=	1!C#2
Weight	# ' # "	≃	# " #
	# " # '	≃	# " #
	# ' # '	≃	# ' #

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Onset Formulae

Basic Alternants	Phonemic Shapes of Derivatives	Glosses
1HC#!2	1H!C#2	
'HU H T "A	'huh"ta	cooled off
'KOHN "O?P	'koh"no?p	creeks
'?KU H X "A	'?kuh"xa	it was bitten
'A 'OHR "I	'o?oh"ri	he falls
'A 'HA H ?ts "A	'a?ah"?tsa	it is punished
1NC#!2	1N!C#2	
'VN+ 'IR "A	'iŋ'gui"ra	I see it
'A 'VN+ TX "I *	'a?an"txi	I raise it
'O 'VN ?P "I *	'o?om"?pi	I cover it
'A 'VN+ ?TS "I *	'a?an"?tsi	I punish it
'U 'VN ?TX "U *	'u?un"?txu	I grind it
1NHC#!2	1NH!C#2	
'O 'VN HR "I	'o?oŋh"ri	I fall
'U 'VN H T "A *	'u?uŋh"ta	I am cooled
'O 'VN H ?P "A *	'o?oŋh"?pa	I am covered
'I 'VN H ?T "A *	'i?iŋh"?ta	I am bound
'A 'VN H ?TS "A *	'a?aŋh"?tsa	I am punished
1C#!2	1!C#2	
'?KUX "V	'?ku"xu	eat!
'U+ 'AS "I	'u'ia"si	he plays it
'?TAA?P "VI	'?ta?a"?pai	he jumped up
'U+ 'KUTX "I	'u'ku"txi	he carries it
'U+ 'HA?TS "I	'u'ua"?tsi	he punishes it

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Weight Formulae

Basic Alternants	Phonemic Shapes of Derivatives	Glosses
# ' # "	# " #	
'U+ 'IR 'NA "AR	'u'uir"na?ar	his appearance
'U+ 'IR 'SE "EN	'u'uir"se?en	he sees me
'U+ '?KUX 'I "IK	'u'?ku"xi?ik	let him bite it
'U+ 'KOHK 'O "ON	'u'koh"ko?on	he watches us
U+ "HU?T	"u?u?t	his eyeball
# " # '	# " #	
'TU"?KA 'A+ 'NUM "SE	'tu"?ka?a'num"se	what you made to happen
'U+ 'AAR "E 'E 'UI"NIK	'u'ia?a"re?e'ui"nik	he addresses the man
'U+ 'NAM "I 'I+ "HU?T	'u'na"mi?i"u?ut	he made you (pl) disappear
'KAN "O 'OHR "ON	'ka"no?oh"ron	he learned to speak
'U+ 'AH?K "U 'U+ 'TU"MIN	'u'iah"?ku?u'tu"min	he gave his money
# ' # '	# ' #	
'KA 'AT "I	'ka?a"ti	we bathe
'E 'EH"?TSAK	'e?eh"?tsak	the fingernail
'I 'IR "NA	'i?ir"na	you (sg) are seen
'E "MIS'MO 'OHR 'ON "ER	'e"mis'mo?oh'ro"ner	the same story
'U+ 'U?TX "I	'u?u"?txi	he drinks it

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

5.3 Alternations Involving Consonant Morphophonemes

There is a discussion of the A prefixes and of the regular and hybrid U prefix paradigms below, in section 6.21. The first person singular of the A prefixes and of the hybrid U prefix paradigm is { VN }. The first person singular of the U prefixes is { VN+ }.

When one of these alternants occurs with a stem beginning with a vowel or with { H } before a vowel, automatic and optional alternations of considerable complexity take place. Their starting point is one of these morphophoneme sequences:

VN#1	VN+#1
VN#H1	VN+#H1

Each of these morphophonemes is involved in at least one alternation. Because of the alternations involving permutation and nasalization, discussed immediately below, the alternations of { V } are taken up here rather than in section 5.4. All the alternations discussed here except those involving { J } have some connection with first person prefixes.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

1. Permutations of { VN }

There is an automatic permutation of { VN } first person alternants as follows:

VN#1	=	1#VN
VN#E1	=	1#VN

This permutation takes place whether the alternant belongs to the A or the U paradigm. Note, however, that it does not involve the { VN+ } alternant of the U paradigm, the { VN+ } 'one' numeral prefix, or the { IN } 'attributive' prefix. The rule stated above does not apply to any of these alternants.

Two examples, both A prefixes, will show the relationships of forms:

Roots	AT	HATX
Basic Alternants	VN AT I	VN HATX PA
Derivative Alternants	A VN T I	A VN TX PA
Phonemic Shapes	'a?an"ti	'a?antx"pa
Glosses	I bathe	I raise myself

Derivative alternants like these are the starting point for the next two alternations to be discussed.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

2. Nasalized Vowels

Chortí nasalized vowels occur only in first-person singular forms. They correspond to the derivatives of these alternations, when C is any consonant:

1#VN#C	≈	Ĩ#VN#C
1#VN#C	≈	Ĩ#V#C

The Ĩ is a digraph made up of 1 and ~. This ~ is not a morphophoneme, but rather, a diacritic of one of the formulaic variables. The digraph Ĩ stands for any of Ã, Ẽ, Ĩ, Õ, or Ũ, depending on the value of 1 in the basis. It will be recalled that 1 stands for any of A, E, I, O, U, or V.

One example of each type follows:

Roots	OHR	IR
Basic Alternants	VN OHR I	VN IR NA
Automatic Derivative Alternants	O VN HR I	I VN R NA
Optional Derivative Alternants	Õ VN HR I	Ĩ V R NA
Phonemic Shapes	'õ?õŋh"ri	'ĩ?ĩr"na
Glosses	I fall	I am seen

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

3. Alternations of { V }

Within a pause group, V alternates so as to assimilate to the preceding peak vowel, whether in the same or the preceding syllable. The peak vowel is defined in the phonotactics section above. If no peak precedes V in a pause group, V is I. The alternation, in formal terms, is:

V = I after peak I or as first peak,

V = A after peak A,

V = E after peak E,

V = O after peak O,

V = U after peak U,

V = Ĩ after peak Ĩ,

V = Ã after peak Ã,

V = Ẽ after peak Ẽ,

V = Õ after peak Õ,

V = Ũ after peak Ũ.

Two examples of V are given for each of the ten alternations above. A basic or derivative morphophonemic antecedent is to the left of each. Note that some examples appear with and without nasalized vowels, and that some of the nasalized geminates are not glottalized.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Morphophonemics	Phonemics	Glosses
VN+ ?KAN I	'iŋ'?ka"ni	I want it
VN+ IO?P I	'in'io"?pi	I strike it
I VN H ?T A	'i?iŋh"?ta	I am bound
I VN R I	'i?iŋ"gri	I rest
A VN T I	'a?an"ti	I bathe
A VN S I	'a?an"si	I play
E VN H ?K A	'e?eŋh"?ka	I am spread out
E VN ?K PA	'e?eŋ?k"pa	I split open
O VN+ ?P I	'o?om"?pi	I wrap it
O VN HR ON	'o?oŋh"ron	I tell
U VN+ ?TX I	'u?un"?txi	I drink it
U VN ?TX U	'u?un"?txu	I grind
Ĩ V R NA	'ĩ?ĩr"na	I am seen
Ĩ VN H ?T A	'ĩ?ĩŋh"?ta	I am bound
Ã VN TX PA	'ã?ãntx"pa	I raise myself
Ã V KN I	'ããk"ni	I weed
Ẽ V R PA	'ẽẽr"pa	I become worse
Ẽ V R P ES	'ẽ?ẽr"pes	I make myself worse
Õ VN HR I	'õ?õŋh"ri	I fall
Õ V HR ON	'õõh"ron	I speak
Ũ VN H T A	'ũ?ũŋh"ta	I am cooled
Ũ VN+ ?TX RV	'ũ?ũn?ɨx"ru	I rub it

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

4. Alternations of { + }

This morphophoneme only occurs in alternant-final positions:

Basic	=	Derivative	After	Before
+#	=	GU#	N	A, E, I, HA, HI
+#	=	U#	A, I	A, E, I, HA, HI
			U	I, HA, HI, HO
+#	=	I#	U	A, E, O, U
+#	=	#	A, I	O, U, HA, HO
				HU, Consonants

The examples which follow show the alternations stated above: first, those before a vowel, then, those before H and a vowel.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

{ + } Before a Vowel

Morphophoneme Sequence	Basic Alternants	Phonemic Shape	Gloss
N+ A	VN+ AH?K U	'iŋ'guah"?ku	I give it
A+ A	A+ AH?K U	'a'uah"?ku	you (sg) give it
I+ A	I+ AH?K U	'i'nah"?ku	you (pl) give it
U+ A	U+ AH?K U	'u'iah"?ku	he gives it
N+ E	VN+ ER P ES	'iŋ'guer"pes	I worsen it
A+ E	A+ ER P ES	'a'uer"pes	you (sg) worsen it
I+ E	I+ ER P ES	'i'uer"pes	you (pl) worsen it
U+ E	U+ ER P ES	'u'ier"pes	he worsens it
N+ I	VN+ IR A	'iŋ'gui"ra	I see it
A+ I	A+ IR A	'a'ui"ra	you (sg) see it
I+ I	I+ IR A	'i'ui"ra	you (pl) see it
U+ I	U+ IR A	'u'ui"ra	he sees it
N+ O	VN OHR I	'o?oŋh"ri	I fall
A+ O	A+ OTOT	'o?o"tot	your (sg) house
I+ O	I+ OTOT	'io?o"tot	your (pl) house
U+ O	U+ OTOT	'u'io"tot	his house
N+ U	VN+ U?TX I	'u?un"?txi	I drink it
A+ U	A+ U?TX I	'o?oi"?txi	you (sg) drink it
I+ U	I+ U?TX I	'iu?u"?txi	you (pl) drink it
U+ U	U+ U?TX I	'u'iu"?txi	he drinks it

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

{ + } Before H and a Vowel

Morphophoneme Sequence	Basic Alternants	Phonemic Shape	Gloss
N+ HA	VN+ HA?TS I	'a?an"?tsi	I beat it
A+ HA	A+ HA?TS I	'a?a"?tsi	you (sg) beat it
I+ HA	I+ HA?TS I	'ia?a"?tsi	you (pl) beat it
U+ HA	U+ HA?TS I	'u'ua"?tsi	he beats it
N+ HI	VN+ HIR VH SE	'iŋ'gui'rih"se	I bring it to rest
A+ HI	A+ HIR VH SE	'a'ui'rih"se	you (sg) bring it to rest
I+ HI	I+ HIR VH SE	'i'ui'rih"se	you (pl) bring it to rest
U+ HI	U+ HIR VH SE	'u'ui'rih"se	he brings it to rest
N+ HO	VN+ HO?P I	'o?om"?pi	I wrap it
A+ HO	A+ HO?P I	'o?o"?pi	you (sg) wrap it
I+ HO	I+ HO?P I	'io?o"?pi	you (pl) wrap it
U+ HO	U+ HO?P I	'u'uo"?pi	he wraps it
N+ HU	VN+ HU?TX RV	'u?un?tx"ru	I grind it
A+ HU	A+ HU?TX RV	'o?oi?tx"ru	you (sg) grind it
I+ HU	I+ HU?TX RV	'iu?u?tx"ru	you (pl) grind it
U+ HU	U+ HU?TX RV	'u?u?tx"ru	he grinds it

No examples of roots beginning with HE and occurring with U- prefixes are attested. This is almost certainly due merely to the low frequency of E as a radical vowel, and not to any systematic factors.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

5. Alternations of { H }

Morphophonemic H is regularly lost adjacent to a morphological boundary between vowels. The alternation is:

1#H2	≈	1#2
1H#2	≈	1#2

when 1 and 2 are any of A, E, I, O, U, or V, and # marks the morphological boundary. These paradigms of the root HUHI 'dilute' are of the U- prefix type. The third-persons mean 'he dilutes it':

'iŋ'huh"iu	'ka'huh"iu	'u?uŋh"iu	'ko?oh"iu
'a'huh"iu	'i'huh"iu	'o?oh"iu	'iu?uh"iu
'u'huh"iu		'u?uh"iu	

The left-hand paradigm is the regular type, and the right-hand one the hybrid type. This difference is clear only in the first-person singular, where the absence of a { + } in the hybrid form is shown by the automatic permutation of the personal affix, with an automatic loss of H. In the other four persons of the hybrid paradigm, the loss of H is optional: compare the two third-person forms, which are morphophonemically identical.

Since there is an automatic loss of { + } before HU, all but the first-persons singular of <u>both</u> paradigms fit the alternation formula just given above, with H after a morphological boundary and between vowels.

One root is always attested with initial H, perhaps for

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

onomatopoetic value: HIIK 'whoosh' is as follows:

'iŋ'hi?ik"na 'ka'hi?ik"na

'i'hi?ik"na 'ix'hi?ik"na

'a'hi?ik"na

These forms have the A- prefixes. The third-person means 'it whooshes'.

Examples of H before a boundary are not common. Compare these examples of the root ?TXIH 'grow', in its A- stem and causative forms, and the animate prefix AH, with vowel and consonant initial stems:

Basic Alternants	A ?TXIH I	U+ ?TXIH SE
Phonemic Shapes	'a"?txi?i	'u'?txih"se
Glosses	it grows	he grows it
Basic Alternants	AH AT ER	AH NAHT IR
Phonemic Shapes	'a?a"ter	'ah'nah"tir
Glosses	bather	stranger

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6. Alternations of { N }

Morphophonemic N alternates before consonants as follows:

N ≈ M before P, ?P, B, M

N ≈ N before K, ?K, G, H, R

The assimilated forms, like / 'im'ma"ni / 'I buy it' are more frequent than the unassimilated / 'in'ma"ni / type. Other examples of the assimilated alternants are:

'im'pat"na	I work
'im'?pa?a"xe	I curse it
'im'bo'to"ni	I button it
'iŋ'ka"ni	I learn it
'iŋ"?kihn	hot
'iŋ'gui"ra	I see it
'iŋ'hi?ik"na	I whoosh
'e?eŋ"ron	I see

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

7. Alternations of { J }

A few roots are attested where there is automatic alternation of a single vowel and / h / in syllable final position with a geminate vowel in syllable nonfinal position. Two such roots are PAJN 'dig' and PAJ?K 'implant':

'a'pah"no	he digs
'a'pa?aŋ"ua	it is dug
'a'pah"?ka	he implants
'a'pa?a?k"ma	he's an implanter

These roots contain a J, whose alternation is formulated as follows:

J = H before ' or "

J = A after A, not before ' or "

No examples of J after vowels other than A are attested.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

8. Alternations of { R }

There are two alternations of R after nasals. The first is automatic:

N#R = N#L

TAN RUM	'tan"lum	ash-earth, dust
A TXAN RE	'a'txan"le	he watches

The second alternation is optional. It has as its basis the derivative of the N ≈ N before R alternation discussed above. The further alternation is:

N#R ≈ N#GR

E EN R ON *	'e?eŋ"gron	I look

The combined effect of these three formulae is to preclude the possibility of an / nr / sequence.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

5.4 Alternations of Vowel Morphophonemes

Most alternations of vowel morphophonemes involve a reduction in the number of syllables, and some, a reduction in the number of vowels. If either of two given syllables is strongly stressed, the resulting syllable is strongly stressed. These weight formulae were stated in algebraic form above.

Each of the vowel alternation formulae is optional, and there is no fixed order of application.

The symbol # indicates morphological boundaries, ≈ means 'alternates with', and 1 and 2 are any of peak A, E, I, O, U, or V. Thus, a sequence 12 stands for any two of these, whether like or unlike. The values of 1 and 2, whatever they are, remain the same within a formula. The left part of a formula is the basis, the right part the derivative, and ≈ and = are relations.

Formulae for Alternations of Vowels

Assimilation	1#2	≈	2#2		
Reduction	1#2	≈	#2		
Raising	E#1	≈	EI#1	≈	I#1
	O#1	≈	OU#1	≈	U#1
Breaking	I#1	≈	I1#1		
	U#1	≈	U1#1		
	A#1	≈	E#EI	≈	E#E
	A#U	≈	O#O		

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

The use of rule-like formulae and of the symbols ≈ and = as relations suggest a process view of morphophonemics. What is intended, however, is nothing more than a compact expression of the relationships holding among the alternants of a great many Chortí morphemes. It is more compact to read off the assimilation formula as 'final 1 alternates with final 2 before initial 2', for example, than as 'some alternants of a morpheme whose basic alternant ends in A and instead in E before an alternant of a morpheme whose basic alternant begins in E', particularly since the latter must be repeated for thirty-five other combinations of vowels which are covered by the former, shorter expression. The longer reading is acceptable too, of course, beginning 'some' when ≈ is the relation, and 'all' when = is used in the formula.

The position of # in the derivative of each formula reflects a policy of segmenting so as to confine alternations to one or the other of two adjoining alternants whenever possible. This has been achieved in all but a few of the formulae, where terms on both sides of the # are different in the derivative. In such cases, the position of # is unimportant.

A list of examples follows which, although organized according to the formulae for alternations of vowel sequences just listed, contains numerous examples of other alternations, both automatic and optional.

The # symbol appears in headings but not in examples. Both basic and derivative alternants are included in the list

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

of examples. Derivative alternants are marked by an * at the right of the basis column, and are repeated in a list at the end of this section, opposite their basic alternants.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

1. Assimilation

Bases	Phonemic Shapes of Derivatives	Glosses
A A	a?a	
MA ANI	'ma?a"ni	it wasn't
A AS I	'a?a"si	he plays
A AT I	'a?a"ti	he bathes
A E	e?e	
TA KA E SAPO	'ta'ke?e"sa'po	with the toad
TA MA E MUAN	'ta'me?e"muan	with the hawk
U+ ?TXIITX ?PA EN	'u'?txi?itx"?pe?en	he hurt me
A I	i?i	
KETPA IX	'ket"pi?ix	he stayed
U+ NAAT A IX	'u'na?a"ti?ix	he had thought
U+ ?TSAK A IK	'u'?tsa"ki?ik	let him cure it
A O	o?o	
U+ IR A ON	'u'ui"ro?on	he saw us
A OHR I	'o?oh"ri	he falls
VN+ AKT A OX	'iŋ'guak"to?ox	I leave you (pl)
A U	u?u	
TA U+ OTOT	'tu?u'io"tot	to his house
U+ AKT A U+ ?PA	'u'iak'tu?u"?pa	he let himself
AH?K U NA U+ LAP I	'ah'?ku"nu?u'la"pi	he was given them to wear

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Assimilation, cont.

E A	a?a	
U+ ?KETX E A XAN A	'u'?ke"txa?a'xa"na	he carried it away
U+ TXE AUANT AR	'u'txa?a'uan"tar	he couldn't stand it
A+ NUM SE A+ ?PA	'a'num"sa?a"?pa	it happens to you
E E	e?e	
U+ TXAM SE EN	'u'txam"se?en	he killed me
TXE E TXUMPII	'txe?e'txum"pi?i	said the turkey
U+ ?PAJK RE ET	'u'?pa?a"kre?et	he feared you
E I	i?i	
U+ XER E IK	'u'xe"ri?ik	let him cut it
A+ TXE IX	'a"txi?ix	you've done it
KA+ XER E IX	'ka'xe"ri?ix	we've cut it
E O	o?o	
U+ TXE ON	'u"txo?on	he made us
VN+ TXE OTOT IR A	'in'txo?c"to'ti"ra	I built that house
E U	u?u	
U+ AAR E U+ KOMPAGRE	'u'ia?a"ru?u'kom"pa'gre	he told his friend
U+ NUM SE U+ ?PA	'u'num"su?u"?pa	he got along with him
U+ LO?K SE U+ NU?K	'u'lo?k"su?u"nu?k	it came out their necks

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Assimilation, cont.

I A	a?a	
?KAN I ANI A VXI N	'?ka'na?a'na?a"xin	he meant to go
MA ATXI ANI	'ma?a"txa?a"ni	he wasn't
MA ATXI A ?KO?T VI	'ma?a'txa?a'?ko"?toi	he didn't come
I E	e?e	
U+ ?KUX I EN	'u'?ku"xe?en	he bit me
MA ATXI VXI EN	'ma?a"txi?i"xe?en	I didn't go
U+ TXUK I E KONEHO	'u'txu"ke?e'ko"ne'ho	he catches the rabbit
I I	i?i	
U+ ?KUX I IK	'u'?ku"xi?ik	let him bite
MA ATXI IX	'ma?a"txi?ix	nothing
U+ ?TSAK I IK	'u'?tsa"ki?ik	let him add to it
I O	o?o	
VXI ON	'i"xo?on	we went
VXI OX	'i"xo?ox	you (pl) went
I U	u?u	
U+ IO?P I U+ ?PA	'u'io"?pu?u"?pa	he hit himself
?KAN I U+ TAHU I	'?ka"nu?u'tah"ui	he wanted to find it
MA ATXI U+ NAAT A	'ma?a"txu?u'na?a"ta	he didn't know

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Assimilation, cont.

O A	a?a	
KAI TO ANI	'kai"ta?a"ni	as it was beginning
O E	e?e	
?KO?T O E KOMPAGRE *	'?ko'?te?e'kom"pa 'gre	the friend arrived
PERO E ?KE?TXUH	'pe're?e'?ke"?txuh	but the sesimite
O I	i?i	
HO?TS O IK	'ho"?tsi?ik	pull it out!
U+ XOHX O IK	'u'xoh"xi?ik	let him poke
O O	o?o	
MISMO OHR ON ER	"mis'mo?oh'ro"ner	same story
KAN O OHR ON	'ka"no?oh"ron	he learned to talk
O U	u?u	
MA ATXI IX TO U+...	'ma?a'txix"tu?u...	there was no...
AIAN TO U+...	'a'ian"tu?u...	there is...

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Assimilation, cont.

U A	a?a	
TUR U ANI	'tu"ra?a"ni	there he was
U E	e?e	
U+ AH?K U EN	'u'iah"?ke?en	he gave me
TUR U EN	'tu"re?en	there I am
NUM U EN *	'nu"me?en	I passed
U I	i?i	
TUR U IX	'tu"ri?ix	he was there
U O	o?o	
VN+ AH?K U OX	'iŋ'guah"?ko?ox	I gave you (pl)
NUM U ON *	'nu"mo?on	we passed
TUR U ON	'tu"ro?on	there we are
U U	u?u	
U+ HUUR U+ HU?T	'u'hu?u"ru?u?t	he ploughed it
U+ AH?K U U+...	'u'iah"?ku?u...	he gave his...

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

2. Reduction

Bases	Phonemic Shapes of Derivatives	Glosses
A A	a	
KONDA AH?K U NA	'kon'dah"?ku"na	when he was given it
U+ NAAT A AH?K U NA	'u'na?a"tah'?ku"na	he believes it was given
A E	e	
KOTXA E VN+ TEE	'ko'txe'in"te?e	like the one
U+ ?PA E UINIK	'u'?pe'ui"nik	the man's body
U+ IR A ET O?P	'u'ui're"to?p	they see you
A I	i	
TU?KA IX TO	'tu'?kix"to	then what
IR A I A?TX PA	'i"ria?a?tx"pa	don't get up!
TAKA I A?K?P AR *	'ta'kia?k"?par	with the night
A O	o	
A KOR MA O?P	'a'kor"mo?p	they hunt
A U	u	
I IOOP A U+ ?PAN	'i'io?o'pu"?pan	you (sg) arrived too
U+ AKT A U+ ?PA	'u'iak'tu"?pa	he let himself
TXEK TA U+ IU?P I	'txek"tu'iu"?pi	he came to hear it

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Reduction, cont.

E A	a	
U+ TXE AUANT AR	'u'txa'uan"tar	he endures
A+ IR SE A+ HU?T	'a'uir"so?oit	you showed yourself
E E	e	
KOTXE E MUAN *	'ko'txe"muan	like the hawk
TXE ENTONSES	'txen"ton'ses	then he said
E I	i	
A?K?P AR E IX	'a?k'?pa"rix	night had fallen
E O	o	
U+ ?KETX E O?P	'u'?ke"txo?p	they carried it
U+ TXE O?P	'u"txo?p	they did it
E U	u	
XE U+ AH?K U EN	'xu'iah"?ke?en	which he gave me

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Reduction, cont.

I A	a	
?KAN I A LO?K VI	'?ka"na'lo"?koi	he wanted to leave
U+ IU?P I AII	'u'iu'?pa"ii	he heard it there
I E	e	
U+ ?KUX I EN	'u'?ku"xen	he bit me
I I	i	
MA ATXI IX TO	'ma?a'txix"to	there still wasn't
MA ATXI IN+ IR A *	'ma?a'txiŋ'gui"ra	I don't see it
?KAN I IN XAN A *	'?ka'nin'xa"na	I mean to go
I O	o	
U+ ?KUX I O?P	'u'?ku"xo?p	they bit it
I U	u	
MA ATXI U+ ?KAN I	'ma?a"txu'?ka"ni	he didn't want it
MA ATXI U NAAT A	'ma?a'txu'na?a"ta	he didn't know

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Reduction, cont.

O A	a	
O E	e	
U+ KOHK O E A?KATX	'u'koh'kia?a"?katx	he watched the chickens
O I	i	
POR ESO IX TO	'po"re'six"to	and so
O O	o	
U+ KOHK O O?P	'u'koh"ko?p	they watched
OTRO ON+ TEE *	'o'tron"te?e	another one
O U	u	
U+ KOHK O U+ IR A	'u'koh"ku'ui"ra	he waited and watched
SEPARADO U+ OTOT	'se'pa"ra'du'io"tot	his house was apart
U A	a	
U E	e	
TUR U E KA+ TATAA	'tu're'ka'ta"ta?a	where our father is
U I	i	
U O	o	
TUR U O?P	'tu"ro?p	they live there
U U	u	
TUR U U+ SUI U+ OK	'tu'ru"sui'u"iok	where her heel is

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

3. Raising

Bases	Phonemic Shapes of Derivatives	Glosses
E A	eia	
TAMA E ALDEIA O?P	'ta'me'ial'de"io?p	in the villages
E E	eie	
E I	eii	
TXE IAH	'txei"iah	construction
E O	eio	
E OTOT	'e'io"tot	the house
E U	eiu	
E A	ia	
TAKA E A?K?P AR	'ta'kia?k"?par	with the night
VN+ TXE AUANT AR	'in"txia?a'uan"tar	I endure
E A?KATX	'i'a"?katx	the chicken
E E	ie	
TXAN RE EN IX	'txan'lie"nix	I watched
VN+ AAR E ET	'iŋ'gua?a"riet	I told you
?KETX E EN	'?ke"txien	carry me!
E I	i?i	

See Assimilation.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Raising, cont.

E O	io	
E OTOT	'io"tot	the house
TE O?P *	"tio?p	trees
VN+ TXE OTOT *	'in'txio"tot	I built the house
E U	**iu**	
U+ TXE U+ OTOT O?P	'u'txiu'io'to"to?p	they built the houses
POR KE U+ NAAT A	'por'kiu'na?a"ta	because he knew
U+ MEN E USIH	'u"me'niu"sih	by the buzzard
O A	**ua**	
AH KAN O AR O?P	'ah'kan'ua"ro?p	the students
O E	**ue**	
LOKO EN	'lo"kuen	I'm crazy
AMIGO EN	'a"mi"guen	I'm a friend
OTX O EN *	'o"txuen	I entered
O I	**ui**	
POR ESO IX TO	'po"re'suix"to	and so
VN KAN O IX	'iŋ'ka"nuix	I'm learning
O O	**uo**	
U+ KOHK O O?P	'u'koh"kuo?p	they watch
A PAJN O O?P	'a'pah"nuo?p	they dig
LO?K O O?P *	'lo"?kuo?p	they left
O U	**uu**	

See Assimilation

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

4. Breaking

Bases	Phonemic Shapes of Derivatives	Glosses
I A	ia?a	
I AHN I	'ia?ah"ni	you run
I AS I	'ia?a"si	you play
I AÑAM *	'ia?a"nam	the mud
I E	ie?e	
U+ TXAP I EN	'u'txa"pie?en	he cooked me
I ER PA	'ie?er"pa	you get worse
U+ TXAM SI ET *	'u'txam"sie?et	he killed you
I I	ii?i	
I IR NA	'ii?ir"na	you are seen
I O	io?o	
I OHR I	'io?oh"ri	you fall
I OTX VI	'io?o"txoi	you enter
U+ AAR I ON *	'u'ia?a"rio?on	he told us
I U	iu?u	
I U?TX I	'iu?u"?txi	you drink
I U+ UEE ER IR	'iu?u'ue?e"rir	and his flesh

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Breaking, cont.

U A	ua?a	
AH PAHR U AR *	'ah'pah"rua?ar	carpenter
U E	ue?e	
NUM U ET *	'nu"mue?et	you (sg) passed
U+ AH?K U E TUMIN	'u'iah"?kue?e'tu"min	you gave him the money
U+ KOHK U EN O?P *	'u'koh'kue?e"no?p	they took care of me
U I	ui?i	
U+ HUUR U IK	'u'hu?u"rui?ik	let him dig
VN KU IK *	'iŋ"kui?ik	let's go
U O	uo?o	
A ?KAH?P U ON	'a'?kah"?puo?on	you (sg) receive us
NUM U OX *	'nu"muo?ox	you (pl) passed
U U	uu?u	
U+ TAHU U ?PA O?P *	'u'tah'uu?u"?po?p	they found themselves

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Breaking, cont.

A I	e?ei	
KA I H ?T A *	'ke?eih"?ta	we're tied up
A IR I *	'e?ei"ri	he rests
A I	e?e	
A IR NA	'e?er"na	he is seen
A U	o?oi	
TIKA A+ HU?T *	'ti"ko?oi?t	in front of you
A U?TX NA	'o?oi?tx"na	it is drunk
A+ U?TX I	'o?oi"?txi	you (sg) drink it
A U	o?o	
A U?TX NA	'o?o?tx"na	it is drunk
KA UR I *	'ko?o"ri	we shoot it

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Derivative Alternants	Basic Alternants
page 102:	
'A 'VN+ TX "I	'VN+ 'HATX "I
'O 'VN ?P "I	'VN 'HO?P "I
'A 'VN+ ?TS "I	'VN+ 'HA?TS "I
'U 'VN ?TX "U	'VN 'HU?TX "U
'U 'VN H T "A	'VN 'HU H T "A
'O 'VN H ?P "A	'VN 'HO H ?P "A
'I 'VN H ?T "A	'VN HI H ?T "A
'A 'VN H ?TS "A	'VN 'HA H ?TS "A
page 123:	
?KO?T O E KOMPAGRE	?KO?T VI E KOMPAGRE
page 124:	
NUM U EN	NUM VI EN
NUM U ON	NUM VI EN
page 125:	
TAKA I A?K?P AR	TAKA E A?K?P AR
page 126:	
KOTXE E MUAN	KOTXA E MUAN
page 127:	
MA ATXI IN+ IR A	MA ATXI VN+ IR A
?KAN I IN+ IR A	?KAN I VN+ IR A
page 128:	
OTRO ON+ TEE	OTRO VN+ TEE

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

page 130:

TE O?P	TEE O?P
VN+ TXE OTOT	VN+ TXE E OTOT
OTX O EN	OTX VI EN
LO?K O O?P	LO?K VI O?P

page 131:

I ANAM	E ANAM
U+ TXAM SI ET	U+ TXAM SE ET
U+ AAR I ON	U+ AAR E ON

page 132:

AH PAHR U AR	AH PAHR O AR
NUM U ET	NUM VI ET
U+ KOHK U EN O?P	U+ KOHK O EN O?P
VN KU IK	VN KO IK
NUM U OX	NUM VI OX
U+ TAHU U ?PA O?P	U+ TAHU I U ?PA O?P

page 133:

KA I H ?T A	KA HI H ?T A
A IR I	A HIR I
KA UR I	KA HUR I

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Footnotes

[1]Leonard Bloomfield, 'Menomini morphophonemics', TCLP 8.105 (1939).

[2]C. F. Hockett, 'Linguistic elements and their relations', Lg. 37.29-53 (1961).

[3]F. G. Lounsbury, Oneida verb morphology, Yale University Publications in Anthropology 48.13 (New Haven, 1953).

[4]Lounsbury, Oneida verb morphology 48.13.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.0 Introduction to the Morphology

In closing the survey of grammatical categories in the introduction to his Handbook of American Indian Languages, Boas concluded that 'in a discussion of the characteristics of various languages different fundamental categories will be found....'[1] My acceptance of this view carries with it an obligation to follow as closely as possible the overtly marked forms and categories of a language in designing a description of it. In describing the morphology of Chortí, it will be necessary to refer to its scheme of syntactic elements quite frequently in order to explain the functions of the morphological elements. In order to avoid imposing a priori categories either on the language or on the reader, I have deliberately forsaken such familiar labels as noun and verb, transitive and intransitive, and word and phrase, preferring instead abstract labels derived from the forms of Chortí for the more specifically Chortí elements, and general terms with relatively few associations for the rest. I hope that this will help sharpen the focus on the forms and syntactic relations of Chortí.

There are no zero elements in this description. A zero element, since it has no shape, is necessarily an a priori imposition, resulting from an assumption that because some subcategories of a given class are characterized by a certain feature, then all subcategories must be so characterized. I do not assume this. To a statement of the form 'all A's have

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

a B, and B is zero with class A_1', I prefer a statement of the form 'all A's except class A_1 have a B'.

If there is a single most important aspect of Chortí morphology, it is the relation of individual root morphemes to the thematic suffixes via root and base classes, and thereby to the derivational patterns. The thematic systems are the subject of section 6.3 below. Until that section, considerable attention must be paid to the syntactic background of the morphological analysis; after it the focus shifts to the meanings and forms of the individual derivational affixes.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.1 Syntax and Morphology

There is a close relationship between inflectional affixes and clitics on the one hand and the major syntactic categories of Chortí on the other. The stress group, already mentioned as a phonological element, is also of considerable importance in Chortí syntax. While it is convenient to describe derivational and inflectional patterns in relation to these stress groups, the latter are in no sense a 'dividing line' between morphology and syntax. On the contrary, the stress group is the element which shows most clearly the manifold and direct relations between categories which are par excellence 'morphological' and 'syntactic' -- between person and number inflection and construction types, for example.

One example of this is given in the next section, where stress grouping provides an index of the position of construction boundaries. A rather different example is afforded by the alternative positions of the regular plural clitic O?P in these three equivalent sentences, all of which mean 'They learned to count it.'

+. ˈka"nuo?p ˈu'tsi"kio?p +

+. ˈka"no ˈu'tsi"kio?p +

+. ˈka"nuo?p ˈu'tsi"ki +

The two stress groups are coterminous with coordinate constructions, so that plurality of either is equivalent to plurality of both. The first sentence, with two plural markers, is the least fre-

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

quent type. Concord of this kind occurs in the category of aspect, which is a feature of A constructions but not of U constructions. Thus, the first stress groups of the sentences above are perfective, so that the larger coordinate construction is also perfective, though the second stress group, a U construction, is anaspectual. Aspect is discussed more fully below. The point here is that aspect, a feature of a construction type, and plurality, an inflectional category, behave syntactically in just the same way.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.11 Stress Groups and Closure

In addition to defining a stress group, a heavy stress constitutes a morpheme of closure in Chortí. Consider these examples:

+. 'u'?pa?a"xe?eh"matx +

. 'U+ '?PAAX "E 'E 'EH "MATX

his cursing it the raccoon

He curses the raccoon.

+. 'u"?pa?a'xe?eh"matx +

. 'U+ "?PAAX 'E 'EH "MATX

his curse the raccoon

the raccoon's curse

The only audible difference between the two utterances is the position of the first heavy stress. The morphological and syntactic differences between the two constructions are reflected by the stress alone in these particular derivative alternants, although other derivatives of these sequences of basic alternants would differ in more than this feature.

The comparison of simpler constructions with those which have a number of suffixes clearly shows the progressive shift of the heavy stress in more complex constructions:

+. 'u'mu"ki +	He covers it.
+. 'a'muk"ma +	He's a burier.
+. 'a'muk'ma"ian +	He buries
+. 'muk'ma'ia'ne"nik +	Bury it (pl) !

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

The syntactic articulations are marked just as clearly by heavy stress within a pause group:

+, 'ko"ne?er"ka'xa"na + Did he walk today?

+, 'ko"ne?er'ka'xa"na + Today we walk,

These two utterances contrast minimally in phonological and morphophonemic shapes, yet represent quite different constructions. The first contains an interrogative particle KA which is always the second base in constructions where it occurs. The second has the regular KA first person plural prefix and no question particle. The second, with its rising contour, could also be interpreted as a question, 'Are we walking today?' Again the heavy stress closure marker provides the only indication of the syntactic difference, namely, that the KA in the first example is a distinct constituent and not a part of the last constituent, which is coterminous with the last stress group.

There are two morpholexical alternants of the closure marker. One is composed of a single heavy stress, occurring in constructions which end in native Chortí morphemes or in certain borrowed forms. The other is composed of a heavy stress followed by a light stress, occurring only in constructions ending in borrowed forms:

-, 'sut"po?p 'ko"io'te +

, 'SUT 'PA "O?P 'KO"IO'TE

They turned themselves into coyotes.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

+, 'sut"pa'u"ni?i +

, 'SUT "PA 'U+ "NII

It turned itself into his muzzle.

The stress groups defined by the occurrence of a heavy stress coincide, therefore, with some of the constructions of morpheme alternants which are the syntactic constituents of Chortí utterances.

The constructions at the size level to be discussed most fully in this chapter are composed of a single base, with or without one or more inflectional affixes or clitics. Bases in turn are made up of one or more roots with or without one or more derivational affixes. Single base constructions, like all Chortí constructions, belong to either the A or U construction type.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Compound Bases

A base which contains more than one root is a compound base. Both U and A formations which are parallel to the single-root simple bases are attested. A few illustrations are given here, with morpheme glosses for the compounds added in parentheses:

"txan	'mak"txan
Sky.	Rainbow. (Enclose-sky.)
'ah"hu?tx	'ah'katx"xan
Miller.	Thatcher. (One who ties palms.)
"noh	'pok"pok
Big.	Clean. (Wash wash.)
'im"?puts	'im"pu?uk"pu?uk
Good.	Saturated. (Wet wet.)
'txa"men	'txak'pu"ren
Dead.	Red-orange. (Red flame.)
'a'ta"ki	'a'muk'muk'ho"ri
It dries.	He swims. (He cover-covers-head.)

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.12 U and A Construction Types

Chortí constructions are of the U type or the A type. An A construction is aspectual and appositive, whereas a U construction is anaspectual and directive. Constructions of either type are personal if they include a personal affix belonging to the U or A paradigms, or impersonal if they do not.

In U constructions consisting of a director and an axis, the axis is itself a U construction, impersonal in this case:

+. 'u'ka"ni 'e'kor"ma?ar +
his-learning-it the-catching D A
He learns to catch fish.

In the A constructions, the two immediate constituents are coordinate, as in this example:

+. 'a'ka"no 'a'kor"ma
he-learns he-catches C C
He learns to catch fish.

The relation between the two immediate constituents is the same as that in another A construction, this one impersonal, with a marked attributive as the first constituent:

+. 'im"?pu?ts 'e'ui"nik +
good the-man C C
The man is good.

The comparable U construction is directive:

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

+. 'u'?pu"?tsir 'e'ui"nik +

his-goodness the-man D A

the goodness of the man

The normal order of constituents is shown in these U constructions: director-axis. Some examples occur where there is an apposed U construction, called the subject, which precedes the director if an axis follows, and which either precedes or follows it if there is no axis. In a personal A construction, a following U constituent is always the subject. These examples illustrate the possibilities and show the difference in pronominal reference:

+. 'e'ui"nik 'u'io"?pi 'e'i"xik +

The-man his-striking-it the-woman S D A

+. 'e'ui"nik 'u'io"?pi +

The-man 'his-striking-it S D

+. 'u'io"?pi 'e'ui"nik +

His-striking-it the-man D S

Her-striking-it the-man D A

+. 'e'ui"nik 'a'io"?pon +

The-man he-strikes S C

+. 'a'io"?pon 'e'ui"nik

He-strikes the-man C S

In all but the third, which is ambiguous, the man is clearly the agent. The relation between director and subject in the

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

first interpretation of the third of these utterances is a directive relation, similar to but of a higher syntactic level than that between director and axis, as in the pair of utterances discussed above under <u>closure</u>:

'U+ '?PAAX "E 'E 'EH"MATX

his-cursing-it the-raccoon

'U+ "?PAAX 'E 'EH"MATX

his-curse the-raccoon

The first of these is either a director-axis type, 'He curses the raccoon', or a director-subject type, 'The raccoon curses it', depending on the resolution of the ambiguity in context, while the second is unambiguously a director-axis type, 'the raccoon's curse'.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.121 Substantives

Substantives are defined in Chortí as the U construction class which follows the E 'determinative' proclitic. This morpheme, an impersonal and preinitial element, functions very much like the definite article in Spanish, which is its usual translation:

'e'eh"matx	the raccoon
'e'ah"muak	the sick person
'e'nu'kir"te?e	the tall tree
'e'no"xi?i'?ke"txuh	the big sesimite

All these constructions function syntactically as single substantive elements, although the last two incorporate attributive bases, dependent in the third example and apposed in the last.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.122 Attributives

Attributives are those A constructions which do not include a personal affix. That is, an impersonal A construction is an attributive. Like substantives, attributive constructions are sometimes rather complex. Chortí color terms commonly involve reduplicated or other compound attributive bases. A morph-by-morph gloss of these forms, in parentheses, will supplement the freer translations:

'TXAK"TXAK	'TXAK 'PUR "EN
'txak "txak	'txak'pu"ren
(red-red)	(red-fire-attrib.)
red	red-orange

The second base in each of these examples is itself an attributive, and the entire constructions function as attributive elements.

Just as there are personal A formations with root and derived bases, so there are attributive formations based on roots, as in the first formation which follows, and on derived bases, as in the rest. The IN 'attributive' prefix derives A bases from A roots, like ?TSEH 'twisted', and from A bases like ?KI H N and XE H R.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Attributive Formations

(-√)

"?tseh

Twisted.

(-√)

"?kin

Sun.

(U+ -√ E)

'u'xe"re

He divides it.

(U+ -√ A)

'u'tsu"?pa

He stacks it.

(A -√ VI)

'a'txa"mai

He dies.

(IN -√)

'in"?txi?i

Sweet.

(IN -√)

'in"sis

Cold.

(IN -√)

'in"?tseh

Left handed.

(IN -√H)

'iŋ"?kihn

Hot.

(IN -√H)

'in"xehr

Split.

(-√ A N)

'tsu"?pan

Stacked.

(-√ EN)

'txa"men

Dead.

(A -√ R AN)

'a'?txi?i"ran

It becomes sweet.

(A -√ A)

'a'si"sa

It cools.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Numerals and Classifiers

Chortí numeral bases are apposed A constructions. Derived bases composed of a prefix and a classifier are attested from one to five, although the form for five is not in common use, and many Chortí use Spanish loanwords for numerals above three. Most use the classificatory forms from one to four and the originally Spanish root bases above four.

There is a general classifier TEE which is substitutable for, and apparently is replacing, the other more specific classifiers. The attested prefixes are shown with it below:

'VN+"TEE	'in"te?e	One.
'TXAA"TEE	'txa?a"te?e	Two.
'UX"TEE	'ux"te?e	Three.
'TXAN"TEE	'txan"te?e	Four.
'HOO"TEE	'ho?o"te?e	Five.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

In addition to the general classifier, a few forms of more specific reference are attested:

Classifier	Classified
"GOHR	Voluminous objects.
"KOHT	Animate objects.
"PEHT	Sparse objects.
"TAHTX	Breakable objects.
"XER	Divided objects.
"AHR	Repetitions.
"?PII	Days ago.
"?PIH	Days hence.

The first five of these are used, like TEE, immediately before the enumerated U construction:

+. 'txa?a"gohr"tun +

Two stones.

+. 'txa?a"koht'u'max"tak +

He has two boys.

Two alternative readings of the last example are possible: 'Two of his boys', and 'His two boys'.

The last three classifiers normally stand as attributes of larger constructions, without an immediately following enumerated U construction. The last two have morpholexical alternants "II and "IH after the prefixes for 'three' and 'four', while 'four' has an alternant "TXUN before either of these

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

classifiers:

'TXAA"?PII	'TXAA"?PIH
'txa?a"?pi?i	'txa?a"?pih
Two days ago.	Two days from now.
'UX"II	'UX"IH
'u"xi?i	'u"xih
Three days ago.	Three days from now.
'TXUN"II	'TXUN"IH
'txu"ni?i	'txu"nih
Four days ago.	Four days from now.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Classifiers

+. 'iŋ"gohr"?puhr +

One jug.

+. 'iŋ"koht"?tsi?i +

One dog.

+. 'txa?a"peht'u"ieh +

He has two teeth.

+. 'in"tahtx"?txe?eu +

One bowl.

+. 'txa?a"xer"ti?i +

Both lips.

+. 'in"iahr +

Once.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.13 Aspect

Some constructions differ in aspect, being either perfective or imperfective. These features of aspect are not assignable to any immediate constituent of the A constructions where they occur, as these examples demonstrate:

+. "kai +	"KAI	he began
+. 'a"kai +	'A "KAI	he-begins
+. 'a"si +	'AS "I	he-played
+. 'a?a"si +	'A 'AS "I	he-plays
+. 'u'ia"si +	'U+ 'AS "I	his-playing-it
+. "txai +	"TXAI	fish

The first pair has a root base /"kai/, and the next three a thematic base composed of a root AS and thematic suffix I. The last two examples, of U constructions, are neither perfective nor imperfective, but are anaspectual. The second and fourth examples share A prefixes and imperfective aspect, so that these are readily matched. But perfective aspect is not accounted for by this matching. The first, third, and sixth forms do not have prefixes, but the sixth form is not perfective, so that no symmetrical relation obtains between A prefixes and aspect.

Since /"kai/ and /"txai/ are both monomorphemic, the difference in aspect, perfective in the first and absent from the second, is a function of their membership in different syntactic categories, or construction types, of which each is a monomorphemic

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

representative. The first is an A construction, the second a U construction, and both are root bases.

A distinction between imperfective and perfective aspects is therefore a feature of the A construction type. The U construction type is neutral in aspect, that is to say, anaspectual. In these examples the U constituent is the same, and the difference in aspect of the A constructions, reflected by the tense difference of the glosses, is irrelevant in the interpretation of the U constituents.

+. 'ka"nue?en 'in'tsi"ki 'e'tu"min +
'KA'NO "EN 'IN+ 'TSIK "I 'E 'TU"MIN
learn-I my-counting-it the-money
I learned to count money.

+. 'iŋ'ka"no 'in'tsi"ki 'e'tu"min +
'IN 'KAN "O 'IN+ 'TSIK "I 'E 'TU"MIN
I-learn my-counting-it the-money
I'm learning to count money.

That some aspectual constructions are marked while others are not is in part a consequence of my rejection of zero elements. The plural clitic and aspect are two categories where the Chortí data lead to skewed solutions of this kind. Personal inflection brings up another of these in the next section.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.2 Inflection

The outermost layers of a Chortí construction are the inflectional clitics. Three of these occur at the end of bases: the plural, effective, and resumptive morphemes. These are discussed below, in section 6.22. There is one proclitic, the impersonal E determinative, which has already been discussed.

The personal inflectional prefixes and suffixes, discussed in section 6.21 below, occur between clitics and derivational affixes.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.21 Personal Inflection

There are three sets of personal affixes in Chortí. The paradigms of the A and U prefixes are agent markers associated with the A and U construction types respectively.

The personal suffixes occur in U constructions as patient markers and in perfective A constructions as agent markers. There is no third person suffix, so that the material treated below under the headings third person patients and third person agents involves a shift of emphasis back to syntactic patterns. These patterns make it preferable to regard certain bare bases as third person forms, and so require the distinction between personal and impersonal constructions to be specified by listing the impersonal affixes.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.211 The A Prefixes

The basic alternants of the A prefixes are:

	Singular	Plural
First person	VN	KA
Second person	I	IX
Third person	A	

Unlike the first and second person affixes of Chortí, which have distinct plural forms, the third person affixes cooccur with the O?P 'plural' clitic which also occurs in impersonal constructions. Thus, the personal inflection of a representative A construction, on a thematic base NUM VI 'pass' is as follows:

'in'nu"mui	'ka'nu"mui
'i'nu"mui	'ix'nu"mui
'a'nu"mui	'a'nu"muo?p

Besides the particular combination of person and number features of each form, the A prefixes have a common feature of aspectual meaning, namely, the imperfective aspect.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.212 The U Prefixes

Two distinct morpholexical alternations occur in the personal U prefix sets, such that a regular and a hybrid paradigm must be distinguished, each having conditioned alternants of the first person singular.

The U prefixes are agent markers. In constructions with root bases and with certain derived bases, the first person singular of the regular U paradigm is { NI+ } 'my', and that of the hybrid paradigm is { NI } 'my'. In constructions with thematic and most derived bases, the alternants of these paradigms are { VN+ } 'my' and { VN } 'my' respectively. The particular alternant governed by an affix will be specified in the section devoted to that affix.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Regular and Hybrid U Paradigms

There is morpholexical free variation of the basic alternants of first and second person U prefixes. The alternants, morpholexical since a specific list of morphemes is involved, are shown below together with the A paradigm:

Regular U		Hybrid U		A Paradigm	
VN+ ~ NI+	KA+	VN ~ NI	KA	VN	KA
A+	I+	A	I	I	IX
U+		U+		A	

The informant supplied two paradigms of the I/ base of HI?T 'tie', shown here with the H 'potential' derivative, which displays the A inflection:

Regular U		Hybrid U	
'iŋ'gui"?ti	'ka'ui"?ti	'ĩ?ĩn"?ti	'ke?ei"?ti
'a'ui"?ti	'i'ui"?ti	'e?ei"?ti	'i?i"?ti
'u'ui"?ti		'u'ui"?ti	

A Paradigm

'ĩ?ĩh"?ta	'ke?eih"?ta
'i?ih"?ta	'ix'hih"?ta
'e?eih"?ta	

When the sets of forms shown above were elicited, I asked the informant, who had just supplied the hybrid form, to repeat the second person plural. He supplied / 'i'ui"?ti /, the regular U form.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

The hybrid paradigm is obviously analogical in origin. Compare these thematic formations on the root HU?TX 'grind', one a U formation cursive and one an A formation with a U thematic suffix:

U Paradigm		A Paradigm	
'u?un?tx"ru	'ko?oi?tx"ru	'u?un"?txu	'ko?oi"?txu
'o?oi?tx"ru	'iu?u?tx"ru	'iu?u"?txu	'ix'hu"?txu
'u?u?tx"ru		'o?oi"?txu	

Before HU, { + } never has a phonemic shape, so that the derivative alternants of the two paradigms are alike in this 'prevocalic' environment.

Another factor must be considered, however. The hybrid U paradigm retains a final { + } in the third person. This is the only one of the five prefixes in the U paradigm which does not correspond in form to a member of the A paradigm:

	U Form	A Form
{ IN }	First person singular	First person singular
{ KA }	First person plural	First person plural
{ A }	Second person singular	Third person singular
{ I }	Second person plural	Second person singular

The first person markers correspond in both person and number features of meaning, and the others in either person or number. The possibilities for analogical levelling could hardly be more inviting.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.213 Personal Suffixes

There are four personal suffixes:

	Singular	Plural
First person	EN	ON
Second person	ET	OX

These suffixes are functionally equivalent to U constructions. They occur as axes of director U constructions and in apposition to A constructions, as shown below, with comparable U constructions in the same environments:

Director - Axis

+. 'a'uah"?ku 'e'ui"nik +

your-giving-it the-man

You gave it to the man.

+. 'a'uah"?ke?en +

your-giving-it-me

You gave it to me.

+. 'ui'ni"ket +

man-you

You're a man.

This last type, where the U constituent is a root base, is treated here as an ordinary case of the director-axis construction, different from the others in the monomorphemic structure of the director base, but not otherwise.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Coordinate - Subject

+. 'ka"no 'e'ui"nik +

learned the-man

The man learned.

+. 'ka"nue?en +

learned-me

I learned.

Here the personal suffix is in apposition to the A construction, and functions as its subject. A constructions with personal suffixes are perfective in aspect.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Third Person Agents

Perfective A constructions, where the personal suffixes function as apposed agents, are third person forms when there is no first or second person suffix:

+. 'ka"nue?et +	You (sg) learned.
+. 'ka"nuo?ox +	You (pl) learned.
+. 'ka"no +	He learned.
+. 'ka"nuo?p +	They learned.
+. 'ka"no 'e'ui"nik +	The man learned.

The parallelism between the perfective A bases shown above and the director-axis type of U construction just discussed is complete. The first and second persons are marked, while the third person is not.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Third Person Patients

While the agent paradigms have a third person marker, the personal suffixes do not include a third person form. From the translations of certain utterances, it is clear that both a director and a third person axis are involved, however:

+. 'a"?txa?an 'a'ua"ian +

. 'A '?TXA "AN 'A 'UAI "VN

he-lies down he-sleeps

He lies down to sleep.

+. 'u'?txa"?pu 'a'ua"ian

. 'U+ '?TXA "?PU 'A 'UAI "VN

his-laying-it down he-sleeps

She lays him down to sleep.

Both utterances have to do with a mother placing her child on a bed so it will sleep. The suffix ?PU 'translative' has to do with the moving of objects, but it is not a patient marker. Indeed, there is no third person patient marker at all. This fact suggests a reappraisal of such pairs as:

+. 'u'iah"?ke?en +	He gives it to me.
+. 'u'iah"?ku +	He gives it (to him).
+. 'ui'ni"ken +	I'm a man.
+. 'ui"nik +	(He's a) man.

The personal suffixes are axes in both cases. The forms with no personal suffix are both U constructions of the director

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

type. The absence of a third person suffix, then, affects the interpretation of all three categories of base with which the first and second person suffixes occur. Thematic U constructions and derivatives of them, which govern the { VN+ } alternant of the first person U prefixes, have third person axes unless a first or second person suffix follows. This axis is either a U construction with a base, or is unmarked. In just the same way, an athematic or root base U construction has a third person axis in the absence of a personal suffix, and this axis is either another root base U construction, of the type which governs the { NI+ } prefix alternant, or it is unmarked.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Personal Bases

The personal suffixes occur with an element NA in <u>personal bases</u>. These U constructions occur as apposed subjects in a variety of syntactic environments. The basic alternants and phonological shapes are as shown:

'NA "EN	"ne?en	I
'NA "ET	"ne?et	you (sg)
'NA "ON	"no?on	we
'NA "OX	"no?ox	you (pl)

There is complementarity of function and no doubt a historical relationship of these to the primary suffix NA, which has certain third person agentive functions. The personal bases are used in addition to, rather than in place of the personal affixes:

+ "pe'ro"ne?en +. 'ma?a'txiŋ'gui"ra +

"PE'RO 'NA "EN . 'MA 'A"TXI 'VN+ 'IR "A

But I, I didn't see it.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.22 Clitics

Three suffixes occur in both single base and multibase constructions. Because of their freedom of occurrence and reference within multibase constructions, I call them clitics. The morphemes are O?P 'plural', IX 'effective', and TO 'resumptive', which occur singly, in pairs, or all three in that order:

+. 'u'?pa?a'?krio'?pix"to"ia?a +

They became frightened then and there.

Progressive shifting of the closure marker takes place with the clitics as with other affixes, as this example shows. Clitics usually occur at the end of the first stress group of a pause group.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

0?P and IK: Plural

Reference has already been made in section 6.1 to the syntax of plural affixes. There are two morpholexical alternants: IK, which occurs after imperative bases, and 0?P, which occurs elsewhere.

The IK alternant occurs after any of the three alternants of the imperative, V, N, and EN:

Singular	Gloss	Plural
'?ku"xu	Bite it!	'?ku"xi?ik
'?ke"txe	Carry it!	'?ke"txi?ik
'uh"tan	Blow!	'uh'ta"nik
'xa"ne?en	Walk!	'xa'ne?e"nik
'hatx"pe?en	Rise!	'hatx'pe?e"nik
'muk'ma'ia"nen	Bury!	'muk'ma'ia'ne"nik

There is ambiguous reference of the plural clitic in U constructions, either to an agent prefix or to the base, or to both:

Reference to Agent

+. 'u'?txa"?po?p 'u'ma"txit +

They lay down his machete.

+. 'u'io'to"to?p +

Their house.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Reference to Base

+. 'u"ka "txuo?p +

His horns.

+. 'u'io'to"to?p +

His houses.

Reference to Agent and Base

+. 'u'uix'ka?a"ro?p +

Their wives.

+. 'u'io'to"to?p +

Their houses.

This ambiguity, together with the freedom of occurrence of the plural clitic, leads frequently to constituents like this one, whose subject is a legendary serpent:

+, 'u'sa"tio?p 'io"tot +

He destroyed the houses,

This example supports the description of O?P as a clitic morpheme, since it occurs here in the same position relative to pause as the other clitics, but with its feature of meaning affecting the constituent as a whole.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

The position of occurrence of the plural clitic, after personal suffixes, is the same for both alternants:

+. 'u'iah'?ke?e"no?p +

'U+ 'AH?K 'U 'EN "O?P

They give it to me

+. 'ah'?ku'ne"nik +

'AH?K 'U N 'EN "IK

Give it to me!

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Morpholexical Alternations

Forms like / 'a'xa"no?o?p / are common in the texts provided by other informants, but extremely infrequent in those taken from the principal informant, who regularly uses the / 'a'xa"no?p / alternative.

It is likely, though not certain, that the plural suffix conditions morpholexical alternants of preceding suffixes so that those which have a consonant before a vowel before pause end with the consonant before O?P. This pattern of alternation appears to include the subjective, resultative, reflexive, passive, and middle suffixes. It is parallel to conditioned alternations within the derivational system.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

IX: Effective

The IX clitic occurs in aspectual and anaspectual constructions, where it introduces a feature of anterior time, indicating that an action has already taken place, or that a condition already exists:

+, 'e'i"xik 'ia"ha?a +. 'a'sa"ki?ix 'u"hor +

That woman, her head is already white.

+. 'i'e"sa"puix "?txa?ar 'ta'me"bol'sa +

And the toad was already lying in the bag.

-, 'in"te?eix 'txi"nam +. 'sut"pa 'o'ko'te"pe'ke+

It is another town, which became Ocotepeque.

-. '?pah'?ka"tix 'ka'sut"pa 'ko"io'te +

It is feared we would have become coyotes.

The normal position for this clitic is in the first stress group of a pause group, as in the examples above.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

TO: Resumptive

When the narrator of a Chortí text ends the elaboration of detailed description and commentary and returns to the progression of events, the most frequently used device for marking the resumption of action is the final clitic TO. Each of these examples in context is clearly 'resumptive' in meaning. The last shows the order with respect to the other clitics:

+, 'i'kon'dix"to +, "kai +, 'ta"ki'e"ha?a +

And then, when the water had begun to dry up,

+, 'kon'da"ne?en 'max'ta'ken"to +

When I was a youth,

+, 'u'?pa?a'krio?p'ix"to "ia?a +

They became frightened then and there.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.3 Thematic Suffixes and Derivational Systems

The pattern of derivational formations and the morpholexical alternants of the derivational affixes with which a given root occurs are partly determined by the base class to which the root belongs. There are ten thematic suffixes, of which five occur in both A and U constructions, and five in A constructions only. Each of these fifteen combinations, of construction type and thematic suffix, defines a thematic base class. The classes will be distinguished by placing a virgule before the thematic alternant, if an A class, or after, if a U class. The thematic base classes are:

U Type Base Classes

A/ E/ I/ O/ U/

A Type Base Classes

/A /E /I /O /U

/VI /VN /AN /ON /UAN

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Root Classification

Thematic base classes are the foundation for the classification of root morphemes. Some roots, like TXE 'do', TXAI 'fish', KAI 'begin', and ?TSEH 'twisted' do not occur with any thematic suffix, and are called root bases. The first two are U bases, the last two are A bases. Like many roots, IO?P 'strike' belongs to two thematic base classes:

Basic Alternants:	'U+ 'IO?P "I	'A 'IO?P "ON
Phonological Shape:	'u'io"?pi	'a'io"?pon
Translation:	He strikes it.	He strikes.
Base class:	I/	/ON

One root, ?KUX 'bite', is attested in three base classes: I/, /VN, and /UAN. Other roots, as shown in the list of root classes, belong to one or two.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Root Classes

One Base Class

Class	Root	Gloss	Example
A/	?PEHK	call	'u'?peh"ka
E/	?KETX	carry	'u'?ke"txe
I/	?KUTX	bear	'u'?ku"txi
O/	KOHK	watch	'u'koh"ko
U/	AH?K	give	'u'iah"?ku
/A	SIS	cool	'a'si"sa
/E	TSEEN	laugh	'a'tse?e"ne
/I	?KAX	fall	'a'?ka"xi
/O	MES	sweep	'a'me"so
/U	HU?TX	grind	'o?oi"?txu
/VI	TXAM	die	'a'txa"mai
/AN	AU	rise	'a?a"uan
/ON	PAA?TX	fertile	'a'pa?a"?txon
/UAN	?TXU	hang	'a'?txu"uan

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Two Base Classes

Class	Root	Gloss	Examples	
A/ON	IR	see	'u'ui"ra	'e?e"ron
E/O	AAR	tell	'u'ia?a"re	'a?a"ro
E/UAN	?PAAX	curse	'u'?pa?a"xe	'a'?pa?a"xuan
I/I	?KAN	want	'u'?ka"ni	'a'?ka"ni
I/O	MAN	buy	'u'ma"ni	'a'ma"no
I/VN	UAI	lay	'u'ua"ii	'a'ua"ian
I/AN	XUH?TX	steal	'u'xuh"txi	'a'xuh"txan
I/ON	XA?T	tear	'u'xa"?ti	'a'xa"?ton
I/UAN	XA?P	scratch	'u'xa"?pi	'a'xa"?puan

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Meaning and Function of Thematic Suffixes

In those relatively rare cases where thematic bases and root bases are directly comparable, so that a thematic suffix contrasts minimally or subminimally with its own absence, the feature of meaning associated with the thematic affixes is roughly that of action versus condition, in A constructions, or process versus product, in U constructions:

+. 'u"?pa?ax + His curse.

+. 'u'?pa?a"xe + His cursing.

It is their syntactic functions, as distinct from their very general and perhaps illusory feature of meaning, which make the thematic suffixes so important to Chortí derivational and inflectional morphology. Thematic suffixes change the reference or function of personal inflectional affixes, limit the freedom of occurrence of bases with certain derivational morphemes, and govern certain morpholexical alternants of other derivational morphemes.

In A constructions which coordinate with following U constructions, an A prefix is in concord with the U construction, which is the subject. In U constructions which subordinate a following U construction, the axis, the U prefix of the first, or director constituent, is not in concord with the axis. Note therefore the role of the thematic suffixes in utterances like these:

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Coordinate-Subject

+. 'a'io"?pon'e'ui"nik +

The man strikes.

Director-Axis

÷. 'a'io"?pi'e'ui"nik ÷

You strike the man.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.31 Thematic Systems

The thematic suffixes divide into four major groups with respect to occurrence with other derivational affixes and their alternants. The groups are:

(1) the I/ system, of I/ and E/ roots;

(2) other U type base classes;

(3) the /VI system;

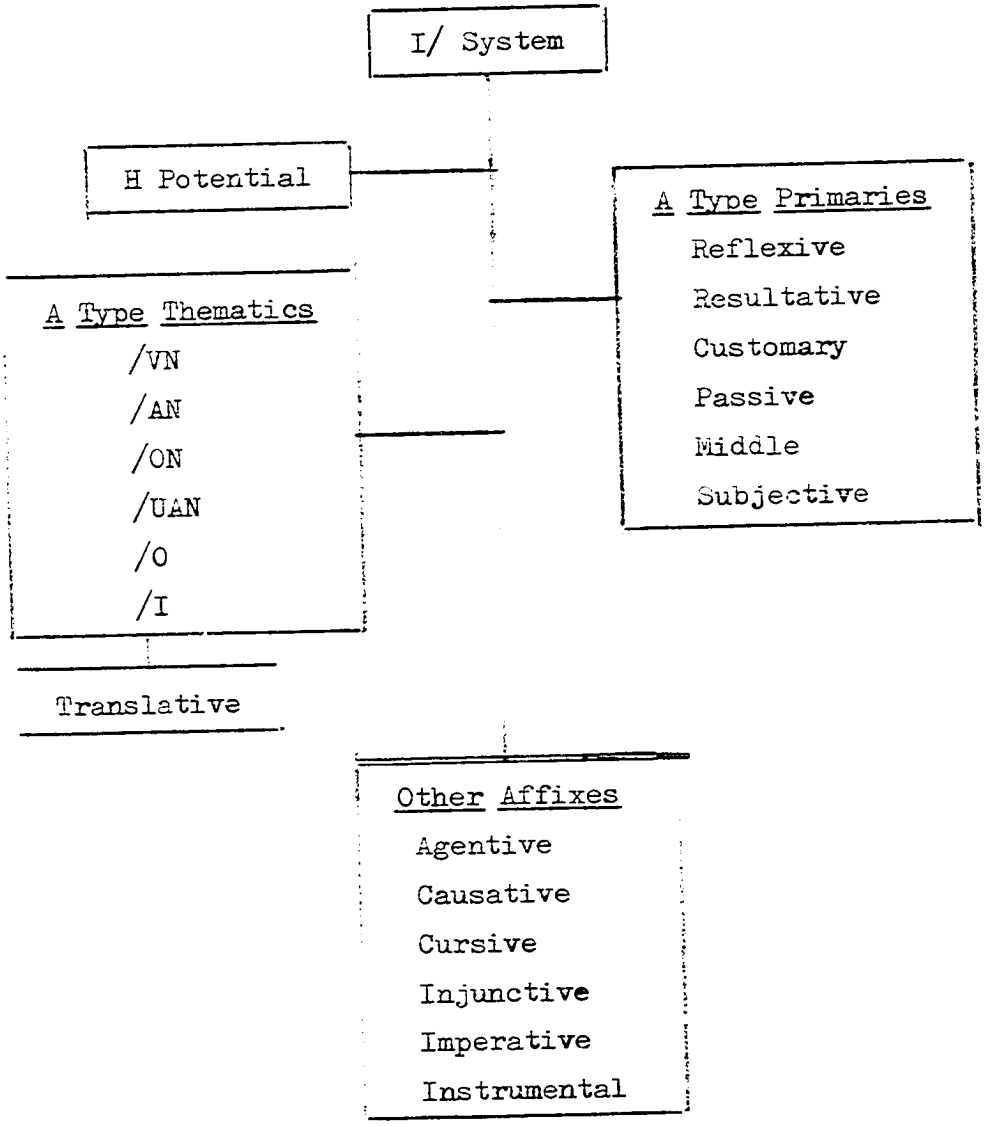
(4) other A type base classes.

The I/ system is the most complex, and also the best attested.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

The I/ System

Because many roots in the I/ and E/ classes also occur with A type thematic suffixes, the I/ system is related through its member roots to those other systems to which they belong. The easiest way to display these relationships is in a chart, but the details must be followed down through the individual suffixes and formations given below. The summary chart:



Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Other U Type Systems

The other U type thematic systems are parallel to the I/ system, but less extensive. They share the N imperative alternant, whereas the I/ system has the V alternant.

The A/ system resembles A type systems in including an attributive formation (see section 6.4). It has an AN alternant of the thematic before the IAH/IAN secondary, and before the ?TSA passive:

'A 'UHT 'AN "?TSA

'o?oh'tan"?tsa

He is blown on.

The U/ system thematic is as widely distributed as the A/ type: it occurs where the O/ and I/ system alternants do not. The subjective suffix shows the distribution of thematics clearly.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

The /VI System

The /VI roots do not have thematic U type formations, although cursives occur. The plain causative, on the other hand, has the SE alternant with thematic bases, unlike the ES alternant found in other A type systems. The EN primary attributive formation is an important feature of this system.

Other A Type Systems

The /UAN system stands out from the others in having its own U primary formation, the translative. Minor differences of conditioning exist among the other A systems, but these are best taken up suffix by suffix and followed through the derivational suffix discussion formation by formation.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.32 Distribution of Thematic Suffixes

Thematic suffixes occur before the factitive suffix, but after some alternants of the cursive suffix. However, in those forms where all three occur, the order is thematic, factitive, and cursive, or I H R in:

'U+ 'TAK 'I H R 'ES "IK

+. 'u'ta'kih're"sik +

Let him rub it dry.

In accounting for the distribution of the derivational affixes, including the thematics, I use a scheme of relative position classes based on radical, primary, and secondary positions, supplemented as shown in the list below:

Position Classes of Affixes

1 Preradical

-√2 Radical

3 Postradical

4 Preprimary

5 Primary

6 Postprimary

7 Presecondary

8 Secondary

9 Postsecondary

The membership of an alternant in one or more position classes is neither criterial nor trivial in assigning it to the

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

same morpheme as an alternant in another position class. The criteria for assigning two elements to an equivalence class, as stated in chapter 0. above, are isomerism and noncontrastive distribution. The feature defining the isomerism of morpheme alternants is always a feature of meaning in this study, never a feature of distribution. Nevertheless, since two alternants are found in different position classes because they occur in different morphological environments, there is often determined variation in their meanings. While this will be observed in the alternants of other derivational affixes, it is not detectable in the thematic suffixes, although they do occur in radical position, before the factitive suffix, and in primary position, after the preprimary alternants of the cursive suffix.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.321 Thematics with Radical Affixes

Thematic suffixes occur with three radical affixes: the preradical AH agentive, the radical infix H potential, and the postradical H factitive.

The preradical agentive is not directly connected with the thematic systems, but occurs with a cursive base which does contain an /I thematic alternant.

The radical infix H potential usually occurs before an /A suffix but in roots of the I/ and E/ classes.

The postradical H factitive follows thematic and radical vowels. It governs a V alternant of the I/ thematic.

In the lists of examples, here and in following sections, the position of the root is indicated by a radical sign within parentheses, as a heading for the examples showing arrangements of the basic alternants arranged around the radical sign.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

AH: Agentive

The preradical AH agentive affix derives U bases from a variety of U and A bases. It governs the IAH and AH alternants of the IAH/IAN secondary suffix, and takes the substantive suffix when it occurs with attributive roots.

With root U bases, the agentive has an allocative feature of meaning not present with derived bases. This difference parallels the change in U prefixes:

Root Bases

Possessor	Allocative
'u'txi"nam	'ah'txi"nam
His town.	Townsman.
Agent	**Agentive**
'u'ta"res	'ah'ta"res
He brings it.	Bringer.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

AH Agentive Formations

(-√)

"muak

Disease.

(AH -√)

'ah"muak

Sick person.

(U+ -√ I)

'u?u"?txi

She grinds it.

(AH -√)

'ah"hu?tx

Grinder.

(-√ ER)

'u"?txer

Drunkenness.

(AH -√ ER)

'o?oi"?txer

Drunkard.

(-√ NA AR)

'pat"na?ar

Working.

(AH -√ NA AR)

'ah'pat"na?ar

Worker.

(-√ PA AR)

:?kam"pa?ar

Using.

(AH -√ PA AR)

'ah'?kam"pa?ar

User.

(-√ I AR)

'nuh"?pia?ar

Mating.

(AH -√ I AR)

'ah'nuh"?pia?ar

Mate.

(U+ -√ ES)

'u'ta"res

He brings it.

(AH -√ ES)

'ah'ta"res

Bringer.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

AH Agentive Formations, cont.

(IN -√)

'in"naht

Distant.

(A -√ S AN)

'a'io?p"san

He strikes.

(A -√ ES IAN)

'a'tah'pes"ian

He extinguishes.

(A -√ MA IAN)

'a'txuk'ma"ian

He is a hunter.

(AH -√ IR)

'ah'nah"tir

Foreigner.

(AH -√ S AH)

'ah'io?p"sah

Striker.

(AH -√ ES IAH)

'ah'tah'pes"iah

Extinguisher.

(AH -√ MA IAH)

'ah'txuk'ma"iah

Hunter.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

H: Potential

The H 'potential' infix occurs with roots of the I/ and E/ classes. The infix precedes a root coda or nuclear satellite, and follows the root nucleus or permuted first person marker, if any:

'u'ma"ni	'a'mah"na
He buys it.	It can be bought.
'u'to"ii	'a'toh"ia
He pays it.	It can be paid.
'iŋ'gui"?ti	'i?iŋh"?ta
I tie it.	I can be tied.

The root and infix occur in four environments: before /A, before the instrumental suffix, after the IN attributive prefix, and after numeral prefixes, in a classifier, as shown in the last example in the formation list below.

In imperfectives, the meaning of H is 'potential':

+, 'e'ui"nik +. 'a'ioh"?pa'u'me'ne"txih +

The man may be kicked by the horse.

+, 'e'ui"nik +. 'a'io?p"?tsa'u'me'ne"txih +

The man is kicked by the horse.

In perfectives, there is no clear sense of potentiality. Both classifier and attributive formation appear to lack any such feature in contrast to other forms with no H infix:

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

'u'xe"re	'in"xehr
He divides it.	Split.
'a'si"sa	'in"sis
It cools.	Cold.

The assignment of meaning, therefore, is based on the imperfective examples.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

H Potential Formations

(U+ -√ E)	(A -√H A)
'u'xe"re	'a'xeh"ra
He divides it.	It is divided.
'u'?ke"txe	'a'?keh"txa
He carries it.	It is carried.
(U+ -√ I)	(A -√H A)
'u'mu"ki	'a'muh"ka
He covers it.	It is covered.
'u'to"ii	'a'toh"ia
He pays it.	It is paid.
(U+ -√ I)	(-√H I ?P)
'u'mu"xi	'muh"xi?p
She grinds it.	Grindstone.
'u'txa"pi	'txah"pi?p
She cooks it.	Cooking pot.
(U+ -√ I)	(VN+ -√H)
'u'go"ri	'iŋ"gohr
She wraps it.	One (bundle).

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

H: Factitive

This suffix usually precedes a causative suffix, so that the gloss assigned to it is perhaps unwarranted. The one example with no causative, / +. 'a'lo'koh"ran + / 'He becomes crazy', is the basis for the assignment of the factitive feature of meaning.

Because all the other alternants of the suffix occur after retained thematic or radical vowels, the segmentation of U+ MOR V H SE was made to parallel them, so that there is only one alternant of the factitive.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

H Factitive Formations

(-√)

"lo'ko

He's crazy.

(-√)

'?ka"?pa

It's a name.

(U+ -√ I)

'u'mo"ri

He collects it.

(A -√ O)

'a'?po"ro

It multiplies.

(A -√ I)

'a'ta"ki

It dries.

(U+ -√ I H SE)

'u'ta'kih"se

He dries it.

(A -√ H R AN)

'a'lo'koh"ran

He becomes crazy.

(U+ -√ H SE)

'u'?ka'?pah"se

He proclaims it.

(U+ -√ V H SE)

'u'mo'roh"se

He causes it to collect.

(U+ -√ O H SE)

'u'?po'roh"se

He increases it.

(U -√ I H SE)

'u'ta'kih"se

He dries it.

(U+ -√ I H R ES IK)

'u'ta'kih're"sik

Let him rub it dry.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.322 Thematics with Primary and Secondary Affixes

All thematics occur before the injunctive; all but I/ and E/ occur before the imperative.

The U/ thematic occurs before the NA subjective and IAH/IAN secondary; the A/ thematic occurs before the ?P instrumental. A type thematics occur with the cursive as follows:

/ON	after alternant R;
/VN, /UAN	before alternant ER;
/A, /I, /O	before alternant AR.

With the instrumental ?P, /A and /I occur; with I?P, the /VN thematic occurs.

Two thematics have conditioned alternants: /VN is N before vowels, and /ON is AN after the causative S alternant.

Thematic suffixes do not occur with other derivational affixes. The primary and secondary affixes are discussed individually in the next two sections, 6.4 and 6.5.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.4 Primary Derivational Affixes

The primary attributive affix has been mentioned above. It has three alternants, as follows:

IN before imperfective A bases;

EN after perfective /VI roots;

N after other perfective A roots.

The formations themselves are listed above in section 6.1. Here, I wish to point out the aspectual parallelisms in these forms:

Root: perfective

"?TSEH	"KAI
+. "?tseh +	+. "kai +
(He's) twisted.	(He) began.

Root with prefix: imperfective

'IN "?TSEH	'A "KAI
+. 'in"?tseh +	+. 'a"kai +
(He's) left handed.	(He) begins.

Root with suffix: perfective

'TXAM "EN	'TXAM "VI
+. 'txa"men +	+. 'txa"mai +
(He's) dead.	(He) died.

The attributive affix, then, is the basis for assigning attributives to the A construction, since it clearly parallels the

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

aspectual distinctions of the thematic A formations, and functions syntactically in a like, but complementary class of environments.

The attributive affix is a primary deriving A formations from A roots, and is unique in belonging to both prefix and suffix position classes.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.41 A Primary Suffixes

There are five primary suffixes which derive A bases from U bases. The reflexive and resultative have alternants P and T before causatives, and PA and TA elsewhere. The other A primary suffixes have one basic alternant each, as follows:

Customary:	MA
Passive:	?TSA
Middle:	?KA

A brief discussion of each is given below.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

PA: Reflexive

A primary suffix PA occurs with I/ system roots. The subject acts upon himself:

'u'mu"ki	'a'muk"pa
he covers it	he submerges
'u'xa"?ti	'a'xa?t"pa
he tears it	it tears apart
'u'?tso"ki	'a'?tsok"pa
he breaks it apart	it parts
'u'ioh"ii	'a'iohi"pa
he bends it	it droops
'u'xe"re	'a'xer"pa
he divides it	it divides.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

TA: Resultative

A primary suffix TA occurs with I/ system roots. Its meaning is not very clear, since only a few examples are attested. These seem to indicate that the action in question has been brought to fruition:

+, 'kon"da'?tsak"ta +, 'e"o'txo"di'ia +

When the eight days had accumulated,

+, "kon'do'txek"ta'e'xu"kur'ia"ha?a +

When that stream appeared,

It is instructive to compare the cursives of these roots with the forms and meanings above:

+. '?tsa"kar +

It is sufficient.

+. 'txe"ker +

It is evident.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

TA Resultative Formations

(U+ √ I)

'u'?tsa"ki

He adds to it.

(A √ TA)

'a'?tsak"ta

It accumulates.

(A √ TA)

'a'txek"ta

It appears.

(U+ √ T ES)

'u'txek"tes

He reveals it.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

MA: Customary

A primary suffix MA occurs with I/ system roots. The subject performs these actions customarily, as his work, for example:

'u'xu"ri	'a'xur"ma
he cuts it	he's a cutter
'u'tsi"ki	'a'tsik"ma
he counts it	he's an accountant
'u'to"ii	'a'toi"ma
he pays it	he's a payer
'u'xe"re	'a'xer"ma
he divides it	he's a sharer
'u'?ke"txe	'a:?ketx"ma
he carries it	he's a porter.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

?TSA: Passive

A primary suffix ?TSA occurs with I/ system roots and is attested once with an A/ root. The meaning of ?TSA is clearly passive.

'u'io"?pi	'a'io?p"?tsa
he strikes it	it is struck
'u'?ku"xi	'a'?kux"?tsa
he bites it	it is bitten
'u'ma"ni	'a'man"?tsa
he buys it	it is bought
'u'to"ni	'a'ton"?tsa
he causes it	it is caused
'u'xe"re	'a'xer"?tsa
he divides it	it is divided
'u'iuh"ta	'o?oh'tan"?tsa
he blows on it	it is blown on

The last example, a secondary base, belongs to the A/ system.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

?KA: Middle

A primary suffix ?KA occurs with roots of the I/ system. The subject acts by or upon himself:

'u'ui"?ti	'a'ui?t"?ka
he shatters it	it bursts
'u'ua"ii	'a'uai"?ka
he lays it flat	he dreams
'u'?pu"?ti	'a'?pu?t"?ka
he fills it	it fills
'u'pu"si	'a'pus"?ka
he drops it	it pours out

There is a special secondary base derived from a factitive causative of the I/ root MOR, with which ?KA is attested:

'u'mo'roh"se	'a'mo'roh'se?en"?ka
he causes a gathering	he causes it to gather itself.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.42 U Primary Suffixes

There are three primary suffixes which derive U bases from A bases. The translative derives them from roots of the /UAN class, the intensive from attributive bases and from U root bases, and the substantive from attributive bases.

The intensive and substantive forms govern the { NI+ } alternant of the first person singular prefix.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

?PU: Translative

The morpholexical alternants of the translative suffix are:

?P after radical A, E, I, before NA 'subjective';

?PU after radical A, E, I elsewhere;

?PA after radical O, U.

Examples of all but radical O appear on the next page:
/ 'u'kot"?pa / 'he places it upside down' is also attested.

It is obvious from the examples that all the uses of this suffix have to do with the placing of objects in certain attitudes. I do not find this feature of meaning similar enough to that of the instrumental suffix to warrant combining the two.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

?PU Translative Formations

(A -√ UAN)

'a'pak"uan

He is face down.

(A -√ UAN)

'a'tur"uan

He is seated.

(U+ -√ ?PU)

'u'?txa"?pu

He lays it down.

(U+ -√ ?PU)

'u'?txi?i"?pu

He opens it up.

(U+ -√ ?PU)

'u'ua"?pu

He stands it up.

(U+ -√ ?PA)

'u'tur"?pa

He seats it.

(U+ -√ ?PU)

'u'pak"?pu

He turns him face down.

(U+ -√ ?PA)

'u'tur"?pa

He seats it.

(-√ ?PU N)

'?txa"?pun

Lay it down!

(-√ ?PU ?P IR)

'?txi?i'?pu"?pir

Opened up.

(A -√ ?P NA)

'a'ua?p"na

He is stood up.

(A -√ ?PA NA)

'a'tur'?pa"na

He is seated.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

VR: Intensive

Although the VR 'intensive' suffix, occurring with root U bases, is in complementary distribution with the VR alternants of the cursive suffix, and therefore with the other alternants as well, nevertheless I find no similarity of meaning to justify assigning these alternants to a single morpheme.

The forms are sparsely attested in the corpus, so that an assignment of these alternants to a morpheme must remain tentative. That there is an 'intensive' feature of meaning associated with these constructions is quite clear, however.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

VR Intensive Formations

(-√)

'ui"nik

Man.

"?pak

Bone.

(IN -√)

'in"sis

Cold.

(-√ VR)

'uiŋ"kir

Master.

'?ke"uer

Hide.

'?pa"kar

Core.

(-√ VR)

'uiŋ"kir

Master.

'?pa"kar

Core.

(-√ VR)

'si"sir

Great coldness.

(U+ -√ R AR)

'u'uiŋ'ki"rar

His master.

'u'?keu"rar

His hide.

'u'?pak"rar

Its core.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Substantive Suffix

The substantive suffix has two alternants, which occur in primary position:

AR after I nuclei;

IR after A, E, O, and U nuclei.

It occurs after A type root bases, and derives substantives:

'IN "SIS	'SIS "AR
'in"sis	'si"sar
cold	coldness
'PUS "PUS	'PUS 'PUS "IR
'pus"pus	'pus'pu"sir
naked	nakedness

These substantives sometimes occur in dependent constructions:

+. 'u'si'sa"rir'e'a"?katx +

The coldness of the (dead) chicken.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.43 Other Primary Affixes

There are two other primary affixes: the cursive, with both preprimary and primary alternants, and the postprimary NA subjective suffix.

The cursive occurs in a variety of constructions; the subjective derives A bases from U bases.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Cursives

Alternants of this suffix share a feature of meaning, called 'cursive' here, whereby an action or state is referred to as in the course of development, or in progress, without reference to beginning or end.

There are six alternants of the cursive suffix, occurring in three position classes. The three preprimary alternants are:

R before /ON and /AN;

VR in other A bases;

RV in U bases.

In addition to the cursive feature of meaning, these alternants share an 'iterative-durative' feature, governed by their position class, which feature is apparent in the translations given below.

Two primary cursive alternants occur:

VR after U roots;

ER after A roots.

These alternants both derive U constructions which govern the { NI+ } alternant of the first person prefix, as does the secondary alternant of the cursive, AR, which derives U bases from A bases. The examples listed below under AR formations show some overlapping of distribution, since both AR and ER occur with /I roots. They do not contrast, however, since they belong to different position classes.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

R Cursive Formations

(A -√ ON)

'a'io"?pon

He strikes.

(-√)

sihk

Nest.

(-√)

"lo'ko

Crazy.

(IN -√)

'iŋ"?kun

Soft.

(A -√ R ON)

'a'io?p"ron

He beats.

(A -√ R AN)

'a'sihk"ran

It becomes a nest.

(A -√ H R AN)

'a'lo'koh"ran

He becomes crazy.

(A -√ R AN)

'a'?kun"lan

It softens.

RV Cursive Formations

(U+ -√ I)

'u'?ku"xi

He bites it.

'u'io"?pi

He strikes it.

(U+ -√ RV)

'u'?kux"ru

He nibbles it.

'u'io?p"ro

He beats it.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

VR Cursive Formations

(U+ √ I)

'u'ma"ki

He encloses it.

(√ VR)

'ma"kar

Enclosed.

(U+ √ E)

'u'?ke"txe

He carries it.

(√ VR)

'?ke"txer

Carrying.

(U+ √ ?PU)

'u'ua"?pu

He stands it up.

(√ VR)

"ua?ar

Standing up.

(√ ?P IR)

'hu?tx"?pir

Abraded.

(√ VR ?P IR)

'hu'?txur"?pir

Ground.

(A √ S AN)

'a'io?p"san

He strikes.

(A √ VR S AN)

'a'io'?por"san

He beats.

(A √ ?TSA)

'a'io?p"?tsa

He is struck.

(A √ VR ?TSA)

'a'io'?por"?tsa

He is beaten.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

ER Cursive Formations

(A -√ I)

'o?oi"?txi

He drinks.

(-√ ER)

'u"?txer

Drinking.

(A -√ VI)

'a'ka"rai

He gets drunk.

(-√ ER)

'ka"rer

Drunkenness.

(A -√ VN)

'a'?ku"xun

He hurts.

(-√ N ER)

'?kux"ner

Hurting.

(A -√ UAN)

'a'?txa"uan

He lies down.

(-√ UAN ER)

'?txa'ua"ner

Lying down.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

AR Cursive Formations

(A -√ I)

'a'nuh"xi

He swims.

(-√ I AR)

'nuh"xia?ar

Swimming.

(A -√ O)

'a'ka"no

He teaches

(-√ O AR)

'ka"nua?ar

Teaching.

(A -√H A)

'a'?kuh"xa

It is bitten.

(-√H A AR)

'?kuh"xa?ar

Being bitten.

(A -√ MA)

'a'tsik"ma

He's an accountant.

(-√ MA AR)

'tsik"ma?ar

Accounting.

(A -√ PA)

'a'kor"pa

It protects itself.

(-√ PA AR)

'kor"pa?ar

Protecting itself.

(A -√ ?TSA)

'a'io?p"?tsa

It is struck.

(-√ ?TSA AR)

'io?p"?tsa?ar

Being struck.

(A -√ NA)

'a'pat"na

He works.

(-√ NA AR)

'pat"na?ar

Working.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

NA: Subjective

The postprimary suffix NA derives A bases from U bases. It stands in the subject position in A constructions, functioning as a substitute for an independent U construction in that environment:

+. 'u'tur"?pa'e'ta"mal +

He sets down the tamale.

+. 'a'tur'?pa"na'e'ta"mal +

He sets down the tamale.

+. 'u'iah"?ko?on'e"txi'txa +

He gives us the chicha.

+. 'ah'?ku"no?on'e"txi'txa +

We were given the chicha.

Although translations normally render the last as 'Chicha was given us', as an interpretation of the NA in both the second and fourth examples this is unsatisfactory.

The morpholexical alternation of the subjective appears to follow the same pattern as that of the primaries PA and TA. There is one clear example of the subjective before a vowel:

'A 'KOR P 'ES "NA	'KOR P 'ES N 'I?P "IR
'a'kor'pes"na	'kor'pes'ni"?pir
He is protected.	Protector.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

NA Subjective Formations

(U+ -√ A)	(A -√ NA)
'u'ui"ra	'e?er"na
He sees it.	He is seen.
(U+ -√ E)	(A -√ NA)
'u'?pa?a"xe	'a'?pa?ax"na
He curses it.	He is cursed.
(U+ -√ I)	(A -√ NA)
'u'?txa"ki	'a'?txak"na
He chops it.	He is chopped.
(U+ -√ O)	(A -√ NA)
'u'koh"ko	'a'kohk"na
He watches it.	He is watched.
(U+ -√ U)	(A -√ U NA)
'u'iah"?ku	'a?ah'?ku"na
He gives it.	He is given it.
(U+ -√ SE)	(A -√ ES NA)
'u'txam"se	'a'txa'mes"na
He kills it.	He is killed.
(U+ -√ ES)	(A -√ ES NA)
'u'iah"nes	'a?ah'nes"na
He makes it run.	He is made to run.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

NA Subjective Formations, cont.

(U+ -√ ?PU)

'u'ua"?pu

He stands it up.

(A -√ ?P NA)

'a'ua?p"na

He is stood up.

(U+ -√ ?PA)

'u'tur"?pa

He sets it down.

(A -√ ?PA NA)

'a'tur'?pa"na

He is set down.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

6.5 Secondary Derivational Affixes

After the primary affixes there occur one presecondary suffix, the causative, five secondary suffixes, the instrumental, dependent, imperative, injunctive, and IAH/IAN secondary, and one postsecondary, the IR postsecondary suffix.

The instrumental and dependent suffixes govern the { NI+ } alternant of the first person prefixes. Of the remaining suffixes in this section, the IAH/IAN sometimes governs this alternant, as specified below; the others never do.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Causatives

The causative suffix has the following morpholexical alternants:

S before the AH/AN secondary;

SE after /VI roots and U bases;

ES elsewhere.

The distribution of the alternants is also complementary with respect to construction types: S in A constructions only, SE in U constructions only, and ES in both U and A constructions.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Causative Formations

(U+ -√ A)

'u'ui"ra

He sees it.

(U+ -√ SE)

'u'uir"se

He shows it.

(U+ -√ I)

'u'io"?pi

He strikes it.

(U+ -√ SE)

'u'io?p"se

He strikes it.

(A -√ A)

'a'tah"pa

It goes out.

(A -√ ES)

'a'tah"pes

He extinguishes.

(A -√ A)

'a'tah"pa

It goes out.

(U+ -√ ES)

'u'tah"pes

He extinguishes it.

(A -√ I)

'o?oh"ri

It falls.

(A -√ ES)

'o?oh"res

He drops.

(A -√ I)

'a?a"ti

He bathes.

(U+ -√ ES)

'u'ia"tes

He bathes it.

(A -√ VI)

'a'txa"mai

He dies.

(U+ -√ SE)

'u'txam"se

He kills it.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Causative Formations, cont.

(A -√ VN)

'a'ua"ian

He sleeps.

(A -√ PA)

'a?atx"pa

He rises.

(A -√ PA)

'e?er"pa

He becomes worse.

(U+ -√ SE)

'u'txam"se

He kills it.

(U+ -√ RV)

'u'io?p"ro

He beats it.

(U+ -√ N ES)

'u'uai"nes

He puts him to sleep.

(A -√ P ES)

'a?atx"pes

He causes himself to rise.

(U+ -√ P ES)

'u'ier"pes

He makes him worse.

(A -√ S AN)

'a'txam"san

He kills.

(A -√ VR S AN)

'a'io'?por"san

He beats.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

?P: Instrumental

There are three basic alternants of the instrumental suffix, distributed as follows:

V?P after I/ roots, not before IR;

I?P in A bases, after consonants;

?P elsewhere.

The A/, U/, /A and I/ thematics and the N alternant of the /VN thematic occur before the instrumental; other thematics do not.

The meaning of the suffix is clearest in the examples where an IR suffix does not follow the instrumental:

'uh"?tsu?p	'uai"ni?p
Incense.	Bed.

When IR follows, the constructions are instrumental substantives which usually, though not always, refer to a person as the instrument.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

?P Instrumental Formations

(U+ -√ A)

'u'iuh"ta

He blows on it.

(-√ A ?P IR)

'uh'ta"?pir

Blown on.

(U+ -√ E)

'u'?ke"txe

He carries it.

(-√ ?P IR)

'?ketx"?pir

Carried.

(U+ -√ I)

'u'?ku"xi

He bites it.

(-√ ?P IR)

'?kux"?pir

Bitten.

(U+ -√ O)

'u'koh"ko

He watches it.

(-√ ?P IR)

'kohk"?pir

Watched.

(U+ -√ U)

'u'iah"?ku

He gives it.

(-√ U ?P IR)

'ah'?ku"?pir

Given.

(U+ -√ I)

'u'iuh"?tsi

He smells it.

(-√ V?P)

'uh"?tsu?p

Incense.

(A -√H A)

'a'muh"xa

It is milled.

(-√H I?P)

'muh"xi?p

Metate (millstone).

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

?P Instrumental Formations, cont.

(A -√ A)

'a'xa"na

He walks.

(A -√ I)

'a'?ka"xi

It falls.

(A -√ VN)

'a'ua"ian

He sleeps.

(U+ -√ ?PU)

'u'?txa"?pu

He lays it down.

(A -√ PA)

'a'kor"pa

He protects himself.

(A -√ P ES NA)

'a'kor'pes"na

He is protected.

(U+ -√ SE)

'ɹ'txam"se

He kills it.

(-√ A ?P)

'xa"na?p

Sandals.

(-√ I ?P)

'?ka"xi?p

(Water) fall.

(-√ N I?P)

'uai"ni?p

Bed.

(-√ ?PU ?P IR)

'?txa'?pu"?pir

Laid down.

(-√ P I?P IR)

'kor'pi"?pir

Protection.

(-√ P ES N I?P IR)

'kor'pes'ni"?pir

Prctector.

(-√ ES ?P IR)

'txa'mes"?pir

Killed.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

?P Instrumental Formations, cont.

(U+ -√ ES)

'u'ta"res

He brings it.

(U+ -√ RV)

'u?u?tx"ru

He rubs it.

(-√ ES ?P IR)

'ta'res"?pir

Brought.

(-√ VR ?P IR)

'hu'?txur"?pir

Rubbed.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Dependent Suffix

There are three alternants of the dependent suffix, distributed as follows:

AR after I nuclei;

ER after A and E nuclei;

IR after U and O nuclei.

The dependent suffix occurs in secondary position in dependent substantives in the dependent subtype of the U construction:

Personal prefix	Dependent Base	Axis
'U+	'TUN 'IR "IOK	'NI+ 'UINK 'IR 'AR "ET
(His-	stone-dep. foot)	(My-man-intens.-dep.-you)
	Ankle bone.	You're my master.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Imperatives

There are three alternants of the imperative suffix:

V after I/ and E/ roots;

N after other U bases;

EN after A bases.

The imperative conditions the IK alternant of the plural clitic, which follows the imperative and the personal suffix, if any:

AH?K U N EN IK

'ah'?ku'nè"nik

Give it to me (pl)!

The examples show that the imperative is a final derivational suffix, immediately preceding the inflections and clitics.

The imperative contrasts with the injunctive as follows:

+. 'io?o"pe?en +

Come!

+. 'io?o"pak +

Let him come!

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Imperative Formations

(U+ -√ A)	(-√ A N)
'u'ui"ra	'i"ran
He sees it.	See it!
(U+ -√ E)	(-√ V)
'u'?ke"txe	'?ke"txe
He carries it.	Carry it!
(U+ -√ I)	(-√ V)
'u'xa"?ti	'xa"?ta
He tears it.	Tear it!
'u'ui"?ti	'ui"?ti
He ties it.	Tie it!
'u'txo"ni	'txo"no
He sells it.	Sell it!
'u'?ku"xi	'?ku"xu
He bites it.	Bite it!
(U+ -√ O)	(-√ O N)
'u'xoh"xo	'xoh"xon
He pokes it.	Poke it!
(U+ -√ U)	(-√ U N)
'u'?pih"nu	'?pih"nun
He thinks it.	Think it!

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Imperative Formations, cont.

(A -√ A)

'a'xa"na

He walks.

(-√ A EN)

'xa"ne?en

Walk!

(A -√ O)

'a'?pah"no

He digs.

(-√ O EN)

'?pah"nuen

Dig!

(A -√ VI)

'a'?ta?a"?pai

He climbs.

(-√ EN)

'?ta?a"?pen

Climb!

(A -√ VN)

'a'ua"ian

He sleeps.

(-√ N EN)

'uai"nen

Sleep!

(U+ -√ ?PU)

'u'?txa"?pu

He lays it down.

(-√ ?PU N)

'?txa"?pun

Lay it down!

(A -√ MA)

'a'xa?t"ma

He's a tearer.

(-√ MA EN)

'xa?t"me?en

Be a tearer!

(A -√ PA)

'a?atx"pa

It rises.

(-√ PA EN)

'hatx"pe?en

Rise!

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Imperative Formations, cont.

(A -√ MA IAN)

'a'muk'ma"ian

He's a grave-digger.

(-√ MA IAN EN)

'muk'ma'ia"nen

Be a grave-digger!

(U+ -√ SE)

'u'?ta?a?p"se

He makes it climb.

(-√ SE N)

"?ta?a?p"sen

Make it climb!

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

IK: Injunctive

There are two morpholexical alternants of the injunctive secondary suffix:

K in A bases after vowels,

IK elsewhere.

These examples illustrate the injunctive, showing its reference to later, usually future events. Note, however, that both forms are perfective:

+. 'im'?pin"nu'ke"mix'io?o"pak +

I think that he won't come.

+. 'io?o"pak +

Let him come!

In U constructions, the injunctive cooccurs with the personal prefixes, as shown below.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

IK Injunctive Formations

(U+ -√ A)

'u'?tsa"ka

He cures it.

(U+ -√ A IK)

'u'?tsa"ki?ik

Let him cure it.

(U+ -√ E)

'u'xe"re

He divides it.

(U+ -√ E IK)

'u'xe"ri?ik

Let him divide it.

(U+ -√ I)

'u'?ka"si

He breaks it.

(U+ -√ I IK)

'u'?ka"si?ik

Let him break it.

(A -√ A)

'a'io?o"pa

He comes.

(-√ A K)

'io?o"pak

Let him come.

(A -√ VN)

'a'?ku"xun

He hurts.

(-√ VN IK)

'?ku'xu"nik

Let him hurt.

(A -√ PA)

'a'xa?t"pa

It tears itself.

(-√ PA K)

'xa?t"pak

Let it tear itself.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

IAH/IAN Secondary Suffix

Two alternants of this suffix occur in U constructions and two in A constructions, in secondary position after roots, thematic and primary suffixes, and the causative suffix. The IAH and AH alternants govern the { NI+ } possessive first person prefix, and occur after the E proclitic:

+. 'e'txa'mes"iah'ko"ne'ho +

The killing of rabbits.

+. 'ni'io?p'sa"hir +

My breaking things.

The IAN alternant derives thematic and causative A formations from U bases, as in the examples, and also derives A bases from MA 'customary' bases. The function of the suffix appears to be such a shifting of syntactic category. The AN alternant, unlike IAN, derives A formations from A formations. It is in effect a secondary thematic suffix. The relationships of the forms are as follows: IAH/IAN derives A causatives from U causatives, while AH/AN derives A causatives (and cursives) from A thematics, as the examples show. Examples of IAH and IAN follow; for examples of AH and AN alternants, see the examples of the R cursive and S causative alternants.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

IAH Formations

(U+ √)

'u"txe

He makes it.

(√ IAH)

'txe"iah

Making.

(U+ √ U)

'u'iah"?ku

He gives it.

(√ U IAH)

'ah'?ku"iah

Giving.

(A √ MA)

'a'xer"ma

He's a sharer.

(√ MA IAH)

'xer'ma"iah

Sharing.

(A √ MA)

'a'txuk"ma

He's a hunter.

(AH √ MA IAH)

'ah'txuk'ma"iah

Hunter.

(U+ √ SE)

'u'kan"se

He teaches it.

(√ SE IAH)

'kan'se"iah

Teaching.

(U+ √ SE)

'u'txam"se

He kills it.

(√ ES IAH)

'txa'mes"iah

Killing.

(U+ √ V H SE)

'u'mo'roh"se

He causes it to gather.

(√ V H SE IAH)

'mo'roh'se"iah

Gathering.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

IAN Formations

(U+ √ A)

'u'na?a"ta

He knows it.

(A √ AN IAN)

'a'na?a'tan"ian

He knows.

(U+ √ SE)

'u'kan"se

He teaches it.

(A √ SE IAN)

'a'kan'se"ian

He teaches.

(A √ MA)

'a'txuk"ma

He's a hunter.

(A √ MA IAN)

'a'txuk'ma"ian

He's a hunter.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

IR Postsecondary Suffix

The IR suffix which occurs after the instrumental can not at present be assigned to any of the other suffixes with similar morphophonemic shapes among their alternants. Not only is IR in complementary distribution with all of them, but it has no detectable feature of meaning upon which to base an assignment to any of them, and does not alternate as they do. Indeed, this suffix would not have been segmented at all were it not for this form:

'XAN ?P "AR

'xam"?par

(walk-instrumental)

journey

This is the only /A root attested with the instrumental. All other roots which occur with the instrumental are followed by the IR alternant of this suffix, which therefore has been left as a separate cranberry morpheme, without effect upon the construction class where it occurs.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Footnote

[1]Franz Boas, ed., Handbook of American Indian Languages, Bureau of American ethnology Bulletin 40 Part I 39 (Washington, 1911).

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

7. A Brief Text

An extract from 'The man and the serpent', a text given by Isidro González, is transcribed below in morphophonemic notation, showing the basic alternants, and in phonemic notation. A translation and comments on a few of the features of the text are supplied with it. Some pause groups are numbered. A few comments, keyed to these numbered pause groups of the text, are placed after it.

The text is an unusually slow passage, with relatively little vowel alternation.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

. 'A"IAN 'VN+ 'TEE "DI'IA [1] 'TXE 'KEE 'VN+ 'TEE [2] . 'UI"NIK [3]

+. 'a"ian'in'te?e"di'ia + 'txe'ke?e'in'te?e -. 'ui"nik

There was one day, he said, a man.

, "UAR 'A 'XAN "A 'TA'MA 'U+ "TII 'E "HAA [4] . 'I 'E "HAA "MEI'GRA [5]

+, "ua'ra'xa"na'ta'mu?u"ti?i'e"ha?a +. 'ie?e"ha?a"mei'gra

He was walking along the bank of the stream, and there was much water,

. 'POR "KEE 'TA'MA 'E '?KAX "HAA "?KIN [6] . "MEI'GRA 'E "HAA

+. 'por"ke?e'ta'me?e'?kax"ha?a"?kin +. "mei'gra'e"ha?a +

because during the rainy season, there is much water.

, "KON'DA '?KO?T "VI 'TA'MA 'U+ "TII 'E "HAA [7], 'U+ 'IR "A

+, "kon'da'?ko"?toi'ta'ma'u"ti?i'e"ha?a +, 'u'ui"ra

When he arrived at the bank of the stream, he saw,

'?KAT "VR 'E "TXAN [8] . 'TA'MA 'U+ "HOR 'VN+ 'GO H R "PE'NIA [9]

'?ka"tar'e"txan +. 'ta'ma'u"hor'iŋ'gohr"pe'nia

lying, the snake, on the top of a rock.

."UAR 'A 'UAI "VN 'E "TXAN , 'I 'HAAX "IR [10] , 'KO'TXA 'U+ 'NAAT 'A "IX

+. "uar'a'ua"ian'e"txan +, 'i'ha?a"xir +, 'ko'txa'u'na?a"ti?ix

The snake was sleeping. And he, having realized

'KEE 'E "TXAN . 'A"IAN 'U+ 'TU"MIN 'U+ '?KETX "E 'A 'XAN "A [11]

'ke?e"txan +. 'a"ian'u'tu"min'u'?ke"txa?a'xa"na

that the snake had its money which it carries around,

, 'EN"TON'SES [12] , 'IX "VN "E "TXE . "TXE [13] . 'E "TXAN 'IR "A

+, 'en"ton'ses +, 'i"xin + "e?e - "txe?e - . "txe +. 'e"txan'i"ra

then went...uh...said...He said: 'this snake here

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

'?KAN "I 'U+ 'AH?K 'U "EN 'U+ 'TU"MIN 'KO"NEER [14] . 'POR "E'SO

'?ka"nu'iah"?ke?en'u'tu"min'ko"ne?er +. 'po"re'so

is about to give me its money today. That is why

'?TXA "VR "UAR 'A 'UAI "VN 'TAR "A

"?txa?ar"uar'a'ua"ian'ta"ra +

it is lying sleeping here.'

. 'IX "VN '?KO?T "VI 'TA'MA 'U+ "TII 'E "HAA . 'IX"VN

+. 'i'xin'?ko"?toi'ta'ma'u"ti?i'e"ha?a +. 'i"xin

He went, and arrived at the bank of the stream. He went

'UA "UAN 'TA 'U+ "HOR 'E "TUN

'ua"uan"to?or'e"tun +

and stood on top of the rock.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

Commentary

1. 'A"IAN is a root base, apparently a U type particle. It is anaspectual, although the translation begins with a past tense because of earlier context. The { VN+ } 'one' form begins a new stress group, and so is unassimilated to the preceding nucleus in this and the next occurrence, in group 2. Later examples, as it happens, are of suffixes, and are assimilated.

2. 'TXE is an important root base, meaning 'do' or 'say' as a U construction, or as here, an A construction. Here it means 'he said', referring not to anyone mentioned in the narrative, but to the person who told the story to the informant.

3. The dash marks a hesitation before the delayed 'UI"NIK, which has a falling intonation contour. Without a hesitation, the contour would normally rise here.

4. "UAR is the usual 'progressive' marker, indicating that the action is in progress at the time of reference. The preposition 'TA"MA is translated 'with', 'at', or 'by'; it means 'near to'. 'Bank' is a metaphorical meaning of "TII, which usually means 'lip'.

5. "MEI'GRA is the only Chortí form which has penult heavy stress and is apparently not a recent loan. It may be a composite, but I have no grounds for segmenting it at present.

6. The translation 'during the rainy season' is rather free. The pause group ends in a three-root compound construction of two stress groups, glossed 'fall-water day' and introduced

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

by the 'TA"MA preposition of proximity.

7. Note the aspect of this pause group, perfective because of the perfective A base '?KO?T "VI, and its relation to the context: the time value is not anterior to the past time of the preceding context. Rather, this construction merely specifies that the man's arrival at the stream took place before the sighting of the snake, mentioned next. Clearly, what is involved is an aspect and not a tense system.

8. '?KAT "VR is a cursive. Although "TXAN is the general term for snakes, the one in question is an enormous legendary reptile with horns and a forked tail, in each branch of which it carries a great deal of money.

9. "PE'NIA is used here to refer to the same rock called "TUN 'stone' below. The Spanish loan apparently denotes any stone too large to move, the Chortí form, any stone at all.

10. 'HAAX "IR 'he' has the substantive suffix, and refers to the man, not to the snake. This form is more frequent than "HAAX before pause.

11. This pause group is a good example of a frequent Chortí construction. A closer gloss would be there-is his-money his-carrying-it he-walks , where each hyphenated group of words corresponds to a stress group in the text.

12. 'EN"TON'SES is coordinated with the 'KO'TXA above, just after group 10. It has a resumptive function, similar to that of the resumptive TO clitic.

13. Again, hesitation is followed by a falling intonation,

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

but here the fall is normal, and introduces the quotation of the man, which follows immediately.

14. It appears that 'IR "A 'this' is used only for objects within view, suggesting that the IR is the root 'see'. The status of the A here has not been resolved: it is apparently the same element found in the 'TAR "A 'here' at the end of the next pause group. The root ?KAN 'with for, want' is idiomatically used with following J constructions, indicating futurity.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.