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TUAMOTUAN PHONOLOGY

A THESIS SUBMITTED TO THE GRADUATE DIVISION OF THE
UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

IN LINGUISTICS

JUNE 1969

By

Hiroshi Kuki

Thesis Committee:

Bruce G. Biggs, Chairman
George W. Grace
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We certify that we have read this thesis and that in our opinion it is satisfactory in scope and quality as a thesis for the degree of Master of Arts in Linguistics.

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PREFACE

This study is based upon a corpus of recorded tapes and a subsequent analysis of them during linguistic fieldwork in Papeete, Tahiti, French Polynesia in June-August 1967 with the supervision of Dr. Bruce Biggs under the Polynesian Pre-History Program of the Bernice P. Bishop Museum, Honolulu, Hawaii, and also on further study in Laie and Honolulu, Oahu, Hawaii, in 1967-68.

It was my original intention to use ten to twenty pages for phonology and devote the rest of my thesis to the discussions of Tuamotuan morphology-syntax. (v. Biggs (1959, 1960, 1961 and 1966)). While I was vaguely aware of the fact that fewer phonemes would mean more allophones and other unexpected problems in the area of phonology, I was not really prepared to encounter all the problems discussed in this thesis in detail.

When I began to write earlier chapters on phonology for the first draft of this thesis, I began to notice several serious problems which I thought I had solved in Tahiti, but which had not been really solved. It was my good fortune to find several excellent informants for Tuamotuan on the island of Oahu after my return to Hawaii in fall of 1967.

The analysis of phonology presented here is based primarily upon the speech of three informants: Mr. Robert Palmer (a half New Zealander informant from the atoll of Takatoa), Mr. Tekeheu Munanui (a half Chinese informant from the atoll of Hao) and Miss Marguerite White (a half European informant from the atoll of Hikueru).

My most sincere thanks are naturally first due to these three most patient individuals, for good informants are not too easy to locate in French Polynesia. My thanks are also due to the wives of Robert and Tekeheu who most kindly agreed to put up with lonely hours (sometimes even apart from their husbands) during my informant sessions, especially to Henriette, wife of Tekeheu who married Tekeheu only at the beginning of this past summer in Hawaii. It was truly my good fortune, moreover, that instead of marrying a Tuamotuan girl, Tekeheu married a native speaker of Tahitian, because we could always clarify any issues which involved both Tuamotuan and Tahitian. Henriette was always prudent enough to speak up only when we wanted her to answer our questions on Tahitian.

I also owe thanks to several institutions and to many individuals of several different nationalities whose cooperation and help have been invaluable: to many other native speakers of Tuamotuan in Tahiti who supplied me with the raw material in contemporary spoken Tuamotuan for this work, as well as for at

least a few other forthcoming works; in particular to Miss Lydia Mapuhi (Takaroa), Miss Viki Mapuhi (Takaroa), Mr. Huri Maire (Takaroa), Mr. Teaitu Mariteragi (Hikueru), Mr. Hiro Marigeragi (Takaroa), Mr. Taapai Mataoa (Manihi) and Mrs. Heia Mapuhi (Takaroa);

to a few other informants in Laie and in Honolulu, both on Oahu, Hawaii, in particular to Mrs. Patrick K. Sylva (or Roiti Tahauri from the atoll of Takaroa) and Mr. Terii Rua (from Takaroa) and their parents, all of them now residents of Honolulu;

to Bernice P. Bishop Museum of Honolulu for having made my first fieldwork financially possible; to the Japan Society in New York City for having honored me with a grant-in-aid to have my thesis professionally typed; to La Mission Mormon (especially to President Richards) and La Mission Sanito (especially to Mr. and Mrs. Frank W. Kelley) both in Papeete, Tahiti, and to the Church College of Hawaii, Laie, Oahu (especially to Dr. Wayne Allison) for having put me in touch with most of my informants; to several teachers at Lycée Paul Gauguin in Tahiti who helped me with my housing and transportation problems in Tahiti (especially to Mr. Jean-Louis Vexlard of Greek and Latin, Mr. Philippe Lenoir of English, Mr. Jacques Berg of history, André Senoux of Fine Arts and in particular

to Yves Lemaître of Mathematics who originally put me in touch with all the other teachers mentioned here): to Mr. Jean Gasmann, Administrator of the Tuamotuan Archipelago, Mr. and Mrs. William Brooks of Stanford University, Mr. Paul Ottino of ORSTOM in Papeete, Tahiti and of Bishop Museum, Mr. Serge Arnoux, teacher of English on the atoll of Rangiroa (or Ra'iroa), Dr. Bengt Danielsson of Sweden, and Bishop Mazé of La Mission Catholique in Papeete, for informing me of Tuamotuans in Tahiti and in the Tuamotuan Archipelago, and for other assistance, in particular to Dr. Bengt Danielsson for having let me borrow his own precious microfilm of the original Stimson cards;

to Mr. Jim Evans and Miss Annette Fukuda of the Language Lab of the University of Hawaii for having obtained tapes for me; to my typists Miss Pat E. Keene and Mrs. Marianne Sheikholeslami, who typed up the earlier and the semi-final versions of my thesis; to my Korean colleagues and fellow graduate students, Mr. Chong On Ha, Mrs. Woo Kyuung Lee Park and Miss Kyungja Park, for having listened to the difficult allophones of my Tuamotuan /p,t,k/ together with me.

I also feel a particular debt to Mr. George Trebour, my fellow graduate student in linguistics who not only checked my English throughout this thesis for months, but

also later had to hear out my verbal description of different aspects of the structure of Tuamotuan before I put them in writing. I will never forget several fruitful bull sessions that I had with George, usually around midnight this past summer.

The semi-final copy was proofread by my longtime friend, Mr. Arthur Crisfield who has been my fellow graduate student in linguistics since 1965.

I am particularly grateful to Tokyo College Women's Association, U.S. Embassy, Tokyo, which honored me with a travel grant between Yokohama and Honolulu in 1965 and in particular to the Department of Asian and Pacific Languages of the University of Hawaii (especially to Dr. John Young) who made it possible for me to study American Linguistics and to write this thesis while teaching Japanese here at the University of Hawaii between 1965 and 1968, although it was not always an easy job to teach a language and conduct one's graduate work at the same time.

Special thanks should also be expressed to Brother Daniel of La Mission Mormon in Tahiti for having put me in touch with so many speakers of Tuamotuan in Tahiti, and having run around in Tahiti together with me, visiting native speakers of Tuamotuan one after another, with a tape recorder in hand, and for having helped me transcribe over one thousand sentences of natural speech, which is

occasionally even difficult for native speakers of Tuamotuan to do, due to their high speed.

Although its result was not exhaustively incorporated and only a brief mention of it was made in connection with stress in this thesis, I could make my study of dropped and contracted minor morphemes (or grammatical words), thanks to Brother Daniel's special ability to give me what Tahitians call Parau Vitiviti, or fast speech, first as it was and then with all the dropped and contracted minor morphemes fully supplied, which constitutes one of the most striking features of Tuamotuan morphophonemics.

"There are two branches of science in this world, about which any layman never fails to have an opinion or two, and which have constantly been spoiled by these lay opinions. These sciences are medicine and linguistics,..." once wrote Professor Hitoshi Miyata of Waseda University, my thesis professor for my B.A. degree.

From this viewpoint it may be stated that no other area could be more difficult for a linguist to work on than Polynesia in that any native speaker of any Polynesian language seems to be a would-be linquist, especially in Tahiti where all five Polynesian languages spoken in the entire area of French Polynesia may be heard. Working on Tuamotuan, especially, has somewhat been similar to being involved with a quack doctor. Rapid Tahitianization of contemporary Tuamotuan has been one of the central

difficulties in grasping a clear picture of contemporary spoken Tuamotuan. At first, I even occasionally questioned whether there was still a language today which might be called Tuamotuan and which could be distinguished from Tahitian. My conclusion at this point is that it will still take a minimum of a few decades for the Tuamotuan language to disappear from the face of the earth completely.

Hiroshi Kuki

Honolulu, Hawaii
October 1968

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CHAPTER I

DESCRIPTIVE FRAMEWORK

This thesis deals with the phonology of Tuamotuan. The descriptive framework used here is that of Dr. Biggs as presented in Biggs (1961). Carrol (1965), Newbrand (1951), and Trager-Smith (1957) have also been consulted occasionally.

Three styles of speech are distinguished in this thesis, namely slow deliberate speech, fast deliberate speech and natural speech. Robert Palmer, for example, patiently gave me hundreds of basic words and sentences using the words in the so-called citation form, repeating any word and any sentence three times each. The type of speech of an informant session is defined as deliberate speech. Two different subtypes of deliberate speech were further distinguished. Occasionally, certain ways of articulation were observed only during our informant sessions. An example is /=túga+ áne=/ (v. § .6.3.3.1 and § 6.3.3.2) for 'the male of two siblings.' This type of slower deliberate speech, which reveals several crucial points of Tuamotuan phonology most clearly, is designated as slow(er) deliberate speech. Deliberate speech occasionally approached natural speech, especially after several repetitions of a given word or a sentence. In other words, ways of articulation at times approached or became identical with those of natural speech.

The latter type of deliberate speech is referred to as fast(er) deliberate speech in this thesis. Natural speech is the type of speech often referred to as fast speech by other linguists. It is better referred to as natural speech, at least to my mind, because it sounds fast only to a non-native speaker. If a language a linguist has worked on for a year or two still sounds fast to him after the informant period, his work may not be too reliable.

Every effort has been made to try to cover all of these different styles of Tuamotuan speech. Although morphophonemics (to be published later) will cover natural speech, analysis of phonology as presented here is principally based upon deliberate speech. My stress theory, which is one of the major topics of this thesis, is primarily based upon slower deliberate speech. Stress patterns in faster deliberate and natural speech are discussed later.

Tuamotuan phonology as presented here is a prelude to projected work on Tuamotuan morphology-syntax which will also include the morphophonemics of Tuamotuan. The relevance of this brief outline of the grammatical framework, although grammar is not in fact discussed in this thesis, lies in the critical importance of the junctural phenomena to the grammatical subdivisions of sentences. A considerable degree of work has also already been done on Tuamotuan morphology-syntax in Tahiti in the summer of 1967, and in Laie, Oahu, Hawaii from the fall of 1967, through the summer of 1968.

The latter work is to be compiled with the phonology presented here in a future form of the entire work. For these reasons, it seems appropriate to present an outline of the next work to be written, also, here at the beginning of the thesis.

The descriptive framework used for my study of Tuamotuan morphology-syntax is also that of Dr. Biggs as presented in Biggs (1957, 1960, 1961, and 1966). Pawley (1961) and Carroll (1965) use the same descriptive model for their descriptions of Samoan and Nukuoro, respectively. Both of them, especially the latter, have been used as guidelines for my study of Tuamotuan morphology-syntax. Other descriptive models such as Buse (1960, 1963a,b, and c, 1965 and 1966) and a generative model as applied to a Polynesian language, such as Hohepa (1966), are also available, but they have not been followed in my study.

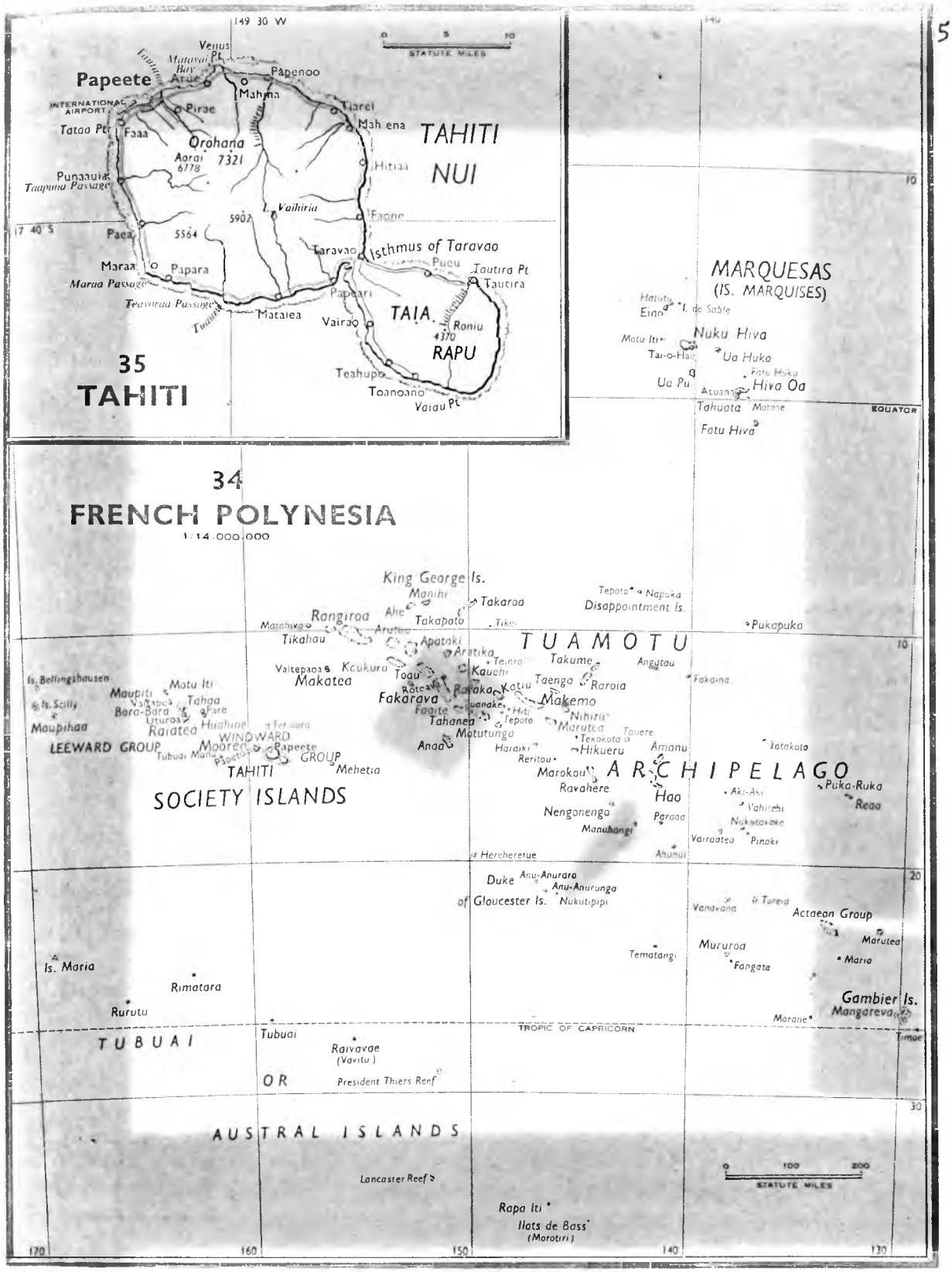
As is well known among Polynesian linguists today, the descriptive framework under discussion is based upon a high degree of correlation between a phonological phrase and a grammatical phrase.

A phonological phrase is bordered by final and non-final junctures, and is characterized by the presence of phrase stress /ˇ/ which occurs once in every phrase. Tuamotuan utterances are thus divided into shorter stretches of phonological phrases and further into syllables and phones.

A grammatical phrase, which coincides in a high proportion of cases with a phonological phrase, is divided into peripheries, preposed and postposed, and a nucleus. All functional or relational words, which are designated minor morphemes (traditionally called particles in the descriptions of other Polynesian languages), occur in the peripheries. All content words, which are called major morphemes, occur in the nucleus.

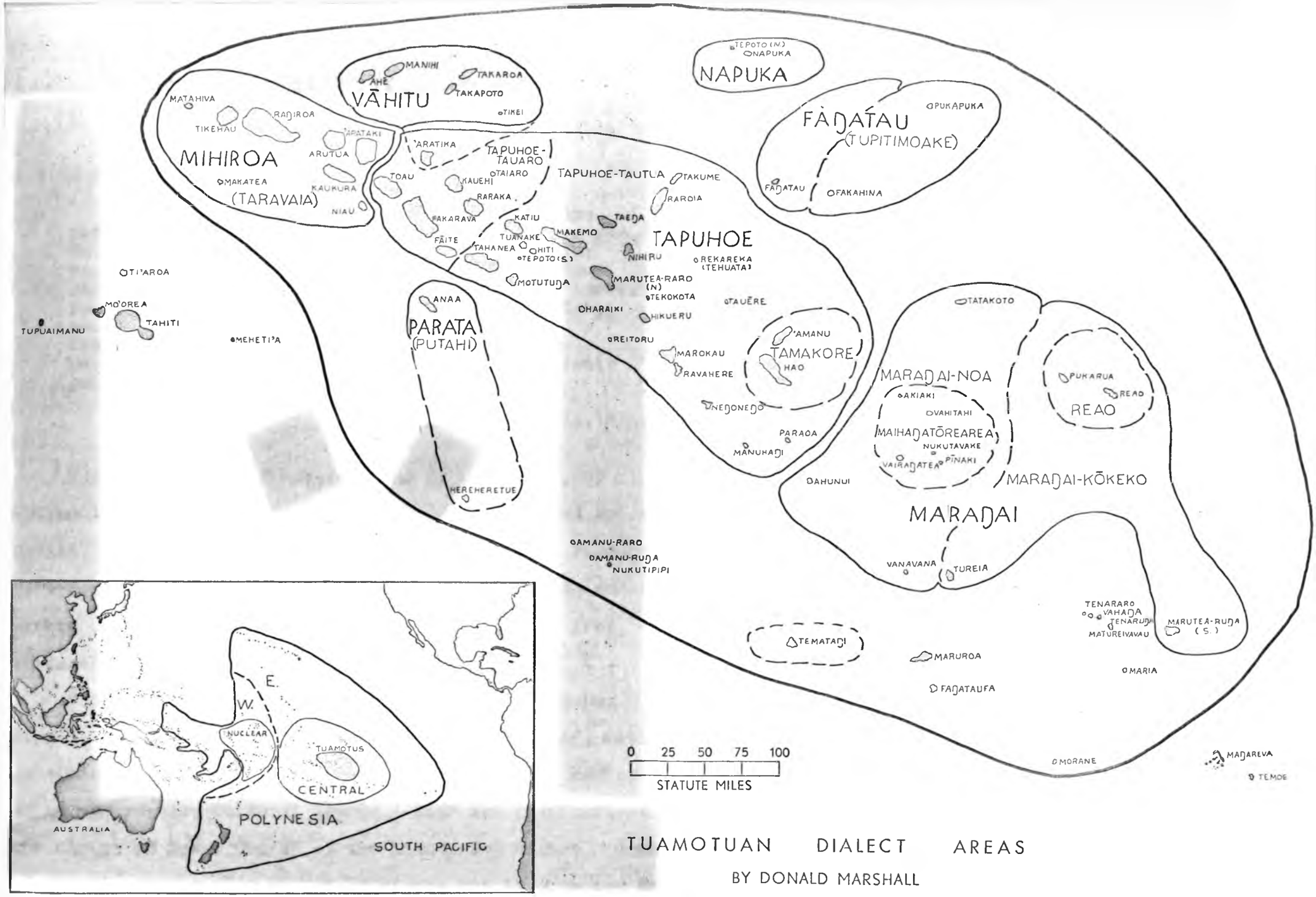
Minor morphemes which occur in the peripheries are first studied in terms of their shapes and meanings. Their distributions are then studied in terms of the order of their occurrences in relation to the nucleus.

Subsequently, major morphemes are studied in terms of their occurrences with minor morphemes and are thus classified into different classes in relation to their occurrence restrictions with minor morphemes. More than one major morpheme occasionally occurs in the nucleus, and behaves as a single major morpheme. This is designated a complex nucleus, to be discussed under the identical heading in my forthcoming Tuamotuan morphology-syntax.



MAP 1

A Map of French Polynesia (from Kennedy, T. F. 1966. A descriptive atlas of the Pacific islands. Wellington, New Zealand. A. H. & A. W. Reed, p. 33).



MAP 2

A Map of Tuamotuan Dialectal Areas (from Stimson 1964, end-paper).

CHAPTER II

INTRODUCTION

2.1 A Summary of Tuamotuan Geography and Culture

> D'une façon générale, il est beaucoup plus difficile de faire de la linguistique statique que de l'histoire. Les faits d'évolution sont plus concrets, ils parlent davantage à l'imagination; les rapports qu'on y observe se nouent entre termes successifs qu'on saisit sans peine; il est aisé, souvent même amusent, de suivre une serie de transformations. Mais la linguistique qui se meut dans des valeurs et des rapports coexistants présente de bien plus grandes difficultés.
>
> --de Saussure (1915:141-142)

Tuamotuan is the first language of nearly 10,000 Polynesians living in the Tuamotuan Archipelago and in Tahiti, both in French Polynesia. In 1967, 6,664 Tuamotuans were reportedly living in the Tuamotuan Archipelago and the number of Tuamotuans living in Tahiti, also as of 1967, was estimated at 2,000 to 2,500.[1]

From ten to fifteen Tuamotuans are at Laie, Oahu, Hawaii, some 30 miles northwest of Honolulu, Hawaii, either as students at the Church College of Hawaii or as employees at the Polynesian Cultural Center. Both are institutions of the Church of Jesus Christ of the Latter-Day Saints. Some Tuamotuans are married to U.S. citizens and live in the United States as entertainers or as housewives. Half of them are in Honolulu, Kaneohe, and Waimanalo, all on the island of

Oahu, Hawaii; and according to Tuamotuans in Tahiti, a few live in California and Miami, Florida. At the Church College of New Zealand, some 80 miles south of Auckland, there are about twenty people from Tahiti, most of whom are, reportedly, Tuamotuans.[2]

The 80 or so atolls, which constitute the Tuamotuan Archipelago, are situated approximately in the middle of the Polynesian Triangle. The geographical location and the life on the Tuamotuan Islands are succinctly described by Edwin H. Bryan, Jr., as below:[3]

> Tuamotuan Islands (also called the Low Archipelago), are a coral island group in the South Pacific Ocean, politically a part of French Polynesia which is a member of the French Community. Situated between latitudes 14° and 25° S. and longitudes 135° and 149° W., the group comprises 75 atolls, scattered over the 1000-mile arc from Makatea (Society Islands) 140 miles northeast of Tahiti, to Mangareva (Gambier Islands). The total land area, all sand and coral, is given as 340 square miles, but it is probably much less. The nickname DANGEROUS ARCHIPELAGO indicates the hazard to ships from many low, poorly charted reefs. The sandy inlets have only brackish ground water and support few kinds of plants, of which the coconut palm is the most valuable, providing timber, fiber, food, drink and the chief export, copra. The lagoon formerly abounded in pearl shell, but these are now so depleted that pearls are rare and the export of pearl shell much reduced. The coconut, pandanus, and a few breadfruit trees furnish, with marine products, a meager subsistence for the inhabitants. Occasionally the atolls are ravaged by tropical cyclones. The islands were discovered in 1606, by the Spanish, and were annexed to France in 1881. Population (1956) 7,500 Tuamotuans, 24 Europeans, 90 Chinese (traders).

THE TUAMOTUS by Ralph Varady (Covit (1964: pp. 157-164)) offers the best account of things Tuamotu. Another

good account may be found in the PACIFIC ISLANDS YEAR BOOK (1963: pp. 173-175).

Half-castes (called Cosmopolitans in Hawaii), who are mostly descendants of surviving crewmen of wrecked ships and runaways from European ships which visited French Polynesia, are not too infrequent among Tuamotuans. They retain the European surnames of their ancestors, although this phenomenon among Tuamotuans may not be as commonplace as in Tahiti and in Hawaii. Anglo-Saxon names are more frequent than French names.

As may be seen from the estimated number of Tuamotuans for different years given by E. H. Bryan, Jr. (Ibid.) and by Mr. Jean Gasmann i.e. 7500 (1956), 7,097 (1962), and 6,664 (1967), more and more Tuamotuans have been leaving the Tuamotuan Archipelago for Tahiti, especially from 1961, onwards. Before this date, the policy of the French administration was to discourage Tuamotuans from coming up to Tahiti and to make them stay on their own atolls. Reportedly, there have always been Tuamotuans coming up to the island of Tahiti, which has always been the metropolis of all French Polynesia. Their number increased considerably in 1961 when the construction of the first airfield in Tahiti started. Laborers were scouted by the French administration from the Tuamotus, especially from the northwestern and central atolls. Tuamotuans of the Mormon faith are reportedly the first to have come up to Tahiti in any large numbers.

It was announced in April, 1963, that five atolls of the Tuamotu-Gambier groups would be used for the French nuclear testing project. C.E.P. (Centre d'Experimentation Pacifique) was subsequently inaugurated in Papeete in the same year and a labor force was again supplied by Tuamotuans for construction work, etc. Some Tuamotuans work on southern atolls such as Mururoa where major atomic bomb experiments were conducted last summer. A great majority of the Tuamotuan labor force for C.E.P. lives in Tahiti, where C.E.P. has its general headquarters. Since the atomic bomb experiments have been continued at least up until this year, many Tuamotuan young men have now settled down in Tahiti, frequently with their wives and children, living on French wages which are even attractive to some Tahitians.[4]

As TAHITI means PARADISE ON THE EARTH full of South Seas romance to everybody in the world (except those who have actually visited the island), Tahiti means civilization, AVENTURES of youth, to many Tuamotuans. It is a Mecca which anybody should pay a visit to at least once in his lifetime.

Many Tuamotuans distrusted Western civilization until a decade or two ago, especially Western medicine and education, because some Europeans and their own educated countrymen had taken advantage of their illiteracy and deceived them in the trade of copra, etc. Now it is not unusual to encounter a young Tuamotuan couple who come up to Tahiti for the delivery of their first baby. It is more

frequent to encounter a whole family who have come up to Tahiti for the education of their child(ren).

Tuamotuans in Tahiti stick together and live in a few limited quarters such as Taunoa, Quartier Mormon, and on a lease land known as CHEZ ADRAM GOBRET among Tuamotuans in Tahiti. Their life in Tahiti is frequently more primitive than it must have been on their own atolls. Still, they continue to come up to Tahiti, abandoning their relatively spacious and clean houses on their own atolls only to find themselves in match-box-like cottages typically made of plywood.

In certain atolls of the Tuamotuans, the decrease in population in the past five years is reported to be as high as 50%. Examples are Fakahina, Takume, Hikueru Raroia, and Nihiru. The eastern and northern islands such as Napuka are less depopulated, except Tureia.

Tuamotuans also leave their own atolls for specific reasons peculiar to each atoll. A general reason, however, is because they want to obtain more cash, which is easier to obtain in Tahiti, provided they work. They are now aware of the existence of many modern conveniences and commercial items which are far more expensive to obtain on their own atolls than in Tahiti. On the other hand, there are few items in the Tuamotus for which they can get cash.

The Tuamotuans are probably the most Polynesian of all Polynesian peoples today in the Pacific region in that they

still remain the most restless "Wandervögels," always hopping from one atoll to another. (v. Hatanaka (1967: 173-194). Tuamotuans refer to this innate wanderlust as / ori+haere+noa / from /ori/ 'to wander around,' /haere/ 'to go' and /noa/ 'non-restriction' (a grammatical particle).

Before schooners were introduced and began to sail from one atoll to another, with their base in Papeete, Tahiti, the Tuamotuan /ori+haere+noa / in a tiny outrigger canoe seems to have been limited to neighboring atolls. Now, a / ori+haere+noa / from the central atoll of Hikueru to a western atoll of Takaroa and probably ending up in Tahiti, for example, is not infrequent.

Another factor that promotes the Tuamotuan wanderlust is the fact that children are often not raised by their own parents, but frequently by their grandparents or by utter strangers from other atolls. This phenomenon is also observable in other parts of Polynesia, but in the case of Tuamotuan Archipelago, it involves other atolls hundreds of miles away.[5]

Obviously, the introduction of modern transportation facilities, namely schooners, has promoted these tendencies all the more. Although schooners are not regularly scheduled, Tuamotuan atolls are no longer isolated from the outer world.[6]

Tuamotuan is one of the five Polynesian languages spoken in French Polynesia, the other four languages being

Tahitian, Marquesan, Mangarevan and (the language of) Austral (Islands).

". . . Tuamotuan . . . is clearly an east Polynesian language . . ." says Biggs (1965: 378). All other major scholars in Polynesian and Oceanic linguistics the world over seem to agree on this point as may be seen in Walsh-Biggs (1966a), Biggs (1967b), Capell (1962), Dyen (1963, 1965), Elbert (1953), Emory-Sinoto (1959), Emory (1963), Grace (1959), Green (1963) and Pawley (1966). With regard to relations of Tuamotuan to other Oceanic and Polynesian languages, no further comment will be made herein, the purpose of this thesis being to describe the structure of contemporary spoken Tuamotuan.

To Tuamotuans of today, their land is / tua+motu / and the language and the people are /pa'u+motu /.

The dialectal differences claimed by Stimson (1964: 22-24 and end-paper maps) are apparently diminishing rapidly, if any striking differences ever existed. I was able to locate and work with Tuamotuan speakers from only two of the four alleged major dialects, i.e. the speakers of the Vahitu and Tapuhoe dialects in the northwestern and central atolls. As far as I have noticed, the dialectal differences claimed by Stimson and some (but very few) native Tuamotuans are limited to marginal content words. The only major difference noted is that the speakers of the Vahitu dialect

use Tahitian words a little more frequently than those of the Tapuhoe dialect. Grammar, proper, however, remains identical.

In his review of Stimson (1964), Elbert (1965: 1021) comments: ". . . No isoglosses were drawn, few shifts depicted, and the justification for the dialect maps on the end papers is not clear."

Due to the Tuamotuan tendency of / ori+haere+noa /, it seems it would be extremely difficult to draw isoglosses for Tuamotuan. It would be at least extremely time-consuming, because a great many inhabitants would have to be interviewed on many atolls for this task.

Secondly, reaching some atolls is still extremely dangerous. A linguist would most likely be able to visit 20 out of some 80 atolls, but his ship might be wrecked on the reef near the 21st atoll. The best qualified investigator for this task would be a combination of competent linguist and Johnny Weismuller who can fight sharks and rough seas, and live on fish and coconut water.[7]

Thirdly, the investigation would have to be conducted in Tahitian, or hopefully, in Tuamotuan. Even Tahitian is not too desirable because only the older people really know Taumotuan on many atolls and they still remain monolingual. In the light of today's rapid Tahitianization of the Tuamotuan language, nobody might be speaking any more Tuamotuan by the time a linguist masters Tuamotuan and sets out to the Dangerous Archipelago.

In order to avoid the danger of voyages to the atolls, Tuamotuans in Tahiti could be used as informants. They are mostly young people from the northwestern and central atolls. Possibly even the most exhaustive lexical work with them would not help us draw any reliable isoglosses of contemporary Tuamotuan as it is spoken in the Tuamotuan Archipelago. Like thousands of other languages of the world except some major European languages, Chinese and Japanese, Tuamotuan also seems to be destined to disappear from the earth in the not-too-remote future without any reliable dialect studies having been made.

Many Tuamotuans, especially older people living on the Tuamotuan atolls, are still illiterate. Out of some 80 atolls in the Tuamotuan Archipelago, 41 are inhabited, and 36 or 37 of them now have schools, which are all six-year elementary schools.[8] There are CENTRES SCHOLAIRES INTERÎLES on the three major atolls of Hao, Makemo and Rangiroa (or Ra'iroa), where they have the French version of the American PEACE CORPS and several French youths are serving as school teachers in exchange for exemption from military service.[9] On the atoll of Rangiroa (or Ra'iroa) there is the COURS D'ENSEIGNMENT GÉNÉRAL where the first three years of secondary school education are now given.

Middle-aged Tuamotuans who can read and write either have been to Tahiti for schooling or are a product of personal efforts by religious groups such as Bishop Mazé's labors since 1919 on the atoll of Hikueru.[10]

Education is given all in French by French and Polynesian teachers both in the Tuamotuan Archipelago and in Tahiti. No Tuamotuan nor Tahitian is being taught at schools either in the Tuamotuan Archipelago or in Tahiti in spite of the fact that Tahitian, for example, is still the first and everyday language of practically every person born and raised in Tahiti.

Current Tahitian-Tuamotuan orthographies are based upon the Tahitian Bible and the Tahitian version of THE BOOK OF MORMON. They vary from one mission group to another, especially with regard to their use of diacritics, and, like orthographies for a great majority of the languages of the world today, none of them is phonemic.

2.2. Earlier Works

No systematic grammar has so far been published for Tuamotuan. There are a few sketchy notes on Tuamotuan such as Audran (1917, 1918, 1919a, 1919b, 1922, 1929, 1930) and Rey-Lescure (1954), but they are all very short, frequently comparative, or else contain partial lexical information. Klieneberger (1957: 131) lists several other similar works published in English, French, and German.

There are hundreds of pages of texts in Tuamotuan compiled earlier in this century. The most voluminous of all are the 262 pages of texts by Caillot (1914, 1932) and 317 pages of texts by Stimson (1933a, 1933b, 1934). It is believed that there are some partial texts elsewhere under the heading of "folklore," etc. as in Henry (1928), especially in old issues of BMB and BSEO.

Tregear (1893-95) is the first and the oldest Tuamotuan lexicon known. The number of entries is small (76 pages) and it is not too informative. For one thing, a long vowel is not so marked. Equally small is White (n.d.), but it is excellent, first of all in that each entry has at least one sample sentence. Long vowels are also correctly marked for the most part.

A voluminous 623 page dictionary of Tuamotuan was published in 1964. Stimson (1964) under discussion, however, has already been reviewed by at least four authorities in Polynesian linguistics, i.e. Biggs (1965), Elbert (1965) Hohepa (1966a) and White (1965). No comments on this dictionary and the subsequent reviews will be made here, because the entire thesis as presented here is in a sense a partial review of Stimson (1964).

2.3 Tahitianization of Tuamotuan

"Even a hundred years ago, many Tuamotuans could speak Tahitian and used many Tahitian words in everyday speech,"

says White (1965: 520). Many Tuamotuans are now bilingual or nearly bilingual in both Tuamotuan and Tahitian.

In his review of Stimson (1964), Elbert (1965: 1021) states: "Probably a truly contemporary Tuamotu [sic] dictionary would have to include much of Tahitian; this would have been a formidable task as there is no adequate Tahitian dictionary . . ."

Elbert's last comment quoted above is not only correct, but it may also be further stated that all Tahitian words are potential Tuamotuan words in contemporary spoken Tuamotuan whether or not they are actually used as part of contemporary Tuamotuan vocabulary among speakers of Tuamotuan.

Thus, from the point of view of vocabulary, it may not be an overstatement to say that contemporary Tuamotuan is probably one of the richest Polynesian languages in existence, at least potentially, having all Tahitian words as potential or actual Tuamotuan words. In this respect, contemporary Tuamotuan is somewhat parallel to contemporary English in that it has a double vocabulary system, as is illustrated by the following examples, which might be multiplied indefinitely:

(Indigenous Tuamotuan)[11]	(Tahitian -derived Tuamotuan)[11]	
/vae+vae/	/ 'avae /	'foot & leg below knee'
/kope /	/ upe'a/	'net for fishing'
/komo /	/ pape/	'water'

(Indigenous Tuamotuan)	(Tahitian-derived Tuamotuan)	
/namu /	/ nao+nao /	'mosquito'
/ kanehu /	/ matau /	'fish hook'
/ kore+reka /	/ hu'a /	'a little bit (of a thing)'
/ kaefa /	/ taane /	'husband'

(v. Stone (1964: 191-202) for further examples.)

Even more numerous than these formally quite different Tahitian synonyms used in contemporary spoken Tuamotuan in free variation with original Tuamotuan forms, are the Tahitian words which are cognates with original Tuamotuan forms and differ only with regard to their use of /'/ (glottal stop) instead of /k/ or /g/ (voiced velar nasal). e.g.:

(Tuamotuan)[12]	(Tahitian-Tuamotuan)[12]	
/koe/	/'oe/	'you, singular'
/kere+kere/	/'ere+'ere/	'black'
/ raa+kau /	/ raa+'au/	'tree'
/tagata/	/ta'ata/	'person, man'
/mago/	/ma'o/	'shark'
/matagi/	/mata'i /	'to blow (said of wind)'

and hundreds of others.

There is strong evidence that the phoneme /'/ (glottal stop) is a recent addition to Tuamotuan due to Tahitian influence.

First of all, an extremely high degree of fluctuation is observed between /k/ and /'/ and also between /g/ and /'/ in contemporary spoken Tuamotuan, as the above examples suggest. Further investigation reveals the fact that these two fluctuations occur when the Tuamotuan words containing /k/ or /g/ also occur in Tahitian with a simple mechanical replacement of the /k/ or /g/ by the glottal stop /'/.

On the other hand, the Tuamotuan /k/ and /g/ do not usually fluctuate with /'/ when the Tuamotuan words do not have cognate forms in Tahitian.[13] A good example is the Tuamotuan word / haga / (both 'a nominalizing suffix' and 'a plural marker'), which in Tahitian has the functional equivalents of / ra'a/ as a nominalizer and / mau / as a plural marker. The Tuamotuan / haga / thus never fluctuates with / ha'a /.

Finally, the most convincing evidence for the hypothesis that the Tuamotuan /'/ may be a recent addition to contemporary Tuamotuan is the fact that /k/ and /'/ or /g/ and /'/, do not occur together within a single lexical item anywhere in my corpus from Tahiti.

The Tuamotuan word "to blow," for example, is either / paka+kina / or /pa'a+'ina / (but never */ paka+'ina / nor */pa'a+kina /) as in the following examples:

1.) / # ua+paka+kina / / te+matagi # /

2.) # ua+pa'a+'ina / / te+mata'i # /

3.) / # ua+pa'a+'ina / / te+matagi # /

4.) / # ua+paka+kina / / te+mata'i # /

"The wind has blown"

In spite of the general tendency among Polynesian languages toward fewer phonemes, it is considered that Tuamotuan added a glottal stop /'/ to its inventory of consonant phonemes relatively recently. Texts compiled by Stimson and Caillot a few decades ago more or less testify to this fact. Also, both Tuamotuans and Tahitians share the opinion that Tuamotuan possesses /k/ and /g/, although this sort of native opinion is oftentimes not thoroughly reliable.

Hatanaka (1967: 188) mentions OLD TUAMOTUAN and NEW TUAMOTUAN and states, ". . . Father Victor is thoroughly versed in Old Tuamotuan and New Tuamotuan . . ." etc. Unfortunately, the OLD TUAMOTUAN is not defined by her, but at least from the viewpoint of lexical items, there is no doubt that Tuamotuan has undergone considerable change during the past century or so. An example is * / ua / 'rain' as listed in Caillot (1914) which is exclusively / toiti / in contemporary spoken Tuamotuan. There are many words in older texts as in Caillot (1914) that are not intelligible to young Tuamotuans today.[14]

Unfortunately, texts compiled in the first three decades of this century are not thoroughly phonemic in that a phonemic glottal stop, as well as phonemically long vowels, are not so marked.

Thus the hypothesis that a glottal stop is a recent loan into Tuamotuan remains a most convincing but educated guess.

Many Tahitian words have replaced or are now replacing Tuamotuan words in the northwestern and central atolls. This tendency is striking, especially on the atolls in the so-called Vahitu area (v. Stimson (1964: 22-24 and endpaper maps)), which have apparently been on the route of European ships and half-native schooners.

Candy Brooks of Stanford University, who, with her husband Bill, spent nine months on the atoll of Manihi while engaged in anthropological research, writes: "We have found that here on Manihi, Ahe, Takaroa and Takapoto, although all of the people know Tahitian (and the movement into Tahiti of the people strengthens this), most of them also know the local Tuamotuan dialect and use it interchangeably with the Tahitian in daily conversation. As would be expected, the older people are more completely sure of their responses when we ask them for specific Pa'umotuan terms."[15]

A short text compiled not too long ago by Paul Ottino (1967: 456-468) on the atoll of Rangiroa in the northwestern Tuamotus is exclusively in Tahitian and clearly indicates this tendency.

Although less professional in Polynesian studies Serge Arnoux, a teacher of English on the atoll of Rangiroa

(or Ra'iroa) also writes:

". . . Though Rangiroa belongs to the group of Tuamotu Islands, the Tuamotuan language is not spoken here. In fact, in all the atolls of the north (Rangiroa, Takihau; Manihi, Ahe) the language used is Tahitian. The Paumotu [sic] Dialect is still used in the islands of the east (Makemo, Hikueru, Marokau, Taenga, etc. . .). . [sic]."[16]

It has been stated to me many times both by Europeans and Tuamotuans in Tahiti that on some northwestern atolls Tuamotuan is no longer spoken. As Candy Brooks says in her note, this statement, however, does not seem to be quite true. The fact appears to be that two languages are now coexisting with Tahitian changing the native Tuamotuan considerably and with the entire Tuamotuan language gradually being replaced by Tahitian.[17]

Especially in Tahiti where a Tuamotuan is more or less regarded as an UNTOUCHABLE, the fact that a person is a Tuamotuan does not necessarily mean that he speaks the language. Many young Tuamotuans in Tahiti were BORN in the Tuamotus but were brought to Tahiti so young that many of them hardly remember any Tuamotuan. This tendency is rapidly increasing and even if they live with their Tuamotuan parents, the youngsters often only UNDERSTAND Tuamotuan and do not have a productive command of the language, because their parents are also bilingual in Tuamotuan and Tahitian. The only exception occurs when the grandparents also live

with the youngsters. In many cases, however, the young Tuamotuans in Tahiti speak French with their friends,[18] and Tahitian to respond to their parents when spoken to in Tahitian-Tuamotuan.

Dr. Biggs is of the opinion that three Polynesian languages are most likely to survive as national languages for many more years to come in light of the present number of speakers and relative prestige of the languages.[19]

These are Samoan, Tahitian, and Tongan. Judging from what I saw and heard last summer in Tahiti, I am inclined to agree with his prediction about Tahitian, for more and more Tuamotuan youngsters are beginning to speak only Tahitian and vernacular French, thus forgetting the language of their ancestors.

"The child learns to speak like the persons around him," said Bloomfield (1933: 43). Now that many Tuamotuans are abandoning their own atolls, it is perhaps too demanding to wish that they would retain their ancestral language.

NOTES

[1]Personal communication dated February 15, 1968, from Mr. Jean Gasmann, administrator of the Tuamotuan Archipelago through Mr. Yves Lemaître, teacher of mathematics at Lycée Paul Gauguin, Papeete, Tahiti.

[2]Personal communication dated March 31, 1968, from Mr. Chris Corne of the Department of Romance Languages, University of Auckland, Auckland, New Zealand.

[3]Encyclopedia Americana (1965 edition: 27, 190-191).

[4]According to Henriette, Tahitian wife of my Tuamotuan informant Tekeheu Munanui, a large number of Tuamotuans also came to Raiatea, her home island and the legendary home of the Tahitians, several years ago, for some construction work, and have settled down there.

[5]Let us take my English-speaking (and quadri-lingual) informants here in Hawaii, for example. Although Marguerite White, age 18, was born in Tahiti as a mixture of Irish, English, Spanish, Ameriandian and Tahitian, she was taken to the atoll of Hikueru by an utterly strange Tuamotuan couple (who probably found the baby cute) on the fifth day after birth, and lived on the atoll until she was ten. She was then taken back to Tahiti for further schooling. Tekeheu Munanui, age 29, was born in Tahiti also, son of a Chinese

man and a Tuamotuan girl from the atoll of Hao. He was raised by his grandparents on Hao. He went to a Protestant school in Tahiti, a Mormon high school in Tonga, and is now a student of mathematics and education at the Church College of Hawaii. He has a copy of his genealogy written in octopus ink for him by his Tuamotuan grandfather.

[6]Mr. Douglas Yen, presently of the Bishop Museum, says that for a non-Tuamotuan to be on any Tuamotuan atoll is still like being left out all alone in the middle of the Sahara Desert (a personal conversation in Papeete, Tahiti in August 1967).

[7]According to Jérome Tsong, a Berkeley-educated Chinese friend in Tahiti, a graduate student in linguistics from a Midwestern U.S. university went to a central atoll some five years ago and nobody has seen or heard from him since.

[8]Personal conversation with Mr. Yves Lemaître on September 7, 1968, at the University of Hawaii on the basis of information he gathered from Mr. Jean Gasmann, Administrator of the Tuamotuan Archipelago.

[9]Personal conversation with Dr. Paul Ottino of ORSTOM of Papeete and also formerly of Bishop Museum of Honolulu, in May, 1967, in Honolulu; and with Mr. Philippe Lenoir, teacher of English at Lycée Paul Gauguin of Papeete, and with several others in July, 1967, in Tahiti.

[10]Personal conversation with Bishop Maze of the Catholic Mission in Papeete, summer of 1967.

Tuamotuans today are all Christians. According to Mr. Gasmann 90% of them are Catholics and the other 10% are members of the Mormon churches, most of whom live on northwestern atolls. In view of this situation, the influence which the Tahitian Bible and the Tahitian version of the Book of Mormon must have had for the past century upon the other four Polynesian languages spoken in French Polynesia cannot be ignored, because these are the only bibles used in French Polynesia.

[11]Indigenous Tuamotuan words and Tahitian-derived Tuamotuan words are those which are regarded BY NATIVE SPEAKERS OF TUAMOTUAN as indigenous Tuamotuan and Tahitian-derived Tuamotuan words, respectively. It has been pointed out by Dr. Biggs that at least some cases of the above-mentioned Tahitian-derived Tuamotuan words such as /nao+nao/, /matau/, and /taane/ are usual Polynesian words that can be reconstructed as Eastern Polynesian or even proto-Polynesian words and that they might be archaic indigenous Tuamotuan forms.

My personal speculation on the basis of the contemporary native Tuamotuan reaction is that it is most likely that the Tahitian-derived Tuamotuan words listed here are recent borrowings from contemporary Tahitian, ALTHOUGH THEY MIGHT

HAVE EXISTED IN TUAMOTUAN ITSELF AS INDIGENOUS FORMS CENTURIES AGO.

[12]As is always the case with any other languages with a double vocabulary system, closer scrutiny of the areas of meaning of the pairs of Tuamotuan words and their Tahitian cognates, reveals a slightly more complicated state of affairs. This point will be discussed on some other occasion in detail.

[13]The fluctuation between /k/ or /g/ and /'/ does occur to a certain degree in Tuamotuan lexical items not shared by Tahitian. The reason is a carryover of the above-mentioned Tuamotuan-Tahitian phonemic correspondence or a case of so-called FOLK ETYMOLOGY or is sometimes a slip of the tongue.

[14]Personal conversation with Tekeheu Munanui in August, 1968, in Honolulu and Laie.

[15]Personal communication of May 9, 1967, from Manihi. This point was further discussed in person when the Brooks came up to Tahiti for a break during the month of July.

[16]Personal communication of July 17, 1967 from CLUB MEDITERRANÉE, Tiputa, Rangiroa.

[17]Bishop Mazé even stated that of 78 [sic.] Tuamotuan atolls, the western atolls are Tahitian-speaking and the

eastern atolls are still Tuamotuan-speaking, placing a border-line on his beloved Hikueru. (Personal conversation with Bishop Mazé in Papeete, August 1967.) The first half of his statement is not really true, as attested by Candy Brooks and others, but his statement as a whole gives a very reliable general picture of contemporary Tuamotuan dialectology. In light of varying distances from Tahiti to different groups of Tuamotuan atolls, this broad generalization also seems plausible. My informants also attest to the fact, saying that on the eastern atolls a glottal stop /'/ is not yet used, especially on Reao. They also place a border-line around the Hao-Hikueru area. (Conversation with Tekeheu Munanui from Hao and Marguerite White from Hikueru in Laie and Honolulu, Oahu, Hawaii, June 1968.)

[18]Besides the standard French spoken by Europeans, there is a Tahitian dialect of French spoken by Polynesians, similar to Hawaiian Pidgin English.

[19]Personal conversation with Dr. Biggs in Papeete, Tahiti, summer, 1967.

CHAPTER III

SUMMARY OF PHONOLOGY

3.1 Inventory of Phonemes

A phoneme is a class of phonetically similar and non-contrastive phones. Usual tests of complementation and contrast yield the following phonemes.

3.1.1 Segmental Phonemes

(a) consonants

stops /p,t,k, '(glottal stop)/

fricatives /f,h,v/

nasals /m,n,g/

median[1] /r/

(b) vowels

TABLE 1
TUAMOTUAN VOWEL PHONEMES

	front unrounded	central unrounded	back rounded
high	/i/		/u/
mid	/e/		
low		/a/	/o/

Short vowels contrast with identical long vowels. Thus, vowel length is phonemic. Since a number of non-identical vowel pairs occur in Tuamotuan, they are interpreted as pairs of identical vowels and are presented by doubling the vowels in all cases. (v. Pike (1947: 61a))

3.1.2 Suprasegmental Phonemes

Besides the above-mentioned sixteen segmental phonemes, there are the following five suprasegmental phonemes:

(a) junctural phonemes

/#/	final juncture
/ // /	non-final juncture
/ + /	plus juncture
/.../	hesitation

(b) other suprasegmental phoneme

/ ˇ /	phrase stress

Phonetically, four to five different levels of pitch are observed within a phonological sentence[2] (i.e. a stretch of speech bordered by two final junctures). Intonation is sure to be phonemically contrastive for a number of otherwise segmentally identical sequences of phonemes, but the analysis has not gone far enough to detail the pitch phonemes. Pitch levels have been marked on a number of sentences transcribed in phonetic symbols. Brief generalizations of intonational contours are made in the description of junctures.

3.2 Summary of Phonology

Glottal stop is a recent addition to Tuamotuan from Tahitian. It occurs in free variation with /k/ and /g/ (velar nasal) in a number of lexical items shared both by Tahitian and Tuamotuan. It also occurs in a great many Tahitian loans used in contemporary Tuamotuan. (v. § 2.3)

Glottal stop is also frequently used before utterances beginning with a monophthongal vowel.[3] In the latter case, glottal stop is interpreted as an intrusive along with the other intrusives, i.e. [y], [w], and perhaps /r/. (v. § 7.3.5.)

Phonetically, two types of stress occur; (1) phrase stress and (2) primary stress. Primary stress occurs predictably on a vowel penultimate to any of three junctures, i.e. final, non-final and plus (i.e. /#, //, +/) and is non-phonemic. (v. § 6.3.3.1)

In fast styles of speech, a vowel immediately before final juncture (i.e. /#/) may be devoiced. (v. § 6.3.3.2.2). Also, certain vowels in vowel clusters may be semi-vocalized. (v. § 6.3.3.2.3). Both devoiced and semi-vocalized vowels do not count in predicting the occurrence of primary stress, and primary stress still occurs on the full vowel penultimate to any of the three junctures. Thus, the fact that primary stress occurs on a vowel penultimate to any juncture is applicable to both slow and fast styles of speech.

Phrase stress is largely predictable, occurring on the last primary stress available within a phonological phrase (v. Chapter I). It occasionally occurs at an unexpected place. In the latter case, it has a meaning of 'contrastive emphasis' and is thus a phoneme and a morpheme at the same time, but with relatively low functional load. (v. § 6.3.4)

No mention of syllable is necessary in connection with stress. Syllable is discussed in this thesis, only because it serves as a convenient reference point for the discussion of phonotactics. Syllabic structures of Tuamotuan are V, CV, VV, CVV, VVV and CVVV. (v. § 7.1 and 7.2)

A vowel is phonetically heard not only as a short vowel, a long vowel but also anywhere in between in a well-defined environment, i.e. V_1 in /=(C)V_1(C)V_2(C)V_3=/.[4] This feature is tentatively designated BLENDING in this thesis. Primary stress which occurs on V_2 is considered to be responsible for the occurrence of BLENDING over V_1 in the above-mentioned environment. (v. § 8.1.)

In spite of the fact that vowel length is phonemic, a long vowel is in free variation with a short vowel in a limited number of lexical items, as are listed in § 8.2, when such lexical items do not bear phrase stress. This is clearly a case of neutralization between a short and a long vowel. (v. § 8.2)

It is suspected that the whole language is rapidly changing due to the strong political, economical and

cultural influences of Tahitian. (v. § 2.1 and § 2.3). The day might come when the author of the present thesis is the only speaker of Tuamotuan on the earth.

NOTES

[1]For a definition of a MEDIAN, see Gleason (1955: 252).

[2]For the definition of a phonological sentence, see §.6.2.1.

[3]By a MONOPHTHONGAL VOWEL is meant a vowel in utterance-initial position not preceded by any intrusives. To be discussed in detail in §.7.3.

[4]An equal sign ([=]) used here stands for any of the three junctures, i.e. final, non-final and plus junctures (/ #, //, + /) to be discussed in detail in §.6.2.

CHAPTER IV

MINIMAL PAIRS

4.1 Vowels

The following networks of interlocking differences of sound establish the five vowel phonemes of Tuamotuan.

(i)	/piu/	'to roll up'
	/peu/	'manner(s)'
	/pau/	'consumed, used up'
	/pou/	'pole, post'
	/puu/	'trumpet, horn'
(ii)	/pita/	'Peter'
	/peta/	(1) 'to gamble' (2) 'a girl's name'
	/pata/	'butter'
	/pota/	'vegetables, cabbage'
	/puta/	'book'
(iii)	/rita/	'a girl's name'
	/reta/	'blade of a razor'
	/rata/	'letter'
	/rota/	'Lot in the Old Testament'
	/ruta/	'Ruth in the Old Testament'
(iv)	/tere/	'to sail'
	/tare/	'phlegm'
	/tore/	'striped, checkered'
	/ture/	'law'

(v)	/mua/	'foreword'
	/mea/	'thing'
	/maa/	'clean'
	/moa/	'chicken'
(vi)	/tua/	'back (of a person)'
	/toa/	'store (usually used in a compound form of /fare+toa/ (lit. 'a house of store') with the same meaning)
	/taa/	'tar'
	/tea/	'pale light'
	/tiare/	'flower'
(vii)	/ora/	'to live; life'
	/ore/	'raw'
	/ori/	'(to) wander'
	/oro/	'to rub, rasp, grate, scratch'
	/'oru/	'to swell'

4.2 Consonants

The phonemic status of the eleven consonants is established by the following minimal and near-minimal pairs.

(i)	/'apa/	(in free variation with /kapa/) 'a type of dance and singing'
	/ata/	'cloud'
/aka/ and /a'a/		'root (of a plant)'
	/ama/	'outrigger'
	/ana/	'cave'
	/ara/	'to wake up'

	/ava/	'a pass in a reef (on many atolls in Tuamotuan Archipelago which is suitable for larger vessels)
	/'afa/	'half; to divide'
	/aha/	'what? (i.e. a fast form of /e+aha/ with the same meaning)'
	/hoa/	'friend'
	/roa/	'long; extremely'
(ii)	/pae/	'five'
	/kaefa/	'husband'
	/tae/	'to arrive'
	/'aero/(but not */kaero/ nor */gaero/)	'tail'
	/mae+mae/	'to wither'
	/naero/	'nail'
	/gaero/ (but not */'aero/)	'sand'
	/haere/	'to go'
	/vae+vae/	'foot and/or leg'
	/vaere/	(in free variation with /vavere/) 'to clean land of underbrush'
	/rae/	'forehead'
(iii)	/apo/	'to catch (a thing thrown in the air, with both hands)'
	/ato/	'to thatch a house'
	/a+ko+nei/ /#a+ko+nei+vau// e+paa+karatai//ia+'oe#/	'at the end, finally, 'as in: 'At the end I will hit you.'
	/a'o/	'to advise'
	/amo/	'to lift (a heavy thing)'

	/aro/	(1) 'to fight' (2) 'a (human) face'
	/afoo/	'a Chinese man's name'
	/aho/	'breath'
(iv)	/'upa+'upa/	'accordion'
	/uta/	'toward the mountain'
	/u'a/ and /uga/	'hermit crab'
	/ura/	'to burn with flame'
	/ufa/	'female of an animal'
(v)	/toa/	'store'
	/koari/	'very hungry'
	/'oa+'oa/	'happy'
	/moa/	(1) 'chicken' (2) '(human) testicle'
	/noa/	(1) 'Noah in the Bible' (2) 'non-restriction' (a grammatical word)
	/igoa/	'name'

4.3 Long vs. Short Vowels

The following minimal and sub-minimal pairs establish the phonemic contrast of the long vowel with the short vowel.

(a) /i/ vs. /ii/

(i)	/'api/	'page'
	/'aa+pii/	'new; young'
(ii)	/mimi/	'to urinate'
	/mimii/ and mii+mii/	'cat'

(b) /e/ vs. /ee/

(i)	/fefe/	'bent, curved'
	/fee+fee/	(in free variation with /kota/) 'boil'
(ii)	/'e'e/	'saw (an instrument)'
	/'e'ee/ and /'ee+'ee/	(in free variation with /kekee/ and /kee+kee/) 'armpit'
(iii)	/tete/	(1) 'to chatter (as teeth from the cold)'
		(2) 'to chip off the roughness of wild mother-of-pearl using two pieces of shells and/or a knife'
	/tetee/ and /tee+tee/	'basket for pearl diving'
	/tee+tee/	(1) in free variation with /tii+tii/ 'breasts, teats'
		(2) 'a diver's helper (in pearl fishing)'

(c) /a/ vs. /aa/

(i)	/papa'i/	'wall'
	/paa+pa'i/	'to write'
(ii)	/vavaa/	'to make a hissing sound'
	/vaa+vaa/	'a dumb-mute'
(iii)	/aka/	'root (of a plant)'
	/'akaa/	'a girl's name'
(iv)	/tara/	'horn' (as in /tara+pua+toro/ 'horn of a cow')
	/taraa/	'five French Pacific francs or a coin thereof'
(v)	/tapu/	'a personal name'
	/taa+puu/	'to cut'

(vi)	/hoa/	'friend'
	/hoaa/	'lake'
(vii)	/'afa/	'half; to divide'
	/'afaa/	'split'
(viii)	/tirara/	as part of a set phrase: /tirara+ihoa+ia/ 'That is too bad.'
	/tiraa+raa/	(fast form of /teraa+raa/) 'however'
(ix)	/matau/	(in free variation with /kanehu/) 'fish hook'
	/maa+tau/	'to be accustomed to'
(x)	/taa+maruu/	(in free variation with /tama+ruu/ which is a fast form in natural speech, and with /ha'a+maruu/) (1) 'to make soft' (2) 'to lower the temperature (of an oven, etc.)'
	/tamaru/	'balcony (of a house)'
(xi)	/papa/	'rock, foundation' (in the Bible and used almost exclusively in a biblical discussion)
	/paa+paa/	'father, daddy'
(xii)	/mama/	'to leak, escape'
	/maa+maa/	'mother, mom'
(xiii)	/'apa/	(in free variation with /kapa/) 'a type of dance and singing'
	/'apaa/	'to kiss'

(d) /u/ vs. /uu/

(i)	/tapu/	(1) 'to curse' (2) 'a man's name'

/tapuu/ (1) 'private'
(2) (in free variation with /taa+puu/) 'to cut'

(ii) /pupu/ 'group'

/pupuu/ and /puu+puu/ 'to offer a sacrifice'

/puu+puu/ 'shell-fish'

(iii) /paapu/ 'Bob'

/paa+puu/ 'sure, definite, certain'

(iv) /tama+ruu/ (a fast form of /taa+maruu/)
(1) 'to make soft'
(2) 'to lower the temperature (of an oven, etc.)'

/tamaru/ 'balcony'

(v) /tumu/ 'reason'

/tumuu/ and /tuu+muu/ 'dull (of a knife, etc.)'

(e) /o/ vs. /oo/

(i) /'ona/ 'rich'

/'oona/ 'he, she, (it)'

(ii) /tona/ 'warts'

/toona/ 'his, her (intrinsic possession)'

CHAPTER V

SEGMENTAL PHONEMES

5.1 Description of the Segmental Phonemes

The phonetic symbolization used here and throughout the thesis follows Smalley (1964). In addition I use the symbol [H] to indicate slight aspiration. Phonetic transcriptions[1] are not given for most the examples given phonemically, partly in order to save typing difficulty but primarily because many in-between cases have been observed concerning aspiration of stops /p,t,k/ etc.

5.1.1 Consonant Phonemes

As a general feature of Tuamotuan consonantal phonemes, it may be stated that a non-initial consonant immediately before a stressed vowel, such as /t/ in /'atama/ 'Adam', is phonetically slightly longer than a consonant in other positions. This phonetic lengthening of consonants is considered to be associated with the general tenseness of the articulatory apparatus preceding the stressing of a vowel.

5.1.1.1 Stops

Several general features concerning the stops /p,t,k/ may be conveniently made at this point.

First of all, Tuamotuan /p,t,k/ are observed to be modified by the next consonant (except when they are immediately followed by the vowel /i/), as may be seen from

the following description of the allophones of Tuamotuan /p,t,k/. As far as /p,t,k/ are concerned, these consonant phonemes behave independently of their neighboring vowels. This feature of Tuamotuan is in accordance with the fact that the presence or absence of a consonant before any vowel in the typical domain of Tuamotuan primary stress does not count in predicting the occurrence of primary stress which is diagrammed as / =((C)V)(C)V́(C)V= / in § 6.3.3.1.

Whereas fortis articulation and aspiration are often found to co-occur in the articulation of /p,t,k/, as in English, the opposite is true in Tuamotuan where, generally speaking, lenis articulation and aspiration tend to co-occur. On the other hand, fortis articulation of stops is marked by an absence of noticeable aspiration or is accompanied only by slight aspiration at most.

5.1.1.1.1 /p/

/p/ is a voiceless bilabial stop with allophones [p̰ʰ; p̣; p̲, pᴴ, pʰ; p̤][2] which are distributed as follows:
(a) When the consonant following /p/ is one of the voiced intervocalic pharyngealized allophones of /h/ described in § 5.1.1.2.2 (and unless it is immediately followed by /i/ as in /piha/ 'room'), the stop /p/ is pharyngealized and is also aspirated. ([p̰ʰ]). This is the only consistently aspirated allophone among all the allophones of /p/.

e.g.

/pahure/ 'scratched'

/paha/	'probably'
/puhi/	'snake'
/puhi+puhi/	'to smoke (cigarettes)'

/p/ in this environment, however, is less pharyngealized by the voiced pharyngealized allophones of /h/ than are /t/ and /k/ in the same environment, perhaps due to the fact that points of articulation for /p/ and the voiced pharyngealized allophones of /h/ are farther apart, compared to those for /t,k/ and the voiced pharyngealized /h/'s.

(b) When the consonant following /p/ is the glottal stop /'/, what I call GLOTTALIZED /p/ ([p̀]) occurs.

e.g.

/pa'a+pa'a/	'sunburned'
/popa'a/	'white man'
/pe'a+pe'a/	'worry'
/tupa'i/	'to fight'

(c) Before the high vowel /i/, the stop /p/ is lenis with some degree of aspiration, ([p̯], [p^H], [p^h] or a combination thereof).

e.g.

/pirau/	'pus'
/pito/	'navel'
/piri/	'sealed, closed'
/pipi/	'peas'
/tipi/	'knife'

/tapi/	'a boy's name'
/piti/	'two'

/p/, as in /'opihi/ 'a kind of shellfish' and /piha/ 'room', is lenis with some degree of aspiration and is not pharyngealized. Thus environment (c) has priority over environment (a).

(d) In other environments, the following general conditioning factors operate. Before unstressed vowels (v. § 6.3.3), there is a general tendency toward lenis articulation and aspiration. ([p̲], [p^H], [p^h] or a combination thereof). In other environments, /p/ is fortis and little aspirated. ([p̅]).

e.g.

/kara+poga/	'throat'
/tapono/	'shoulder'
/roo+puu/	'buttocks'
/paru/	'fish'
/pupuru/	'thick'
/repo/	'dirt'
/pepe/	'butterfly'
/pape/	'water'
/pupee/	'doll'
/tepe/	'to mow the lawn'
/tope/	'to trim'

5.1.1.1.2 /t/

/t/ is a voiceless blade dento-alveolar stop with allophones [$\underset{\sim}{t}^h$, ($\check{c}^h$); $\dot{t}$; $t^{=}$; $\underset{\wedge}{t}$, t^H, t^h, (t^y), $\underset{\varepsilon}{t}$, t^H, t^h; $\underset{\shortparallel}{t}$] which are distributed as follows:

(a) When the following consonant is either of the intervocalic voiced pharyngealized allophones of /h/ described in § 5.1.1.2.2. (and unless it is immediately followed by /i/), the stop /t/ is pharyngealized and is also aspirated. ([$\underset{\sim}{t}^h$]). This is the only consistently aspirated allophone among all the allophones of /t/.

e.g.

/tahe/	'to run, flow'
/tahi/	'certain'
/tahito/	'ancient'
/tahiti/	'Tahiti'

Occasionally, in natural speech, this allophone will occur even when /t/ is separated from the following /h/ by /+/. It may be alternatively stated that, in natural speech, presence or absence of /+/ between /t/ and a following /h/ does not affect the general rule of Tuamotuan /p,t,k/ (already stated in § 5.1.1.1) that they are modified by an immediately following consonant. Like any other /t/ directly followed by /h/, /t/ in the following examples, is occasionally pharyngealized and aspirated. In spite of an immediately preceding /+/, /h/ becomes voiced because of its pseudo-intervocalic position, as is further explained in

§ 5.1.1.2.2. /t/ in its turn becomes pharyngealized and aspirated due to the following voiced /h/.

e.g.

/te+ha'ae/	'the spit'
/te+hauga/	'the smell'
/te+haere+nei/	'is, am, are going'

In one extremely common expression /te+haa+koi/ 'the chap, fellow', the fast speech form of /t/ is [c^h], and /e/, /+/ and /h/ are lost, the entire expression resulting in [$\check{c}^h\acute{a}$:k̠$\acute{o}$i].

No other instances of this allophone have been noted and only one of my informants used it.

(b) When the following consonant is /'/ (glottal stop), what I call GLOTTALIZED /t/ ([t̚]) occurs.

e.g.

/ta'a/	'to know, understand'
/ato'a/	'also'
/to'oe/	'your (intrinsic possession)'
/te'a/	'bow and arrow'
/mai+ta'i/	'good, well'

(c) Before the high vowel /i/, /t/ is fronted and lenis with some degree of aspiration. ([t̪], [t^H], [t^h] or a combination thereof).

e.g.

/miti+kau/	'finger nail'
/tino/	'body'

/katiga/	'food'
/tii+tii/	'breast'
/'ati/	'disaster'
/iti/	'small'
/oti/	'to finish'
/peti/	'a variety of fish'
/miti/	'salt'
/piti/	'two'
/matie/	'grass, good'

As in the case of /p/, this environment has priority over environment (a). Some speakers use a palatalized allophone [t^y] in this environment.

(d) In other environments, the following general conditioning factors operate.

Before unstressed vowels (v. § 6.3.3), there is a general tendency toward lenis articulation and aspiration. ([t̪], [t^H], [t^h] or a combination thereof). Before stressed vowels, /t/ is fortis and little aspirated ([t̪]).[3]

e.g.

/tua/	'back (of body)'
/tagata/	'man'
/toreu/	'big'
/teina/	'younger sibling of the same sex'
/ata/	'cloud'
/tuu+tagi/	'to cry aloud'

/kata/	'to laugh'
/gutu/	'louse'
/tuu+raki/	'to push'

5.1.1.1.3 /k/

/k/ is a voiceless back-velar stop with allophones [k̰^{h}; k̂, k^{H}, k^{h}; k̯, k^{H}, k^{h}; k̤] which are distributed as follows:

(a) When the following consonant is either of the inter-vocalic voiced pharyngealized allophones of /h/ (and unless it is immediately followed by /i/), the stop /k/ is pharyngealized and is also aspirated. ([k̰^{h}]). This is the only consistently aspirated allophone of /k/.

e.g.

/kahu/	'clothes'
/kahora/	'smoke'
/ka+hora+hora/	'outside'
/kahaa/	'a girl's name'

(b) Before the high vowel /i/, the stop /k/ is lenis with some degree of aspiration ([k̂], [k^{H}], [k^{h}] or a combination thereof).

e.g.

/kaa+kii/	'neck'
/keiga/	'bone'
/kee/	'different, original'
/maki/	'sick'

/terake/	'that (something undesirable or behind the speaker)'
/hiki/	'side'
/kimi/	'to look for'
/tiki/	'sculpture (usually representing a man)'

(c) In other environments, the following general conditioning factors operate.

Before unstressed vowels (v. § 6.3.3.), there is a general tendency toward lenis articulation and aspiration. ([k̯]), [k^H], [k^h] or a combination thereof). In other environments, /k/ is fortis and little aspirated. ([k̟]).

e.g.

/tooku/	'my (intrinsic possession)'
/kota/	'boil, tumor'
/kaa+nehu/	'to fish with a hook and line'
/koo+rua/	'you two'
/kaa+efa/	'husband, man'
/katu/	'to climb'
/koo+kiri/	'the trigger fish (a Tuamotuan name given to the present writer by Tuamotuans in Tahiti)'
/kakati/	'to bite'
/paka+kina/	'to blow; to sound'

5.1.1.1.4 /'/

/'/ is a glottal stop.

e.g.

/'ete/	'basket'

/'oe/	(in free variation with /koe/) 'you'
/'ori/	(in free variation with /kori/) 'dance'
/o'e/	(in free variation with /oge/) 'famine'
/va'u/	'eight'
/ho'e/	'one'
/tia'a/	'shoes'

Glottal stop /'/ causes what I call laryngealization of its neighboring vowels ([V̊]), usually those directly following it, although the exact phonetic feature of what I call laryngealization is yet to be investigated. This laryngealization, however, is non-phonemic. (v. § 5.1.2.1.4.) More than one vowel may be affected by /'/ and laryngealized.[4]

e.g.

/to'o̊e̊/	'your (intrinsic possession)'
/ta'o̊e̊/	'your (extrinsic possession)'
/ha'å̊pi'i̊ra'å̊/	'school, study'

Articulation of the glottal stop /'/ at utterance-initial position is acoustically weaker than in utterance-medial position, and is occasionally hard to detect.

Utterance-medial glottal stop is stronger than the utterance-initial one, but it occasionally diminishes so much that its presence can be detected only by the presence of the following pharyngealized vowel.[5]

e.g.

/fa'ʔa'ʔa/	'a place name, i.e. the airport of Tahiti'

5.1.1.2 Fricatives

5.1.1.2.1 /f/

/f/ is invariably a voiceless labio-dental fricative.

e.g.

/fare/	'house'
/fara+oa/	'flour'
/fa'a+ito+ito/	'to encourage'
/fa'a+tere/	'manager'
/fiu/	'weary, tired'
/'ifoo/	'must (a verbal minor morpheme)'
/'afa/	'half'
/mafatu/	'heart'
/'ofe/	'bamboo'

5.1.1.2.2 /h/

/h/ is a voiceless flat glottal fricative with allophones [x̂, x; ĥ, h], which are distributed as follows: (a) In the environment /i/ ___V (i.e. preceded by the vowel /i/ and followed by any vowel) /h/ is a voiced pharyngealized grooved velar fricative ([x̂]) in faster deliberate speech and in natural speech. In slower deliberate speech, voiceless grooved velar fricative ([x]) occurs in free variation with the former, in the same environment.

e.g.

/ihu/	'nose'
/niho/	'tooth'
/vihi/	'skinny'
/iho/	'self'
/ihoa/	'inevitableness'
/tiho/	'anus'

(b) Intervocalically (except after /i/) in faster deliberate speech and in natural speech, /h/ is a voiced pharyngealized flat glottal fricative ([ĥ]).

e.g.

/aho/	'to breathe, breath'
/rehu/	'ashes'
/vaha/	'place'
/gahu/	'to bark (of dog)'
/aha/	'what'
/kahu/	'clothes'
/noho/	'to stay, sit down, dwell'
/ohe/	(in free variation with /ofe/) 'bamboo'

The voiced pharyngealized flat glottal fricative ([ĥ]) in intervocalic position is occasionally hard to hear, especially when preceded by the low central vowel /a/, the low back vowel /o/ or the high back vowel /u/, and followed by the high front vowel /i/.[6]

e.g.

/nohi/	'eye'

/vahi/	'place'
/parahi/	'to stay, sit down; good-bye'
/puhi+puhi/	'to smoke cigarettes'
/au+ahi/	'fire'
/vahine/	'woman'
/pahii/	'boat'
/tahi/	(in free variation with /kahi/ in which /h/ is also a voiced pharyngealized flat glottal fricative) 'certain'
/tahiti/	'Tahiti'
/tahito/	'old, ancient'

Very little constriction of any sort in the pharyngeal area is audible in this particular environment and what is audible is a very short general feature of voicing. Thus there is very little difference between the Tuamotuan pronunciation of /tahiti/ and the French pronunciation of TAHITI (as articulated by French-speaking announcers and broadcast over RADIO TAHITI) in which H is not pronounced at all.

In slower deliberate speech, a voiceless flat glottal fricative ([h]) also occurs in the environment under discussion, i.e. in intervocalic position, except when /h/ is directly followed by /i/.

(c) Utterance-initially, a voiceless flat glottal fricative ([h]) occurs. In slower deliberate speech, the same allophone also occurs after final, non-final and plus junctures.

e.g.

/hiki/	'near'
/hoki/	'to return'
/hoko/	'to buy'
/huru+huru/	'hair, feather'
/higa/	'to die'
/haiko/	'very dry'
/tua+hine/	'sister (older or younger)'
/mata+hia+poo/	'first-born'
/haere/	'to go'
/huke/	'to dig'
/hinu/	'pit'

In the speech of some people, /h/ may be voiced regardless of its environment, especially in faster deliberate speech and in natural speech. Even immediately after junctures (especially after plus juncture /+/) /h/ may be voiced in such a case.

/h/ is also responsible for the non-phonemic breathiness of following vowels ([V̤]), usually those directly following it, when /h/ is voiced. (v. § 5.1.2.1.2).

5.1.1.2.3. /v/

/v/ is invariably a voiced labio-dental fricative.

e.g.

/vahi/	'place'
/vaha/	'mouth'

/vahine/	'woman'
/vae+vae/	'foot'
/vai/	'to exist'
/viru/	'to be able to; nice, pretty'
/vana/	'sea urchin'
/heva/	'to cry'
/iva/	'nine'
/'eva/	'Eve (in the Bible)'
/veve/	'to be poor'
/ave/	'a roll of thread'

5.1.1.3 Nasals

5.1.1.3.1 /m/

/m/ is invariably a voiced bilabial nasal.

e.g.

/mai/	'hither'
/mou'a/	'mountain'
/mutu/	'a cut'
/maha/	'four'
/tama+riki/	'child'
/'o'omo/	'clothes (pull-over type)'
/tuu+muu/	'dull (of knife)'
/puromu/	'street'
/kumu/	'to drag'

5.1.1.3.2 /n/

/n/ is invariably a voiced alveolar nasal.

e.g.

/'ani+mara/	'animal'
/vahine/	'woman'
/manu/	'bird'
/tunu/	'to cook'
/'oona/	'he, she, it'
/neki/	'to cook for fiesta'
/noa/	'non-restriction'
/hana/	'sun; day'
/noho/	'to stay'
/niho/	'tooth'
/nehe+nehe/	'pretty, nice'

5.1.1.3.3 /g/

/g/ is invariably a voiced velar nasal.

e.g.

/gahu/	'bark (of dog)'
/gaike/	'dog'
/gera+gera/	'slightly dry'
/gutu/	'mouth'
/gaere/	'sand'
/tagata/	'man'
/haga/	'plural marker'
/katoga/	(in free variation with /ato'a/) 'also'
/katiga/	'food'
/keiga/	'bone'

The nasals /m,n,g/ are responsible for non-phonemic nasalization of the vowels immediately following them ([Ṽ]).

5.1.1.4 Median[7]

5.1.1.4.1 /r/

/r/ is a voiced tip-alveolar median with allophones [Ř; ř; r; r̃] which are distributed as follows:

(a) Before a voiceless vowel ([V̲]) (v. 5.1.2.1.3), a voiceless tip-alveolar flap ([Ř]) occurs.

e.g.

/arero̲#/	'tongue'
/rouru̲#/	'hair'
/viru̲#/	'pretty'

It is accompanied by slight friction and is very much like the English /r/ as in /náytrèyt/ or /tray/ rather than /r/ in /náyt+rèyt/. It is somewhat like a rolled fricative as the Czech rolled fricative, but the friction is not so great.

The voiceless tip-alveolar flap ([Ř]) may also occasionally occur, especially in natural speech, when /r/ is preceded by a voiceless stop plus a devoiced unstressed vowel.

e.g.

/ti̲raa+raa/	(the first /r/) 'however'
/pi̲rau/	'pus'

(b) Before a sequence of two identical vowels bearing phrase stress (v. § 6.3.4) a voiced tip-alveolar trill ([r̃]) occurs.

e.g.

/tiraa+raa/	(the second /r/) 'however'
/'aore+raa/	'or else'

(c) Elsewhere, a voiced tip-alveolar median ([r]) and a voiced tip-alveolar flap ([ř]) occur in free variation with a general tendency for the median allophone ([r]) generally to occur after junctures especially after final and non-final junctures, and for the flap allophone ([ř]) to occur inter-vocalically.

e.g.

/ruga/	'on top of'
/roto/	'inside'
/roi+nohi/	'eyeball'
/raiti/	'rice'
/repo/	'dirt'
/'aore/	'no, not'
/fara+oa/	'flour'
/fare/	'house'
/paru/	'fish'
/toreu/	'big'

5.1.2 Vowels

5.1.2.1 General Non-Phonemic Modifications of Vowels

Vowels receive several non-phonemic modifications, namely:

a) nasalization after nasals /m,n,g/

b) breathiness after the voiced allophones of /h/

c) devoicing before a final juncture /#/

d) laryngealization after the glottal stop /'/

e) semi-vocalization and on-gliding

No pair of otherwise segmentally identical sequences of phonemes contrast in terms of any of these modifications. Also all of these modified vowels, which usually occur in faster deliberate speech and in natural speech, are in free variation with their non-modified counterparts. These modifications tend to disappear in slower deliberate speech. For these reasons, these modifications are all non-phonemic, and are not marked in regular phonemic writing.

Although not normally marked in phonemic writing, nasalized, breathy, devoiced and laryngealized vowels are marked respectively by [$\tilde{V}$, $\underset{+}{V}$, $\underline{V}$, $\overset{?}{V}$] in the phonemic presentation of examples in this section.

Breathiness of vowels, as well as devoicing, is not evident in slow deliberate speech, since the voiced allophones of /h/ with which breathiness is associated, for example, occurs only in the fast speech styles. On the other hand, vowel nasalization and laryngealization are independent of the style of speech.

Certain vowels in vowel clusters are semi-vocalized. This semi-vocalization of certain vowels will be explained in detail in § 6.3.3.2.3. Like devoicing mentioned above, this semi-vocalization is also a feature of fast styles of speech. Thus, the devoiced and semi-vocalized vowels are special allophones of respective vowel phonemes occurring only in faster deliberate speech and in natural speech. Phonemically, they are assigned to their non-devoiced and non-semi-vocalized vowel phonemes, respectively.[8]

An important point to remember about these semi-vocalized and devoiced allophones occurring only in fast styles of speech is that they do not behave as full vowels and that they do not count when predicting the occurrence of non-phonemic primary stress.

On-glides of [y], [w], /'/ (glottal stop) and probably also /r/ are explained in § 7.3.

5.1.2.1.1 Nasalization ([$\tilde{V}$])

Vowels are invariably nasalized after the voiced velar nasal /g/ and also occasionally after the bilabial and alveolar nasals /m/ and /n/. The back position of /g/ appears to allow more readily for nasalization of vowels than the front articulation of /m/ and /n/.

Occasionally, more than one vowel is nasalized after a nasal, especially when a rising vowel cluster follows. (v. § 6.3.3.2.3. for the definition of a rising vowel cluster.)

e.g.

/mãĩ/	'hither'
/nõã/	'non-restriction'
/igõã/	'name'

Vowels may be slightly nasalized after /m/ and /n/.

e.g.

/mãgõ/	'shark'
/mõtu/	'atoll'
/mẽa/	'thing'
/nõhi/	'eye'
/nĩho/	'tooth'
/nõa/	'non-restriction'

Vowels are invariably and definitely nasalized after /g/.

e.g.

/papa+rigã/	'cheek'
/tagã/	'chin'
/rugã/	'on top of'
/tarigã/	'ear'
/gũtu/	'lips'
/gãro/	'disappeared'
/haugã/	'smell'

Vowels before nasals, especially before /g/, are also occasionally nasalized.

e.g.

/tarĩgã/	'ear'

5.1.2.1.2 Breathiness ([V̯])

After the voiced pharyngealized allophones of /h/, vowels are breathy.

e.g.

/tahe̯/	'to run, flow'
/niho̯/	'tooth'
/hauga/	'smell'

The breathiness may be heard over more than one following vowel and occasionally even over /r/, especially when there is another voiced pharyngealized /h/ following, not far removed from the first one.[9]

e.g.

/ // i+to'oe+huru+huru+nohi̯ # / 'on your eyelash'

Unlike the other non-phonemic vowel modifications, the breathiness of vowels is associated with changes in vowel height (v. § 5.1.2.3).

When breathy after the voiced pharyngealized allophones of /h/, the high vowels /i/ and /u/ are invariably lowered by one notch ([i̯] and [u̯]) from the norm ([i] and [u], respectively).

e.g.

/tahi̯to/	'old, ancient'
/nohi̯/	'eye'
/huru+huru/	'hair'

In the same environment, the mild vowel /e/ is a lax vowel rather than a tense vowel and slightly lowered ([e̞]) than the norm ([e]).

e.g.

/tahe̞/ 'to run, flow'

/ithe̞a/ 'where (past position)?'

The low vowels /a/ and /o/ after voiced /h/ remain low ([ɑ̞] and [o̞]) and their unstressed allophones are not raised to lower-mid and mid positions, as they are in other unstressed positions ([ə] and [o]).[10]

e.g.

/aha̞/ (the second /a/) 'what?'

/noho̞/ (the second /o/) 'to sit down, stay, dwell'

5.1.2.1.3 Devoicing ([V̥])

Before junctures (i.e. before final, non-final and plus junctures, in order of decreasing frequency), vowels may be devocalized.

e.g.

/#tooku+rouru̥#/ 'my hair'

/#tooku+pepenu̥#/ 'my head'

/#' aore+koe#e+hauga+fa'a+hou+anḁ#/ 'you cannot smell any more.'

/#ua+piri̥// to'oe+ihu#/ 'Your nostrils are clogged.'

/#ua+motu̥// to'oe+gutu̥#/ 'Your lips are cut.'

/#ua+garo/to'oe+arero#/ 'Your tongue has disappeared.'

/#e+tariga+turi+to'oe#/ 'Are you deaf?'

Another environment, in which a vowel may be occasionally devoiced, has already been mentioned in the second half of environment (a) in § 5.1.1.4.1.

Contrary to my expectation after reading the descriptions of other Polynesian languages, however, the devoicing before junctures does not occur very frequently in deliberate speech in Tuamotuan, devoicing presumably being a feature of natural speech.

5.1.2.1.4 Laryngealization ([V̊ˀ])

After the glottal stop /'/, what I call laryngealized vowel occurs.

e.g.

/to'o̊ˀe/	'your (intrinsic possession)'
/ha'åˀe/	'spit'
/ma'o̊ˀ/	(in free variation with /mago/) 'shark'
/ra'i̊ˀ/	(in free variation with /ragi/) 'sky'

More than one vowel immediately following the glottal stop /'/ and / or a vowel preceding a glottal stop /'/ may also be laryngealized.

e.g.

/ //i+to̊ˀ'o̊ˀe̊ˀ+rae#/ 'on your forehead'

(v. § 5.1.1.1.4)

5.1.2.2 Description of Each Vowel Phoneme

5.1.2.2.1 /i/

/i/ is a high front unrounded vowel with allophones [i, ɨ], which are distributed as follows:

(a) When unstressed (and also when breathy, stressed or unstressed, as was discussed in § 5.1.2.1.2), a lower-high front unrounded allophone ([ɨ]) occurs.

e.g.

/pahoki/	'perhaps'
/kai/	'to eat'
/vai/	'who'
/mai+ta'i/	'good'
/koi/	'sharp (of knife)'
/igoa/	'name'
/i+roto/	'in'

When followed by an identical vowel and when stressed, a high front unrounded vowel ([i]) occurs.

e.g.

/kaa+kii/	'neck'
/tii+tii/	'breast'
/torire/	'to float'
/tariga/	'ear'
/matie/	'grass; green'
/ihu/	'nose'
/ito+ito/	'courageous'
/viru/	'to be able to'

5.1.2.2.2 /e/

/e/ is a mid front unrounded vowel, with allophones [ɛ ; e; eˇ] which are distributed as follows:

(a) After low vowels /a/ and /o/, a lower mid front unrounded vowel ([ɛ]) occurs.

e.g.

/to'oe/	'your (intrinsic possession)'
/koe/	'you'
/ha'ae/	'spit'
/rae/	'forehead'
/tae/	'to arrive'
/pae/	'side'

(b) When unstressed (and also when breathy, stressed or unstressed, as was discussed in § 5.1.2.1.2), /e/ is lax, rather than tense, and is also slightly lower than when stressed ([eˇ]).

e.g.

/vahine/	'woman'
/gaike/	'dog'
/teraa/	'that'
/roe+roe/	'belly, guts'
/keiga/	'bones'
/teina/	'younger sibling of the same sex'

In the above-mentioned environment, however, /e/ is never as low as the first allophone of /e/, i.e. a lower-mid front unrounded [ɛ].

(c) When followed by an identical vowel and when stressed, a mid-front unrounded vowel ([e]) occurs.

e.g.

/kee/	'different, original'
/'ee/	'yes'
/rehu/	'ashes'
/mea/	'thing'
/haere/	'to go'
/nehi/	'to cook for fiesta'
/heva/	'cry aloud'

5.1.2.2.3 /a/

/a/ is a low central unrounded vowel, with allophones [æ; ɑ; ʌ; ə] which are distributed as follows:

(a) Before /e/, a low front unrounded vowel occurs ([æ]).

e.g.

/pae/	'side'
/tae/	'to arrive'
/rae/	'forehead'

In slower deliberate speech, this allophone is centralized and a low central unrounded vowel ([ʌ]) occurs.

(b) Before (and after) an identical vowel, a lower-low central unrounded vowel ([ɑ]) occurs.

e.g.

/raa+tou/	'they, all'
/maa+ui+ui/	'painful'

/hia(+)atu/[11]	(from /hia+atu/) 'passive + away from speaker'
/heva(+)ana/	(from /heva+ana/) 'to cry aloud + continuously'

(c) When stressed, (and also when breathy, stressed or unstressed, as was discussed in § 5.1.2.1.2), a low central unrounded vowel ([ʌ]) occurs.

e.g.

/'api/	'page'
/ani/	'to ask (a question)'
/ati/	'trouble'
/'a'ahi/	'a variety of fish'
/aho/	'to breathe; breath'
/aro/	'front, face'
/ato/	'to thatch a house'
/ano/	'distant'

(d) When unstressed, a lower-mid central unrounded vowel ([ə]) occurs.

e.g.

/ua/	'perfective'
/mea/	'thing'
/toa/	'store'
/ura/	'to burn with flame'
/gera+gera/	'dry'
/teina/	'younger sibling of the same sex'
/heva/	'to cry'
/higa/	'to die'

5.1.2.2.4 /u/

/u/ is a high back rounded vowel, with allophones [u, ʊ], which are distributed as follows:

(a) When unstressed (and also when breathy, stressed or unstressed, as was discussed in § 5.1.2.1.2), a lower-high back rounded vowel ([ʊ]) occurs.

e.g.

/atu/	'away from speaker'
/motu/	'atoll'
/manu/	'bird'
/tapu/	'a man's name'
/toru/	'three'

(b) When followed by an identical vowel and when stressed, a high back rounded vowel ([u]) occurs.

e.g.

/tuu+muu/	'dull (of knife, scissors)'
/tapuu/	'private'
/taa+puu/	'to cut, divide'
/uu/	'milk'
/paa+puu/	'certain, sure'
/tuu+tagi/	'to cry aloud'
/'uri+ta'ata/	'monkey'
/ura/	'to burn with flame'
/ruki/	'evening, night'
/ruga/	'on top of'
/karuri/	'left'

/kui+kui/	'thin'
/ha'uti/	'to play'

5.1.2.2.5 /o/

/o/ is a low back rounded vowel, with allophones [o , ɔ] which are distributed as below.

(a) When followed by an identical vowel and when unstressed, a mid back rounded vowel ([o]), occurs.

e.g.

/'oona/	'he, she, it'
/noo+hea/	'from where?'
/toona/	'his, her, its (intrinsic possession)'
/i+koo/	'over there, thither'
/hoo+pere/	'throw away'
/fato/	'wrestling'
/touo/	'egg'
/piko/	'to sleep'
/o+vai/	'who?'
/'ovaho/	'terrible'
/arero/	'tongue'

(b) Before /e/, when stressed (and also when breathy, stressed or unstressed, as was discussed in § 5.1.2.1.2), a low back rounded vowel ([ɔ]) occurs.

e.g.

/to'e+to'e/	'cold'
/roa/	'long'
/'aore/	'not, no'

/koe/	'you'
/motu/	'atoll'
/hoe/	'paddle'
/nohi/	'eye'
/roe+roe/	'belly'
/oti/	'to finish'
/'ori/	'dance'
/oge/	'hunger'

5.1.2.3 A Summary: A Chart of Vowel Phonemes and their Allophones.

Given in a traditional phonetic chart on the following page is an exhaustive list of Tuamotuan phones discussed as allophones of Tuamotuan vowel phonemes in § 5.1.2.2.

All the allophones of Tuamotuan vowel phonemes /i,e,a,u,o/ and their environments may be conveniently recapitulated as follows:

(a) /i/

[i]	(1) in a long vowel
	(2) when stressed
[ɨ]	(1) when breathy, stressed or unstressed
	(2) when unstressed

(b) /e/

[e]	(1) in a long vowel
	(2) when stressed

TABLE 2

ALLOPHONES OF TUAMOTUAN VOWEL PHONEMES

	front unrounded	central unrounded	back rounded
high	/i/ [i]		/u/ [u]
12 lower-high	[ɨ]		[ʊ]
mid	/e/ [e] [eˇ]		[o]
lower-mid	[ɛ]	[ə]	
low	[æ]	/a/ [ʌ]	/o/ [ɔ]
lower-low		[ɑ]	

	[e]	(1) when breathy, stressed or unstressed
		(2) unstressed
	[ ]	after the low vowels /a/ and /o/
(c)	/a/ [ ]	before the mid vowel /e/

	[ə]	when unstressed
	[ʌ]	(1) when breathy, stressed or unstressed
		(2) when stressed
	[ɑ]	in a long vowel
(d)	/u/	
	[u]	(1) in a long vowel
		(2) when stressed
	[ʊ]	(1) when breathy, stressed or unstressed
		(2) when unstressed
(e)	/o/	
	[o]	(1) in a long vowel
		(2) when unstressed
	[ɔ]	(1) when breathy, stressed or unstressed
		(2) when stressed
		(3) before the mid vowel /e/

5.2 Frequency of Segmental Phonemes

The relative frequencies of the segmental phonemes in Tuamotuan were calculated from the same text of 2,582 phonemes given in Chapter IX. Foreign place names and personal names such as 'Honolulu' and 'Victorine', which are indicated by single quotation marks in the English translation on the right-hand side, were excluded from consideration. A long vowel was counted as two short vowels.

Single phonemes expressed absolutely and as a percentage of the total number of phonemes are:

/p/	54	2.0%
/t/	180	6.9%
/k/	107	4.1%
/'/	101	3.9%
/f/	13	0.5%
/h/	140	5.4%
/v/	19	0.7%
/m/	65	2.5%
/n/	84	3.2%
/g/	39	1.5%
/r/	153	5.9%
/i/	280	10.7%
/e/	378	14.6%
/a/	611	24.4%
/u/	103	4.0%
/o/	255	10.2%

A total of 90 long vowels occurred (including those resulting from loss of plus juncture), which means that 5.5% of vowel phonemes occur in long vowels. Each long vowel expressed absolutely is: /aa/ 48; /ee/ 13; /ii/ 7; /oo/ 19; and /uu/ 3.

The data on single segmental phonemes may be summarized by noting the frequency of occurrence of each type of phoneme:

vowels	62.9%
consonants	36.9%

Consonant phonemes classified according to their manner of articulation, expressed both absolutely and as a percentage of the total number of phonemes are:

stops	341	13.2%
fricatives	172	6.6%
nasals	188	7.2%
liquids	153	5.9%

Consonants classified according to their points of articulation both absolutely and as a percentage of the total number of phonemes are:

labials	151	5.8%
alveolars	417	16.1%
velars	146	5.6%
glottals	241	9.3%

Voiceless and voiced consonants expressed both absolutely and as a percentage of the total number of phonemes are:

voiceless consonants	595	23.0%
voiced consonants	360	13.9%

These figures show that vowels account for over 60% of all the segmental phonemes in Tuamotuan with /a/ accounting for over 45% of the vowels. Alveolars account for 45% of the consonants.

NOTES

[1]Phonetic transcriptions given in this thesis, such as those given in § 6.2.2, have been taken from actual field notes. When a given example has been articulated more than once by my informant(s), a phonetic transcription of the most frequent or the most typical articulation has been given. An allophone of a phoneme given in this section also indicates the most frequent or the most typical articulation of a given phoneme in a given environment.

[2]A semicolon indicates a borderline between two different environments. All the phones given between any two semicolons are thus allophones occurring in the same environment.

[3]Tuamotuan /p/ and /t/ are frequently spelled with B and D respectively in current Tuamotuan orthography. This compares with such spelling of Polynesian loans in current English as "tabu/taboo" and "Bora Bora" which are phonemically /tapuu/ and /pora+pora/ in Tuamotuan as well as in Tahitian.

The Tuamotuan /p,t/, as well as Tahitian /p,t/, are UNaspirated, whereas /p/ as in /tapuu/ and /pora+pora/ is usually UNaspirated.

Along with many other authors of phonetics textbooks, Smalley (1964, p. 388) states that ". . . many speakers of

English do not regularly voice /b,d,g/ but normally have voiceless UNaspirated stops for these phonemes, at least in many positions."

It was British explorers such as Wallis in 1767, and Cook in 1769, 1772, and 1773, who discovered Tahiti and were in Tahiti during its initial years of contact with Europeans. Cook, for example, was the first European to visit the Island of Bora Bora in 1769. (v. Pacific Islands Year Book, 1963, p. 154). In the early 19th century the Bible was first translated into Tahitian by missionaries of the London Missionary Society. Tahitian long has been lingua franca of the whole of French Polynesia, including Tuamotuans.

Being British, the first missionaries or explorers who invented the English spelling of "tabu/taboo" and "Bora Bora" for Tahitian-Tuamotuan /tapuu/ and /pora+pora/ respectively, took the Tahitian unaspirated /p/ for their /b/, i.e. heard it as identical with English /b/ as is often the case when native speakers of English hear unaspirated /p,t,k/'s in many languages other than English, as explained by Smalley.

[4]In Tahitian, the frequency of occurrence of the glottal stop /'/ is higher than in Tuamotuan. An impressionistic statement I was tempted to make upon our arrival in Tahiti was that speakers of Tahitian were

constantly choking themselves when they spoke Tahitian and that Tahitian was VERY ARABIC.

[5]According to Marguerite White, people from the atoll of Reao in the Tuamotuan Archipelago do not have the glottal stop /'/ at all in their speech.

[6]In the articulation of /i/ the tongue moves rapidly front and upwards from the central low position for /a/ or from the back position of /u/ or /o/, and travels the longest distance in the mouth in a very short time. Moreover the tip-blade part of the tongue is suddenly tightened for the articulation of /i/. For these reasons, it is considered in terms of Tuamotuan phonetics that no articulatory energy or at least no energy for any genuine constriction in the pharyngeal area remains. Thus the acoustic impression is merely a general brief feature of voicing.

[7]For a definition of a median, see Gleason (1955: p. 252).

[8]For exact phonetic characteristics of a semi-vocalized vowel, see note no. 9 for Chapter VI.

[9]/r/ is a vocoid from the phonetic viewpoint and can thus be breathy in spite of the fact that it is structurally a consonant in this language.

[10]In the articulation of the voiced allophones of /h/ (v. § 5.1.1.2.2) there is a considerable degree of

constriction in the pharyngeal area. It is suspected that due to the articulatory energy concentrated in the pharyngeal area the tongue does not hit the normal position for each vowel (and just stays there, as in vomiting when there remains nothing in particular to vomit.)

[11]Plus juncture in parentheses stands for dropped plus juncture which is one of the most striking features of Tuamotuan morphophonemics. Plus juncture bordered by two identical vowels is invariably lost and the identical vowels behave as a single long vowel just like any other long vowel. Non-phonemic primary stress also occurs on the sequence of two identical vowels which is a result of loss of plus juncture bordered by two identical vowels.

[12]Phones on both sides of a dotted line are allophones of the same phoneme. A black line indicates a borderline between two different phonemes.

CHAPTER VI

SUPRASEGMENTAL PHONEMES

6.1 Suprasegmental Phonemes

The following suprasegmental phonemes are distinguished: (a) four junctural phonemes, namely, final, non-final, plus juncture, and hesitation (/#, // , +, .../); (v. § 6.2) (b) one suprasegmental phoneme, namely phrase stress (/∨/; v. § 6.3).

6.2 Junctural Phonemes

Phonetic "phenomena relating to the way in which sounds are joined together are summarized under the term JUNCTURE" (v. Bloch-Trager (1942: 35 (3))). Any definition of juncture in terms of grammatical border point or in terms of a morpheme division (v. Hamp (1957: 36-37)) is a typical example of a mixing of levels, at least to my mind, and juncture should be first defined in terms of phonology, as is done in Trager-Smith (1951) and Biggs (1961).

Of the four junctural phonemes, only hesitation (/.../), of which occurrence is not at all predictable, may not occur over a long sequence of segmental phonemes or not at all in some discourses. The domain of a sequence of segmental phonemes that may occur without any of the other three junctural phonemes, namely final, non-final and plus junctures (/#, //, +/), is limited as follows.

In the following examples, [=] is not a new phoneme, but is a special symbol which stands for any of the three junctural phonemes of final, non-final and plus juncture. (/#, // , +/).

The minimum of a short single vowel (/ =V= /) may occur bordered by junctural phonemes,

e.g.

/ =a= / 'imperative verbal particle'

/ =i= / 'complement marker'

as in:

/ a+kai+pahoki // i+te+katiga# /

'Eat the food.'

and:

/ =o= / 'focus marker'

/ =e= / 'and'

as in:

/ o+vau // e+koe# /

'I and you'

A maximum of three vowels, two of which may be identical, and one, two or all of which may be preceded by a consonant, (/ =(C)V(C)V(C)V= /), can occur between any two junctures. (v. § 6.3.3.1).

6.2.1 Final and non-final junctures

The final and non-final junctures /#, // / are marked phonetically by the directions of contours of pitch and are

phonemes that are distinct from the pitches (v. Trager-Smith (1956: 1.72 para. 10)), as shown in the following examples.

The final juncture (/#/) has only one allophone of terminal fall (from the previously marked pitch level). The non-final juncture (/ ///) has two allophones: terminal suspension (from the previously marked pitch level) ([··]), and terminal rise (from the previously marked pitch level) ([$^{+}$]). Although not normally marked in regular phonemic writing, the allophones of final and non-final junctures [$^{-}$], [··], [$^{+}$] and pitches [$_1$], [$_2$], [$_3$], [$_4$], and [$_5$], are marked over the phonemic presentation of examples in this section.

/ $^{-}{}_{2}$ma$_{3}$ki$^{+}{}_{2}$ma$_{3}$ki$^{\cdot\cdot}{}_{4}$ma$_{1}$ki^{-} / 'sick, sick, sick'

/ $^{-}{}_{2}$raa+$_{3}$kau$^{+}{}_{2}$raa+$_{3}$kau$^{\cdot\cdot}{}_{4}$raa+$_{1}$kau^{-} / 'tree, tree, tree'

The above examples are the forms given by an informant when asked for the Tuamotuan words for 'sick' and 'tree' and also asked to pronounce them three times in succession.

Terminal rise ([$^{+}$]) and terminal suspension ([··]), which do not contrast with each other, mean 'continuity of utterance'. Terminal fall ([$^{-}$]) occurs only at utterance-final position and means '(temporary) discontinuity of utterance', implying a potential beginning of another utterance. Thus two phonemes of non-final juncture (/ ///) and final juncture (/#/) are established, the former

having two allophones of terminal rise ([$^{+}$]) and terminal suspension ([··]), the latter having one phonetic representation of terminal fall ([$^{-}$]). They are phonemes contrasting with each other and are, at the same time, (suprasegmental) morphemes with the above-mentioned meanings.

We can now define phonological sentence as an utterance bordered by two final junctures, and a phonological phrase as that part of an utterance bordered by final and/or non-final junctures.

Phonetic characteristics of non-final juncture (/ ///) are:

(1) brief pause,

(2) high preceding pitch,

(3) sustained loudness,

(4) rapid decrescendo to pause, and

(5) final vowel before this juncture still voiced in a majority of cases.

A Tuamotuan sentence (i.e. an utterance bordered by final junctures) typically starts out on a low or middle pitch level of [$_2$] (or [$_3$]). It may go up in terms of pitch level toward an occurrence of non-final juncture (/ ///), as in:

/ $^{-}{}_{3}$ua+$_4$motu$^{+}{}_{3}$tooku+'a$_4$vae$^{+}{}_{2}$i+te+$_3$ti$_1$pi^{-} /

'The foot was cut by a knife'.

In this case, the allophone of non-final juncture that occurs is typically the terminal rise ([$^{+}$]).

Alternatively, sentence may rise and fall in pitch toward an occurrence of non-final juncture (/ // /), as in:

/$^{-}{}_{2}$a+$_{3}$hi$_{2}$pa+mai+nei··$_{2}$tooku+$_{3}$ko$_{1}$ta^{-}/

'Look at my tumour.'

/$^{-}{}_{2}$mea+to$_{3}$re$_{2}$u··$_{2}$teie+pi$_{3}$ra$_{1}$u^{-}/

'There is a lot of pus.'

In this case, the terminal suspension allophone ([··]) occurs. Thus terminal rise ([$^{+}$]) and terminal suspension ([··]) are in complementary distribution, the determining factor being the preceding pitch contour; it may first rise, fall, and rise again toward an occurrence of non-final juncture (/ // /), as in:

/$^{-}{}_{3}$ua+pa$_{4}$hu$_{3}$re+$_{4}$roa$^{+}{}_{2}$tooku+poro+$_{3}$ri$_{1}$ma^{-}/

'My elbow has been scratched.'

/$^{-}{}_{2}$to$_{3}$'oe+$_{2}$no$_{4}$hi$^{+}{}_{2}$e+$_{3}$au+$_{2}$i+too+te+$_{4}$ma$_{1}$'o^{-}/

'Your eyes look like those of a shark.'

As may be seen from the above example, it is terminal rise ([$^{+}$]) which occurs in this environment.

Pitch contours are more or less in accordance with the stress pattern explained in detail in § 6.3. In Tuamotuan, phonetic stress (i.e. non-phonemic primary stress discussed later) occurs predictably on a penultimate vowel counting back from any juncture. Phrase stress, which is phonemic because its occurrence is not always predictable, occurs on the last phonetic stress available within a

phonological phrase in a great majority of cases. It is observed that vowels which receive stress, including both phonetic stress and phonemic phrase stress, are of higher pitch levels than their neighboring vowels.

Occasionally a Tuamotuan sentence may begin with a higher pitch level of $[_4]$ or $[_5]$ (especially when a sentence begins with a question word such as /aha/ 'what?'), as in:

/$^{-}{}_5$e+aha$^{\cdot\cdot}{}_2$to$_3$'oe+$_2$he$_4$va(+)a$_1$na^{-} /

'Why are you crying?' (Lit. 'What is your continued crying?').

in which case, the terminal suspension allophone ([··]) of non-final juncture occurs due to the fact that it is difficult to use the terminal rise allophone ([+]) in this environment.

The pitch level before non-final juncture is never as low as $[_1]$, either before terminal rise ([+]), or before terminal suspension ([··]).

In the case of terminal rise ([+]), which occurs far more frequently than terminal suspension ([··]), the ultimate vowel may occasionally sound almost as loud as the stressed penultimate vowel carrying the phrase stress. (v. § 6.3.4.)

Phonetic characteristics of final juncture /#/ are:

(1) pause,

(2) decreasing loudness,

(3) falling pitch,

(4) occasional devoicing of vowels, and

(5) non-phonemic shortening of vowels immediately before final juncture (/#/).

Unlike Maori and Nukuoro, vowels which follow /r/ may also be devocalized in Tuamotuan, in which case /r/ also becomes devocalized and a voiceless tip-alveolar flap accompanied by slight friction ([Ř]) occurs (v. Biggs (1961: 11) and Carroll (1965: 199)).

A phonological phrase ending in final juncture (/#/) typically starts out with a lower pitch of $[_2]$ or $[_3]$ just like a phrase ending in non-final juncture (/ // /). It is characterized by a sudden rise to a higher pitch of $[_3]$ or $[_4]$ respectively, and a subsequent abrupt drop to the lowest pitch of $[_1]$ toward terminal fall ([¯]), as was exemplified in the examples already given in this section.

A phonological phrase before final juncture /#/ may have more than one peak of high pitch as in the last example given, which is also true of a phonological phrase before non-final juncture (/ // /). The last peak is higher in its pitch level than any preceding peaks, however, and is always followed by a sudden fall to $[_1]$ immediately before terminal fall ([¯]) followed by complete silence.

6.2.2 Plus Juncture

Plus juncture (/+/) marks open transition between two segmental phonemes, and is in phonemic contrast with

close transition. It occurs at a point of possible pause which may or may not be actualized.

Examples of contrast are:

/tama+iti/	'child'
/mai+ta'i/	'good'
/faka+ea/	'to breathe'
/kaefa/	'husband'
/fare+iti/	'toilet (lit. 'small house')
/reira/	'aforementioned place"

The phonetic basis for the contrast of close and open transitions between vowels is as follows.

Typically the articulation of a vowel followed by another vowel in close transition is somewhat modified toward the articulation of the following vowel. In /ae/ as in:

/pae/	[p̪ ǽ ɛ]	'five'
/tae/	[t̪ ǽ ɛ]	'to arrive'
/kaefa/	[k̟ʰʌ · ɛ́ f ə] ~ [k̟ʰæ ɛ́ f ə]	'husband'

for example, /a/ is typically a low front unrounded vowel ([æ]) and is front rather than central as compared, for example, with /a/ ([ʌ] when stressed and [ə] when unstressed) of:

/'api/	[ʔ ʌ́ p̟ʰ i]	'page'
/ata/	[ʌ́ t̟ʰ ə]	'cloud'
/ura/	[ŭ ř ə]	'to burn with flame'
/higa/	[h i̋ ŋ ə̃]	'to die'

(v. § 5.1.2.2.3 (a) and 5.1.2.3.)

Similarly, the second of two vowels in close transition is usually modified somewhat toward the point of articulation of the preceding vowel. Thus /e/ as in /p<u>ae</u>/, /t<u>ae</u>/ and /k<u>ae</u>fa/ is typically a lower-mid unrounded vowel ([ɛ]) and is one notch lower and lax, as compared, for example, with /e/ ([e] when stressed and [eˇ] when unstressed), as in:

/vahine/	[vəhɨ̞nẽ]	'woman'
/gaike/	[ŋə̃íkʰeˇ]	'dog'
/rehu/	[réhʉ̞]	'ashes'
/mea/	[mẽə]	'thing'

(v. § 5.1.2.2.2.(a) and § 5.1.2.3.).

Vowels in open transition, on the other hand, do not affect each other in this manner, thus making for audible phonetic differences between underlined segments of phonemes, as in:

/tam<u>a+i</u>ti/	vs.	/m<u>ai</u>+ta'i/
/fak<u>a+e</u>a/	vs.	/k<u>ae</u>fa/
/far<u>e+i</u>ti/	vs.	/r<u>ei</u>ra/

for example.

In the articulation of /faka+ea/ in slower deliberate speech, there is also a perceptible interruption or delay in the manner of transition from /a/ to /e/. According to the tradition of American structural linguistics, this interruption or delay is interpreted as plus juncture, symbolized /+/ in this thesis.

Identical vowels in open transition are characterized by re-articulation of the second vowel. Identical vowels in close transition on the other hand, are not separated by any break.

e.g.

/te+haga+ata/ [ʈʰeˇ .hʌ́ŋə̃.ʌ́ ʈʰə][1] 'clouds'

/'aa+pii/ [ʔ ɑ́:.pí:] 'new'

Certain phonetic co-relations between plus juncture and phonetic stress are observed:

observation (a) Plus juncture occurs after an unstressed vowel which is preceded by a stressed vowel, i.e. in the environment V́(C)V̀___;

observation (b) No sequence of unstressed vowels, i.e. * V̀(C)V̀, ever occurs in close transition.

Thus, even when no direct contrasts are available, plus juncture (/+/) is marked in this thesis in the following environments:[2]

(a) after any unstressed vowel preceded by a stressed vowel with or without an intervening consonant, i.e. [V́(C)V̀] /+/. Example: [mʌ̃́ʈʰə] /+/ 'eye'

(b) between any two unstressed vowels, i.e. *[V̀(C)V̀] does not occur in my phonetic transcription of Tuamotuan but only [V̀] /+/ [(C)V̀] occurs. Example: [mʌ̃́ʈʰə] /+/ [ʈʰə ŋʌ̃́ʈʰə] /+/ 'man's eye'

In some styles of speech, a break (symbolized by a lowered dot [.] in the following phonetic presentation) is audible between a vowel and an immediately following consonant, as in:

/pae+pae/	[p̪ǽɛ.p̪ǽɛ]	'side'
/kara+poga/	[k̪ʌ́řə .p̪ɔ́ŋə̃]	'throat'

This break is not perceived as a pause but is characterized by:

(1) a very brief decrescendo of articulatory energy over the preceding vowel,

(2) a slight prolongation of the preceding vowel, and

(3) an increase of energy in the articulation of the following consonant.[3]

The marking of plus juncture as a phoneme between a vowel and a consonant receives phonetic support on the basis of the above-mentioned phonetic characteristics.

The break is not always audible, especially in faster deliberate speech and in natural speech. Furthermore, /pae+pae/ does not contrast with */paepae/, for example. Plus juncture (/+/) is nevertheless marked between the first /pae/ and the second /pae/, partly because the first /pae/ corresponds to environment (a) stated already. This is done because otherwise not only plus juncture, which has been established as a phoneme already, but also phonetic stress (marked by [´] in the above examples for demonstrative convenience) would also have to be marked as a phoneme

(i.e. */ ´ /). (v. § 6.3.3).[4]

Use of both plus juncture and phonetic stress in phonemic writing of Tuamotuan would be redundant when a contrast in terms of plus juncture is also available, as in:

*/fáre+íti/ 'toilet'

*/reíra/ 'aforementioned place'

which were also given earlier. Thus it appears it is reasonable to establish only plus juncture as a phoneme, because phonetic stress can then be made predictable by means of plus juncture now established as a phoneme.

Plus juncture is also marked after any long vowel (i.e. a sequence of two identical vowels in close transition) immediately followed by a consonant on the basis of the following phonetic fact noted in slower deliberate speech.

It is an easily observable fact about Tuamotuan faster deliberate speech and natural speech that the second member of a long vowel is never re-articulated and that the first member vowel invariably receives phonetic stress which is carried over to the second member vowel due to the non-re-articulation of the second member.

Given below, however, are typical articulations of long vowels in slower deliberate speech in which the second member of a long vowel is not especially re-articulated and is not stressed. Furthermore, it is lax as compared with the tense first member and is also centralized.

/#noo+hea#/	[ˉ $_3$n$\acute{\tilde{ɔ}}$ $_2$ɔˆ $_4$h$\acute{e}$ $_1$ə ˉ]	'from where?'
/#naa+hea#/	[ˉ $_3$n$\acute{\tilde{ʌ}}$ $_2$ʌˆ $_4$h$\acute{e}$ $_1$ə ˉ]	'how?'
/#kaa+kii#/	[ˉ $_{2\shortparallel}$k$\acute{ʌ}$ʌˆ $_3$k$\acute{i}$ $_1$i$_{\wr}$ˇ ˉ]	'neck'
/#kee+roa#/	[ˉ $_3$k$\acute{e}$e$_{\wr}$ˇ $_1$r$\acute{ɔ}$ə ˉ]	'really original'
/#taa+puu#/	[ˉ $_{2\shortparallel}$t$\acute{ʌ}$$_{\wr}$ˆ $_3$p$\acute{u}$ $_1$u$_{\wr}$ˇ ˉ]	'to divide'

Thus a long vowel actually corresponds to environment (a) given earlier. For this reason, it seems valid to mark phonemic plus juncture (/+/) after the second member of any long vowel at all times.

6.2.3 Hesitation

Hesitation (/.../) is the junctural phoneme whose phonetic realization is:

(1) over-prolongation of a preceding (vowel) phoneme, and/or

(2) pause.

As in English, an immediately preceding vowel may be centralized in hesitation when it is over-prolonged. Hesitation is in phonemic contrast with open transition or plus juncture (/+/), as in:

/#e...hoko+mai+raa+teu// i+te+haga...haga+haga//noo+te+hopu +haga#/

> 'And...they buy various...things for diving (for mother-of-pearl).'

in which /.../ occurs where plus juncture (/+/) would normally occur.

Having a meaning of its own (i.e. hesitation), it is a phoneme and a morpheme at the same time.

It is a feature of hesitation that a speaker restates part or all of the already stated segment of a phrase before /.../, as in:

/#'oia+hoki// mai+te+taura// te+taa+pau //te...CONTRE-PLAQUÉ // noo+te+haga+haga// i+te...te+haa+veke# //

'In other words, such things as ropes, lead (sinkers), and the -e-e...plywood in order to build a...a canoe.'

As in English, hesitation occurs most frequently after such words as /te/ 'the', /e/ 'and' (preposed minor morpheme) and /e/ 'quotational' (postposed minor morpheme).

Like plus juncture (/+/), hesitation (/.../) is also in phonemic contrast with close transition, as in:

/#ua+reko+hia+i+aa+ku+ee// te+vai+raa//te...// e+aha//

teraa+mea// s...s...s...// mea+haka+heke+pahoki#/

'I understand that there is (in Wakiki) the...what is that thing...s...s...s...the sliding thing?'

in which the speaker, not too well versed in English, is asking the other speaker for the English word 'surf'. Hesitation also occurs when a speaker looks for a native word after articulating the first phoneme or two of the word.

6.3 Phrase Stress

6.3.1 Historical Summary of Stress

There have been few, if any, detailed descriptions of stress in Polynesian languages. A frequent remark is that stress occurs on the penultimate vowel or syllable but PENULTIMATE TO WHAT is seldom made clear and we are not always told how the syllable is to be defined. Nevertheless, there is an element of truth in the traditional view that stress is penultimate in Polynesian, though Maori appears to be an exceptional case.

Biggs (1961: 8) regards primary stress in Maori as phonemic and posits a non-phonemic secondary stress on the long vowel. Phrase stress, called 'contour stress' in Biggs (1961: 8 and 11), is defined together with non-final and final junctures as "...phonemes of a different order, being associated with intonational features and the marking of boundaries rather than with lexical or grammatical content."

Presented in this chapter is a major modification of Biggs' stress theory for New Zealand Maori, which actually is a result of my year-long discussions of stress patterns of Tuamotuan with Dr. Biggs both in Tahiti (i.e. during our fieldwork in the summer of 1967) and at the University of Hawaii (in the academic year 1967-68). Major points of modification are as follows.

(1) Phonetic stress, which is called PRIMARY STRESS and is a phoneme in Biggs (1961: 11), can be made predictable by

"a proper segmentation" (v. White (1965: 518)) of certain sequences of segmental phonemes, i.e. by means of plus juncture (i.e. /+/ discussed in § 6.2.2) as well as final and non-final junctures (discussed in § 6.2.1. in this thesis). Phonetic stress, which is referred to as NON-PHONEMIC PRIMARY STRESS in this thesis, occurs on a penultimate vowel counting back from any of the three junctures mentioned above.

(2) Secondary non-phonemic stress which is mentioned in Biggs (1961: 11), is stated to occur predictably on any long vowel (i.e. a sequence of two identical vowels in close transition) is predictable, NOT BECAUSE it occurs on any long vowel BUT BECAUSE it is necessary to mark plus juncture (/+/) after any long vowel on the basis of certain observable phonetic facts as were stated in § 6.2.2.

(3) The phonetic stress not only in slower deliberate speech but also in natural speech can be made predictable. Stress placement is predictable for all styles of speech by one notation and stress theory.

(4) Phrase stress always occurs at a place where primary stress would normally occur. Consequently, phrase stress is considered to occur as superimposed upon primary stress, this being on the last primary stress available within a phonological phrase in a great majority of cases. When phrase stress occasionally occurs at an unexpected place, it has a meaning of 'contrastive emphasis'. It is thus a

phoneme, although its functional load is relatively light.

A hypothesis that stress, whether phonemic or non-phonemic, occurs on a penultimate vowel or syllable has been mentioned by many other scholars both verbally and in written form for several other Polynesian languages. Thus this phenomenon appears to be more or less pan-Polynesian, at least to a certain degree just as a hypothesis that stress, whether phonemic or non-phonemic, occurs on the initial syllable of nominals appears to be more or less pan-Germanic.

Minor differences among different Polynesian languages are naturally expected and my theory as presented here in this chapter does not claim to be applicable, as it stands, to any other Polynesian languages. The reason is that Tuamotuan is the only Polynesian language I have worked on so far.[5]

6.3.2 Stress in Tuamotuan

In the following discussion, and throughout this thesis, three styles of speech are distinguished, namely, slow deliberate speech, fast deliberate speech and natural speech, as defined in the preface. The placement of stress varies somewhat according to the style of speech, and it has been my aim to account for stress placement in all styles of speech by one notation, and stress theory.

Phonetically, two types of stress occur, (1) phrase stress and (2) primary stress.

Phrase stress is largely predictable. When it is not predictable, it has a meaning of 'contrastive emphasis'. Thus it is both a phoneme and a morpheme (/∨/).[6] Primary stress is predictable and is not phonemic. Although not normally marked in phonemic writing, primary stress is marked by [´] over phonemic presentation of examples in this section.

6.3.3 Primary Stress

6.3.3.1 Primary Stress in Deliberate Speech

In slower deliberate speech, primary stress occurs on the vowel penultimate to any juncture (i.e. final, non-final and plus). (In the following examples, /=/ is not a new phoneme but simply indicates any juncture and thus stands for any of /#, // , +/, i.e. final, non-final and plus junctures, respectively.)

The minimum domain of primary stress is two single vowels, identical or non-identical, either or both of which may be preceded by a consonant, (i.e. /=(C)V(C)V=/).

e.g.

/='ée=/	'yes'
/=áu=/	'I'
/=kée=/	'different, original'
/=méa=/	'thing'

/=átu=/ 'away'

/=gútu=/ 'lips'

The maximum domain of primary stress is three single vowels, one, two or all of which may be preceded by a consonant, (i.e. /=(C)V(C)V́(C)V=/).

e.g.

/=teíe=/ 'this'

/=igóa=/ 'name'

/=aóre=/ 'no, not'

/='oóna=/ 'he'

/=pirau=/ 'pus'

/=tapúu=/ 'private'

/=roúru=/ 'hair'

/=taáku=/ 'my (extrinsic possession)'

/='atáma=/ 'Adam'

/=tagáta=/ 'man'

It follows that in slow deliberate speech, any sequence containing more than three vowels must include more than one primary stress.

e.g.

/=táa+púu=/ 'cut'

/=haére+mái=/ 'come'

/=ráa+káu=/ 'tree'

/=úa+ína=/ 'alcoholic drink'

/=ráa+tóu=/ 'they all'

/=róe+róe=/ 'guts, belly'

/=máa+úi+úi=/	'painful'
/=fára+óa=/	'flour'
/=tíka+híri=/	'blood'
/=túga+áne=/	'the male of two siblings (i.e. a boy's brother or a girl's brother)'
/=kóo+rúa=/	'you two'
/=táa+túa=/	'we two (incl.)'
/=máa+úa=/	'we two (excl.)'
/=ráa+úa=/	'they two'
/=rúur+'áu=/	'old, sage'
/=páu+róa=/	'all'
/='áu+fóu=/	'pay'
/=kóu+tóu=/	'you all'
/=mái+tá'i=/	'good'

/#e+raíti//ta+táa+tóu+katíga//i+teíe+hána#/

'Our food for today is rice.'

The presence or absence of a consonant before any vowel does not count in predicting the occurrence of primary stress, as may be clearly seen from the diagrams given already.

Although the above examples occur with the indicated stress pattern in extremely slow deliberate speech, certain facts in Tuamotuan phonetics necessitate some modifying statements.

The second member of a long vowel (i.e. a sequence of two identical vowels in close transition discussed in

§ 6.2.2 already) is never re-articulated, even in slower deliberate speech. Thus, when either member of a long vowel is stressed, the other member is also stressed. In the examples given already, /='ée=/, /=kée=/, /=táa+púu=/, /=ráa+káu=/, etc. are very rare and are generally articulated as /='éé=/, /=kéé=/, /=táá+púú=/, and /=ráá+káu=/, respectively. In these examples, non-phonemic primary stress is also usually heard on the second member of each long vowel, due to non-re-articulation of the second member.

In /='oóna=/ and /=taáku=/ which were also given already, primary stress occurs on the second member of each long vowel. In this case, primary stress usually begins on the first member of each long vowel, which is also due to the non-re-articulation of the second member of a long vowel. Thus, the most frequent stress patterns are /='óóna=/ instead of /='oóna=/, and /=tááku=/ instead of /=taáku/, respectively, even in deliberate speech.

The only exception occurs when a long vowel occurs immediately before a final juncture, as in /=kée#/ 'different' and /=káá+kíi#/ 'neck', in which case primary stress is not heard over the second member of a long vowel due to the immediately following final juncture (/#/).

To sum up, primary stress occurs on the penultimate vowel of either /=(C)V́(C)V=/ or /=(C)V(C)V́(C)V=/ which are the two typical domains of Tuamotuan primary stress, where V is a short single vowel and each V may be preceded by a

consonant. Vowels receiving no primary stress are UN-stressed.

The only exception occurs when either member of a long vowel is stressed, in which case the other member also becomes stressed, except when the latter occurs immediately before a final juncture /#/.

Of all the UNstressed vowels, the one immediately before final juncture /#/ is the weakest.[7]

Syllables (v. § 7.1 and 7.2) of only a single vowel bordered by junctures such as /=i=/ and /=te=/ are never stressed by definition, the minimum domain of primary stress being /=(C)$\acute{V}$(C)V=/.[8]

6.3.3.2 Primary Stress in Natural Speech

In faster deliberate speech and in natural speech, the following phonetic facts predictably change the stress patterns described in § 6.3.3.1.

(a) Identical vowels across plus juncture (/+/) coalesce into a single long vowel (i.e. a sequence of two identical vowels in close transition), which expands the maximum domain of stress to /=(C)V_1(C)$\acute{V}_2\acute{V}_3$(C)V_4=/ where V_2 and V_3 are identical.

(b) Vowels are occasionally devocalized before final-juncture. Also, certain vowels in vowel clusters are semi-vocalized. These devocalized vowels and semi-vocalized vowels do not count as FULL vowels in predicting the occurrence of primary stress, which still occurs predictably

on a FULL vowel penultimate to any of the three junctures, i.e. final, non-final and plus junctures.

These devoiced and semi-vocalized vowels are allophones of their respective vowel phonemes which occur only in faster deliberate speech and in natural speech. (v. § 5.1.2.1 (c) and (e).) Thus, phonemically, they are assigned to their non-devoiced and non-semi-vocalized counterparts, respectively.[9]

The ways these phonetic facts about Tuamotuan faster deliberate speech and natural speech affect the stress patterns described in § 6.3.3.1 will be explained with examples in further detail in the following subsections.

6.3.3.2.1 The Maximum Domain of Primary Stress in Natural Speech

Two adjacent identical vowels in open transition (i.e. with an intervening plus juncture (/+/)) coalesce into a long single vowel with both members stressed in faster deliberate speech and natural speech.

e.g.

/=hiá(+)átu=/[10]	(from /=hia+atu=/) 'passive marker (grammatical word)' and 'away from the speaker (grammatical word)'
/=hokí(+)ía=/	(from /=hoki+ia=/) 'also (grammatical word)' plus 'reference (grammatical word)'
/=tugá+áne=/	'the male of two siblings', which

was given in § 6.3.3.1, occurs only in slow deliberate speech and never occurs in faster deliberate speech or in

natural speech. The articulation in the latter styles of speech is invariably /=tugá(+)áne=/.

As may be seen from the three examples given already, the maximum domain of primary stress in natural speech of Tuamotuan is /=(C)V_1(C)$\acute{V}_2\acute{V}_3$(C)V_4=/ where V_2 and V_3 are identical and where V_3 is not preceded by a consonant. In this case, primary stress occurs on both V_2 and V_3. This expanded maximum domain of primary stress in natural speech may be regarded as a special variation of the maximum domain of primary stress for slow deliberate speech, i.e. /=(C)V(C)$\acute{V}$(C)V=/.[11,12]

6.3.3.2.2 Devoicing of Utterance-Final Vowels

The final vowel may be devoiced before a final juncture and especially after a voiceless consonant.

e.g.

the last /a/ in /=tágata#/ 'man'

the last /i/ in /=pákoti#/ 'scissors'

In this case, the penultimate vowel counting back from the devoiced vowel receives the primary stress, <u>if</u> there is a vowel before the preceding juncture. The ultimate vowel of /=máki#/ 'sick', for example, is often devoiced but this does not change the stress pattern, the minimum domain of primary stress being /=(C)$\acute{V}$(C)V=/.

6.3.3.2.3 Vowel Reduction in Vowel Clusters

A RISING VOWEL CLUSTER is defined as a vowel cluster in which the second member vowel is higher than the first member, such as /ai/. A FALLING VOWEL CLUSTER is defined as a vowel cluster in which the second member vowel is lower than the first member, such as /ia/.[13]

Vowel reductions in fast styles of speech of Tuamotuan mainly involve rising vowel clusters. Thus, the second member of a rising vowel cluster is semi-vocalized in a great many cases.

Vowel reduction in fast styles of speech in Tuamotuan may be summarized as follows:

(a) Following the low vowels /a/ and /o/, any vowel is semi-vocalized.

(b) Following the mid vowel /e/, the high vowels /i/ and /u/ are semi-vocalized.

(c) High vowels /i/ and /u/ are semi-vocalized when they PRECEDE each other.

When the high vowels /i/ and /u/ are juxtaposed, as in /iu/ and /ui/, it is the first member that is semi-vocalized.

When the low vowels /a/ and /o/ are juxtaposed, as in /ao/ (phonetically [ʌ́o]) and /oa/ (phonetically [ɔ́ə]), it is the second member that is semi-vocalized.

An implication of these statements is that no vowel reductions take place in falling vowel clusters except when

the first member of a falling vowel cluster is /u/. Thus, /=pápa+hía=/ 'liver', for example, remains /=pápa+hía=/ in fast styles of speech also, and */=papáh^{i}a=/, for example, does not occur.

Semi-vocalization of individual vowels are discussed with illustrations in detail below, according to their heights.

6.3.3.2.3.1 Semi-vocalization of the High Vowels /i/ and /u/

Like the mid vowel /e/ to be discussed next, the high vowels /i/ and /u/ are semi-vocalized when they occur as second members of rising vowel clusters.

e.g.

/=ké^{i}ga=/ (from /=keíga=/) 'bone'

/=pá^{i}mi=/ (from /=paímí=/) 'if'

/=taáto^{u}=/ or more frequently /=tááto^{u}=/

(from /=táa+tóu=/) 'we all (incl.)'

/=raáto^{u}=/ or more frequently /=rááto^{u}=/

(from /=ráa+tóu=/) 'they all'

/=raáka^{u}=/ or more frequently /=rááka^{u}=/

(from /=ráa+káu=/) 'tree'

/u/ is different from /i/ and /e/ in that it is also semi-vocalized when it occurs as a first member of a falling vowel cluster.

e.g.

/=hén^{u}a=/ (from /=henúa=/) 'homeland'

/=taá^{u}a=/ or more frequently /=táá^{u}a=/

(from /=táa+úa=/) 'we two (incl.)

/=raá^{u}a=/ or more frequently /=ráá^{u}a=/

(from /=ráa+úa=/) 'they two'

When /i/ and /u/ which are of the same height, are juxtaposed, it is the first member of each vowel cluster that is semi-vocalized.

e.g.

/=máa+^{u}í^{u}i=/ (from /=máa+úi+úi=/) 'painful'

/=n^{i}ín^{i}u=/ (from /=níu+níu=/) 'wire'

6.3.3.2.3.2 Semi-vocalization of the Mid Vowel /e/

The mid vowel /e/ is semi-vocalized only when it occurs as a second member of a rising vowel cluster.

e.g.

/=há^{e}re=/ (from /=haére=/) 'to go'

/tó'o^{e}=/ (from /=to'óe=/) 'your (intrinsic possession)'

/=vá^{e}va^{e}=/ (from /=váe+váe=/) 'foot'

6.3.3.2.3.3 Semi-vocalization of the Low Vowels /a/ and /o/

The low vowels /a/ and /o/ which are of the same height, are semi-vocalized only when they occur in juxtaposition. Both in /ao/ (phonetically [ʌ́o]) and /oa/ (phonetically [ɔ́ə]), the second member of each vowel cluster is semi-vocalized.

It is important to note that both /ao/ and /oa/ are phonetically rising vowel clusters.

e.g.

/='á^{o}re=/ (from /='aóre=/) 'not'

/=pá^{u}ro^{a}=/ (from /=páu+róa=/) 'all'

6.3.3.2.3.4 Domain of Vowel Reduction

Vowel reduction in vowel clusters may take place in only one of the vowel clusters available within an utterance.

e.g.

/='aúfo^{u}=/ (from /='áu+fóu=/) 'to pay'

/=paúro^{a}=/ (from /=páu+róa=/) 'all'

More frequently, vowel reduction takes place in more than one vowel cluster available within an utterance.

e.g.

/='á^{u}fo^{u}=/ 'to pay'

/=pá^{u}ro^{a}=/ 'all

Occasionally, more than one vowel within a single vowel cluster has been recorded as semi-vocalized.

e.g.

/=^{u}á^{i}na=/ (from /=úa+ína=/) 'alcoholic drink'

[^{w}ʌ́^{y}nə̃]

This is accountable in the following way.

First, /u/ of /=úa+ína=/ is considered to have been semi-vocalized, producing /=^{u}a+ína=/. Secondly, /i/ is considered to have been semi-vocalized, producing the final form:

/=^{u}á^{i}na=/.

Special mention should be made about a non-consonantal characteristic of the glottal stop /'/ in natural speech.

As was mentioned in the description of segmental phonemes, the glottal stop /'/ is not clearly articulated, especially in faster deliberate speech and in natural speech. Its presence in such a case is predicted only by the laryngealization of its neighboring vowels especially those directly following it. The lack of clear-cut articulation of the intervocalic glottal stop /'/ affects the stress pattern also.

e.g. /=má^{i}ta(')^{i}=/ (from /=mái+tá'i=/) 'good, well'

as in: /=méa+mái+tá'i+kóe#/ 'How are you?' (Lit. 'Are you well?')

but /#'ée#méa+má^{i}ta(')^{i}#/ 'Yes, I am fine.'

e.g.

/=fá(')^{a}ho^{u}=/ (from /=fá'a+hóu=/) 'again'

/a'i/ in the above examples is often articulated without a clear-cut articulation of /'/ and approaches /ai/. Since /ai/ is a rising vowel cluster, /i/ in both /=mái+/ and /tá(')i/ is semi-vocalized. Thus the primary stress shifts as far front as /a/ in /=mái+/.

In /=fá'a+hóu=/, /a'a/ is also often articulated without a distinct articulation of /'/ (glottal stop) and approaches /aa/. As will be explained later in detail, a long vowel is occasionally heard as a phonetically short vowel. Thus, a very fast form of /=fá'a+hóu+=/ is

/=fá(')^{a}ho^{u}=/ with primary stress being shifted as far forward as the first /a/.

Vowel reduction obviously takes place for general economy of articulation. From a viewpoint of communication, it seems vowel reduction helps one to convey one's message much faster.

Although the following discussion is basically irrelevant to my stress theory proper, is obviously a good example of mixing levels, and remains an educated guess at best,[14] it seems that a certain kind of structural pressure is also involved in Tuamotuan vowel reductions.

First of all, as was discussed in § 6.3.3.1, the typical domains of Tuamotuan primary stress are /=(C)V́(C)V=/ and /=(C)V(C)V́(C)V=/, where V is a short single vowel and one, two or all V's may be preceded by a consonant. Except for reduplications, many Tuamotuan words are either bi-vocalic or tri-vocalic and have only one primary stress. When a word has more than three vowels, strong structural pressure seems to work toward either of the above-mentioned typical domains of primary stress. When there are any vowel clusters available within such a word, vowel reduction seems to take place most readily.

e.g.

/=fa^{u}tá^{u}(')a=/ (from /=fáu+taú'a=/)
'a place name, i.e. a stadium in Pirae, Papeete, Tahiti, French Polynesia'

As may be seen from previous examples, an important fact about vowel reductions in fast styles of speech in Tuamotuan is that when vowel reductions take place within a word, an intervening plus juncture is frequently cancelled. The higher the frequency of a particular word is, the more frequent is the occurrence of a fast form resulting from vowel reductions discussed in this section.

Not only structural pressure toward the maximum domain of /=(C)V(C)V́(C)V=/ but also structural pressure toward the shorter domain of primary stress (i.e. /=(C)V́(C)V=/) seems to work on a tri-vocalic word. Probably for this reason, a phonemically long vowel is heard as a phonetically short vowel in faster styles of speech.

e.g.

/=tó^{o}ku=/ (from /=toóku=/) 'my (intrinsic possession)'

/=tá^{a}pu^{u}=/ (from /=táa+púu=/) 'to cut'

In utterance-final position under phrase stress which is heavier and louder than primary stress (v. § 6.3.4), this phenomenon never occurs.

e.g.

/=toóku#/ or more frequently /=tóóku#/ 'my'

/=táa+púu#/ or more often /=táá+púu#/ 'to cut'

(v. § 8.2.)

Some cases of partial reduplications in Polynesian languages may also be historically accountable in terms of

vowel reductions presented in this section. In Tuamotuan, at least, /=páe=/ 'side', for example, has two different reduplicated forms of /=papáe=/ and /=páe+páe=/. Both of these two forms have the same meaning and choice is completely dependent upon the individual speaker. It is suspected that the shorter form of /=papáe=/ is a result of a faster form of /=pá^{e}pa^{e}=/ further reduced into /=papáe=/ due to its frequent use.

It is a well-known fact that a few most frequently used verbs in French, Japanese and Russian are the most irregular verbs in these languages. Another similar example is contractions in English which involve auxiliaries which are a class of the most frequently used words in the English language. The same principle roughly seems to be applicable as to the frequency of vowel reductions in Tuamotuan also.

An important point to remember is that vowel reductions in Tuamotuan are basically a feature of faster styles of speech.

All of the following stress patterns as tested out against my informants for final verification and all of which have been accounted for in the previous sections, are actually used by them and are acceptable to them.

Slow Speech	Fast Speech	
/=fára+óa=/	/=faráo^{a}=/	'flour'
/=máa+úi+úi=/	/=máa+^{u}í^{u}i=/	'painful'

Slow Speech	Fast Speech	
/='áu+fóu=/	/='aúfo^{u}=/ /='á^{u}fo^{u}=/	'to pay'
/=páu+róa=/	/=paúro^{a}=/ /=pá^{u}ro^{a}=/	'all'
/=kóu+tóu=/	/=koúto^{u}=/ /=kó^{u}to^{u}=/	'you all'

6.3.4 Phrase Stress (/ˇ/)

Phrase stress is heavier and louder than primary stress. The domain of phrase stress is the phonological phrase defined earlier. (v. Chapter I). It occurs once in every phonological phrase.

Phrase stress occurs at a place where primary stress would normally occur including predictably shifted places already discussed in detail in § 0.3.3.2. Thus phrase stress is considered to be superimposed on primary stress. It is predictable in a great majority of cases, occurring on the last primary stress available within a given phrase.

e.g.

/#e+ra$\overset{\vee}{\acute{i}}$ti// ta+táa+tóu+kat$\overset{\vee}{\acute{i}}$ga// i+te$\overset{\vee}{\acute{i}}$e+h$\overset{\vee}{\acute{a}}$na#/

'Our food today is rice.'

Any utterance (i.e. phonological sentence), even one made up of as few as two single vowels, either or both of which may be preceded by a consonant, must contain phrase stress, i.e. /#(C)$\overset{\vee}{\text{V}}$(C)V#/.

e.g.

/#$\overset{\vee}{\text{a}}$ha#/ 'what?'

Phrase stress occasionally occurs at positions other than that described above and in such cases it indicates 'contrastive emphasis' of the particular morpheme on which it occurs. Thus, it is a phoneme and at the same time it is a morpheme, meaning 'contrastive emphasis'.

e.g.

/#tagáta+ínu+úa+ína+róa+teráke#/

'That person certainly is an ALCOHOLIC DRINK drinker.' which contrasts with:

/#tagáta+ínu+úa+ína+róa+teráke#/

or:

/#tagáta+ínu+úa+ína+róa// teráke#/

'That person is an alcoholic drink drinker.'

Although it is strictly speaking a phoneme, phrase stress is not marked in my examples given phonemically, except when it has a meaning of CONTRASTIVE EMPHASIS and occurs at an unexpected place. In these cases, phrase stress tends to occur on content words (to be called MAJOR MORPHEME in my discussions of Tuamotuan morphology-syntax) rather than on functional or relational words (to be called MINOR MORPHEME). This is consistent with its morphemic role as 'emphasis'.

Since there can be more than one primary stress in a single phonological phrase, degrees of loudness of different primary stresses within a phrase vary slightly. Phrase stress is much heavier and louder than any of the primary

stresses. Thus, those primary stresses closer to the phrase stress are louder than those more removed from it. Since phrase stress generally occurs on the last primary stress available in a phrase, the primary stress occurring closest to the utterance-initial position is generally the weakest.

NOTES

[1]In phonetic presentation of some examples in this section the symbol [.] (i.e. a lowered dot) is used to indicate a phonetic break.

[2]In phonetic presentation of some examples in this section, the symbol [ˊ] is used to indicate phonetic stress and the symbol [ˋ] to indicate phonetic non-stress or weak stress.

[3]These phonetic characteristics, especially features (1) and (3) here, are in close accordance with characteristics of plus juncture in Maori as described by Biggs (1961: 12).

[4]In slower deliberate speech, however, plus juncture is heard as a phonetic break at all times.

[5]From what little I know of German and Dutch, for example, it is not conceivable that stress patterns in English apply, as they are to these two other Germanic languages. (Compare the articulation of <u>the Japanese grammar</u>, <u>die Japanische Grammatik</u> and <u>de Japans(ch)e Grammatica</u> in English, German and Dutch, for example. In a great majority of cases, primary stress seems to occur on the identical vowel or syllable, but what about secondary, tertiary and weak stresses?)

Likewise, it cannot be anticipated that stress patterns in Tuamotuan will apply, as they are, to any other Polynesian languages, except perhaps Tahitian. From what little I observed of Marquesan by being together with Dr. Biggs occasionally during his informant sessions, a penultimate vowel before final juncture seems to be twice prolonged as a single vowel in other positions. This feature is not shared by Tuamotuan, for example.

[6]Phrase stress (/∨/) will thus be marked only when it occurs in an unusual position and has a meaning of 'contrastive emphasis'. Otherwise it will be omitted in my phonemic writing of Tuamotuan.

[7]If a stressed single vowel may be defined as one mora long, an utterance-final single vowel may be defined as half a mora long, as in the last /a/ of:

/tagata#/ 'person'

(v. Newbrand (1951: 22)).

[8]One of the most striking features of Tuamotuan morphophonemics is that mono-vocalic grammatical words (called preposed minor morphomes to be discussed on some other occasion) such as /e/ 'a', /te/ 'the' and almost all verbal particles such as /a/ 'imperative particle', /i/ 'past particle', etc. are often completely dropped in natural speech. The reason is obviously because these grammatical

words receive no phonetic stress (i.e. non-phonemic primary stress) due to their mono-vocalic structures.

Besides these mono-vocalic grammatical words, the initial vowels of tri-vocalic grammatical words such as /anake/ 'only' and /ihoa/ 'inevitability', which occur after content words and are to be designated POSTPOSED MINOR MORPHEME, are also dropped. Thus, /nake/ and /hoa/ ([xɔə]) occur far more frequently than the full forms of /anake/ and /ihoa/, respectively, in natural speech of Tuamotuan. Here again it is suspected that the non-stress on the initial vowels of these tri-vocalic words is the cause for the drop of the initial vowels in natural speech. (v. Chapter IX.)

[9]Semi-vocalized vowels, such as /i/ of /keiga/ 'bone', are more consonantal than the other vowels and sound like part of a following or preceding vowel, thus producing a kind of diphthong like that of English, together with the following or preceding vowel.

[10]Plus juncture in parentheses, which was also used in § 5.1.2.2.3, stands for loss of plus juncture in faster styles of speech. (also v. footnote no. 9 for Chapter V.)

[11]As was mentioned elsewhere, a single vowel bearing phrase stress (/ ∨/) in Marquesan is phonetically twice as long as a single vowel in other positions, although its

phonemic interpretation is a short single vowel. This extended maximum domain of Tuamotuan primary stress of /=(C)V_1(C)$\acute{V}_2\acute{V}_3$(C)V_4=/, where V_2 and V_3 are identical, is in close accordance with the above-mentioned feature of Marquesan phrase stress. Thus, this feature may be regarded as an areal feature covering at least all cases of Marquesan phrase stress and some cases of Tuamotuan primary stress.

From what little I have heard and read about Hawaiian, Marquesan, Tahitian and Tuamotuan, I am tempted to agree with Dr. Green's classification of Eastern Polynesian languages given in Green (1966: 34), which categorizes Marquesan into a Marquesic Subgroup of Central Eastern Polynesian Languages and Tuamotuan into a Tahitic Subgroup. It is a well-known fact among linguists today that there is an areal feature or two found across language families in many geographical areas of the world.

This tendency toward an occurrence of a long vowel (i.e. a sequence of two identical vowels in close transition) in a stressed position bearing either phrase stress (as in the case of Marquesan) or primary stress (as in the case of Tuamotuan primary stress in natural speech) may be an areal feature covering a still wider area of Polynesia.

[12]In natural speech, plus juncture before mono-vocalic forms such as /na/ 'a little away' and /ra/ 'very away'

is invariably lost, with consequent change of stress pattern. In this case, a vowel before the lost plus juncture may also be prolonged.

e.g.

(a) /háe+réé(+)ra/ (from /haére/ plus /ra/) (v. Chapter IX Sample Text sentence no. 28)

(b) /'áo+réé(+)ra/ (from /'aóre/ plus /ra/ (v. Chapter IX Sample Text sentence no. 102)

A phonetic break is heard in unexpected places such as (a) between /hae/ and /ree/ and (b) between /'ao/ and /ree/ in the above examples.

This feature of natural speech, however, properly belongs to morphophonemics and will be discussed exhaustively in a forthcoming paper on morphophonemics and morphology-syntax of Tuamotuan together with other morphophonemic features.

[13]The reader should note that the terms RISING and FALLING in this usage differ in meaning from the same terms as they are traditionally applied to diphthongs. In fact, RISING vowel clusters are most frequently falling diphthongs when both vowels are not syllabic.

[14]By word I mean the smallest item which will be offered in isolation by an informant.

CHAPTER VII

SYLLABIC STRUCTURES AND DISTRIBUTION OF SEGMENTAL PHONEMES

7.1 Syllabic Structures

No mention of syllable is necessary for the discussion of stress in Tuamotuan (and presumably also for some other Polynesian languages), as may be seen from earlier sections. Rather, an exhaustive discussion of stress can be made by setting up plus juncture (/+/) as a phoneme on the basis of certain observable phonetic features which makes primary stress completely predictable and thus non-phonemic.

It cannot be overly emphasized that it is NOT that plus juncture is set up to make stress predictable. As was shown already, plus juncture is set up primarily on phonetic grounds.

The syllable of Tuamotuan is discussed in this section primarily because it is a convenient reference point for the description of Tuamotuan phonotactics.[1]

Syllable division occurs before every consonant and at every juncture. The latter includes all final, non-final and plus junctures. Thus, /=maa+ui+ui=/ 'painful', for example, has three syllables, composed respectively of CVV, VV and VV.

The syllabic structures of Tuamotuan are V, CV, VV, CVV, VVV, and CVVV. The implication of this statement is

that a morph of Tuamotuan will have the shape of V, CV, VV, CVV, VVV, CVVV or a combination thereof. It may be alternatively said that the phoneme, syllable and morph are hierarchically significant units by way of describing Tuamotuan: a syllable consists of a minimum of one phoneme or a combination of more than one phoneme; similarly, a morph consists of a minimum of one syllable or a combination of more than one syllable.

The reason why up to three vowels are included within a single syllable is because up to three vowels may occur within a single domain of primary stress, i.e. /=(C)VVV=/. Also, when vowel reduction occurs, it involves a minimum of two vowels and a maximum of three vowels. In the latter case, one or two of the three vowels may remain full vowels with the other vowel(s) becoming semi-vocalized, as was already demonstrated in § 6.3.2.3.4. These are the reasons why VV, CVV, VVV and CVVV, in addition to V and CV, are also included in syllabic structures of Tuamotuan.

The earlier statement that syllable division occurs before every consonant and at every juncture also demands further explanation.

Syllablicity is associated with phonetic peaks. The phonetic peak in its turn is associated with vowel(s) rather than consonant(s). In view of this phonetic peak, it appears valid to consider that not only junctures but also consonants play similar roles in the syllabic division

of Tuamotuan. In /=kere+kere=/ 'black', for example, there are four syllables of .ke.re.ke.re. with /r/ carrying a double valence of a consonant and a syllable division marker.

7.2 Distribution of Segmental Phonemes

All possible V, CV and VV syllables occur except */fu/, */fo/, */vu/, */vo/ and */uo/. Due to influence by Tahitian, /h/ occasionally fluctuates with /f/.[2] Although */fu/ does not normally occur, /fu/ was recorded instead of /hu/ just once, probably for this reason.

e.g.

/ufu/ (in free variation with /uhu/)
'a variety of fish (usually blue in color)'

Of the 275 mathematically possible CVV syllables, all except the following 62 occur:

noi, gii, gei, gui, voi, vui, 'ai, hoi, vie, vee, voe, vue, fie, fae, foe, fue, hee, nea, gea, 'aa, vea, vaa, voa, vua, peo, teo, kuo, mio, moo, muo, nio, neo, nuo, gio, goo, 'ao, ruo, vio, vuo, fio, feo, fao, fuo, heo, huo, piu, kui, kuu, miu, meu, neu, nuu, 'iu, giu, geu, guu, viu, feu, fuu, hiu, 'eu, 'uu.

Frequency of occurrence of VVV and CVVV syllables is extremely low. No cases of VVV syllables have so far been recorded.[3] The following is a list of some of the CVVV syllables recorded.

/'aua/	/kaua/	'a palisade, fence, barrier' as in /kaua+puaka/ 'pigs' palisade'
/teie/		'this'
/touo/		'egg (of a hen)'
/hoaa/		'lake'
/piee/		'foot' (a unit for measurement of length) (Fr. 'pied')
/toau/		'ocean'
/goio/		'a variety of bird'
/=paau=/ as in /paau+tuutu/[4]		which means 'well built, sturdy, strong'

As was demonstrated in § 6.4.3.2.1., the maximum domain of primary stress in natural speech is /=(C)V_1 (C)V_2V_2(C)V_3=/: (with at least one consonant required). It follows that the number of CVVV syllables is increased accordingly in natural speech.

e.g.

/=hokí(+)ía=/ (from /=hóki+ía=/)	(two syllables of CV and CVVV) (three syllables of CV, CV and VV) 'also plus 'reference'
/=hiá(+)átu=/ (from /=hía+átu=/	(two syllables of CVVV and CV) (three syllables of CVV, V and CV) 'passive' plus 'away'
/=tugá(+)áne=/ (from /=túga+áne=/	(three syllables of CV, CVV and CV) (four syllables of CV, CV, V and CV 'the male of two siblings'

To sum up, all vowels occur in syllable initial, medial and final position. Long back vowels /uu/ and /oo/ occur after /f/ and /v/ only in a limited number of words

given in the next paragraph. All possible vowel pairs occur, including identical pairs which are heard as long vowels in natural speech.

Consonants occur in syllable initial position only. /f/ and /v/ occur before the long back vowels /uu/ and /oo/ in loans only.

e.g.

/'ifoo/	'must (preposed verbal particle) < Fr. 'il faut'
/'afoo/	'a Chinese man's name' < Chinese?
/'ivoo/	'a girl's name' < Fr. 'Yvonne'
/navuu/	'a place name' < Eng. 'Nauvoo' (in Illinois, U.S.A., mentioned in one of the Mormon publications translated into Tahitian)

7.3 Intrusives [y], [w], (/r/) and /'/ (glottal stop)

7.3.1. Structural Pressure toward CV(V(V)) Syllables

If morphophonemics is defined as "the study of the replacements, losses, and additions of phonemes in the morphology of a language" (v. Pike (1947: 242)), discussion of intrusives should perhaps properly belong to morphophonemics. Brief mention of intrusives in Tuamotuan may still be conveniently made here in connection with the syllable, because syllabic structures appear to be responsible for some morphophonemic features of Tuamotuan. In this section I use such terms as WORD and MORPH(EME) for the reason stated above, although strictly speaking this might be considered a mixing of levels.

First, the concept of INTRUSIVES needs to be illustrated with some examples from English.[5]

English has the so-called hiatus such as /ie/ (as in /krieyt/ 'create'), and /ui/ (as in /tuiyt/ 'to eat'), which native speakers of English tend to avoid by using semi-vowels /y,w/, as in:

/kriyeyt/	'create'
/tuwiyt/	'to eat'
/ ʒiyeynjel/	'the angel'
/drɔwawt/	'draw out'

or by using the intrusive /r/, as in:

/ əmerikəriz/	'America is...'
/lɔrənd.../	'law and order'

Although a glottal stop is not a phoneme in English, many speakers of English use it in some marginal words, namely interjections such as negative grunts. In the speech of many English speakers, it is also an allophone of /t/. (v. Smalley (1964: 102), Jones (1918: 150-152), Trager-Smith (1951: § 1.5) et al.).

Smalley (1963: 102) further states that:

"Many speakers of English use the glottal stop... frequently also as an 'attack' or 'opening' for words beginning with a vowel phoneme."

English syllables without an initial consonant or consonant cluster are rather rare. Although it is not impossible to articulate, a sequence of two full vowels

is probably felt to be somewhat clumsy by speakers of English. It is at least harder to pronounce. It is considered that for this very reason many speakers of English avoid hiatus by using intrusives.

Tuamotuan also has the intrusives [y], [w], /'/ (glottal stop) and probably also /r/, as will be described in detail in this section. It is considered that they are used by Tuamotuans probably because there is slight preference for (if not structural pressure working toward) the shape CV(V(V)) over the shape V(V(V)).

7.3.2 Intrusive [y]

A non-phonemic semi-vowel on-glide [y] occurs predictably between /e/ and /a/ separated by plus juncture.

e.g.

/ #e+[y] aha# / 'what?'

/ #haere+[y] ake+i+te+fare+'ana+nahi# /

'Go to the house tomorrow.'

/ #ho'e+[y]a+huru# / 'the same thing'

/ #a+tahi(+)ra+vau // a+kite+[y] ai // i+te+'oo+fii # /

'This is the first time for me to see a snake.'

7.3.3 Intrusive [w]

An intrusive [w] occurs predictable between /u/ and /e/ separated by plus juncture.

e.g.

/#ua+faka+rare+au+[w]ee // mea+nehe+nehe+roa// teraa+mara+nia# /

'I have heard that the girl is very pretty.'

/#au+[w]ee#/

'Oh! (a slight pleasant surprise)'

7.3.4 Intrusive /r/

At least two words so far recorded, both of which happen to be postposed minor morphemes (or grammatical words normally occurring after content words), have allomorphs beginning with /r/ in free variation:

i.e. /ake/ /rake/ 'a little away from both a speaker and a listener'

/atu/ /ratu/ 'away from a speaker'

as in:

/terake+tagata+i+koo+rake/ 'that man there'

which is in free variation with:

/terake+tagata+i+koo+ake/.[6]

and: /#haere+ratu#/ 'Go away!'

which is in free variation with:

/#haere+atu#/.

Allomorphs with an initial /r/ occur less frequently than the other forms. Some speakers of English use the intrusive /r/ in English more frequently than others. In the same way, a use of this Tuamotuan intrusive /r/ is to a large degree a matter of individual preference.

7.3.5 Intrusive /'/ (glottal stop)

7.3.5.1 Problem

The occurrence of glottal stop in utterance initial position poses some problems. In the first place, although a relatively large number of words begin with glottal stop, it is clearly audible only in slow deliberate speech, and its presence is not always easy to detect in natural speech. For example, both /'aore/ and /aore/ forms have been recorded in my transcriptions for 'not, no; there is no...'.

e.g.

/#'aore+e+paru+too+reu+reu// i+te+haga+hana#/

'There are no big fish these days.'

/#aore+koe//e+ta'a+ee// noo+hea+mai// teie+haga+manu+manu#/

'You do not know where these insects come from.'

In such cases, however, informants are always sure that glottal stop should be present. Moreover, such words are frequently borrowings from, or have cognates in Tahitian with glottal stop. In other cases, the glottal stop varies freely with /k/ or /g/ in certain words regarded as originally Tuamotuan by Tuamotuans. This kind of glottal stop is called a SYSTEMATIC GLOTTAL STOP.

The term 'systematic' used to describe the consistent word-initial glottal stop requires further explanation, since it simply means that the 'systematic glottal stop'

occurs RELATIVELY consistently as compared to the sporadic glottal stop to be discussed later. It does not mean, however, that the systematic glottal stop occurs in all environments regardless of the speed of speech and is clearly audible at all times. On the contrary, it is sometimes difficult to detect its presence. As was explained in the section on phrase stress, its presence occasionally is predictable only by the pharyngealization of an immediately following vowel/vowels. (v. § 5.1.2.1.4 and § 6.3.3.2.3.4.).

Secondly, there are words where glottal stop varies with its absence utterance-initially. Such words are considered by informants to begin with a vowel, and I regard the glottal stop as intrusive in the same sense as has been discussed for intrusives [y], [w] (and probably also /r/.) It is therefore, called an INTRUSIVE GLOTTAL STOP.

e.g.

/inu/ ~ */'inu/[7]	'to drink'
/i+hea/ ~ */'i+hea/	'where (past)?'
/ei+hea/ ~ */'ei+hea/	'where (future)?'

Each of the two different types of glottal stop is explained in further detail in the following subsections.

7.3.5.2 Intrusive Glottal Stop

Although a glottal stop is a phoneme, the occurrence of the sporadic glottal stop is parallel to that of the intrusive /r/ as in /rake/ whose meaning is identical with that of /ake/. Thus, the inconsistent sporadic glottal

stop is interpreted as an INTRUSIVE /'/ (GLOTTAL STOP). In phonemic writing, the intrusive /r/ in /rake/ need not be marked. Similarly, there is no need for the intrusive /'/ (glottal stop) to be marked in any way.

This analysis of the second type of word-initial glottal stop places the SPORADIC GLOTTAL STOP in the same class as the intrusive [y], [w] (and probably also /r/).[8]

It seems valid to state, in terms of general articulatory phonetics, that due to the nature of the human speech organs, it is very difficult for speakers of at least some languages of the world to start out any utterance with a monophthongal vowel.[9] This seems to be one of the basic reasons why various on-glides, phonemic or non-phonemic, are observed in many languages. Hence also the Tuamotuan intrusive /'/ (glottal stop), as well as the intrusive [y], [w] (and probably also /r/).

A most important point to be borne in mind about this discussion is that the phoneme /'/ (glottal stop) appears to be a recent addition to Tuamotuan due to Tahitian influence.

Certain shorter preposed minor morphemes (or grammatical words occurring before content words) which are made up only of a vowel/vowels, occur with this intrusive /'/ (glottal stop) very frequently because they typically occur in utterance-initial position.

Some examples are:

/e/ ~ */'e/	'a an (indefinite article)' (as in the example no. 1 below)
/ua/ ~ */'ua/	'perfective' (as in the example no. 2 below)
/a/ ~ */'a/	'imperfective (verbal particle)' (as in the example no. 3 below)
/i/ ~ */'i/	'past (verbal particle)' (as in the example no. 3 below)

no. 1) */#'e+pepenu+gutu+roa+toona#/
'His head is full of fleas.'
(lit. 'His is a very flea-head.')

no. 2) */#'ua+kii+roa+i+te+roe#/
'It (house) is full of ants.'

no. 3) */#'a+tahi(+)ra+vau// 'a+kite+ai// 'i+te+'oo+fee#/
'This is the first time for me to see a snake.'

7.3.5.3 Systematic Glottal Stop

It was noted above that initial glottal stop is difficult to hear. Informants themselves, even those who know what is meant by the term GLOTTAL STOP are sometimes momentarily uncertain as to whether or not it is present initially in a given item. They avail themselves spontaneously of the following three tests:

(a) the presence or absence of a word pair contrasting minimally in the presence or absence of an initial glottal stop;

e.g.

/ata/	'cloud; shadow'
/'ata/	(in free variation with /kata/) 'to laugh'

/oa+oa/	'narrow'
/'oa+ 'oa/	(in free variation with /koa+koa/) 'happy'
/oe/	'bell'
/'o'e/	(in free variation with /koke/) 'sword'
/ ori /	'wander(ing)'
/'ori /	(in free variation with /kori/) 'danc(ing)'
/ana/	'cave'
/'ana/	'coconut-grater'
/apu/	'to seize (usually said of a big fish attacking a smaller fish)'
/'apu/	(in free variation with /kapu/ (1) 'the shell of a coconut after it is grated.' (2) 'palm of the hand'
/ava/	'a pass or channel in a reef, suitable for large vessels'
/'ava/	'a variety of native plant'
/ho'e+a+huru/	'the same (thing)'
/ho'e+'ahuru/	'ten'

(b) the possibility of a parallel form (in what informants regard as original Tuamotuan) with /k/ or /g/;

(Some examples of the word-initial glottal stop which is in free variation with /k/ (or /g/) have already been given in the preceding paragraph. Further examples are:)

e.g.

/'opani/	(in free variation with /kopani/) 'to close (a door, etc.)'

/'ee+'ee/	(in free variation with /kee+kee/) 'armpit'
/'ere/	(in free variation with /gere/) 'nothing'

(c) the knowledge that the equivalent item in Tahitian has a glottal stop,

e.g.

/'uri+ta'ata/	'monkey'
/'uo+'uo/	'white'
/'uiti/	'wick of a lamp'
/'ana+vai+komo/	'river'

Unlike Tuamotuan which has /k/, /g/ and /'/ (glottal stop), Tahitian has no */k/ nor */g/, but /'/ (glottal stop) only. Thus, the frequency of /'/ (glottal stop) is extremely high in Tahitian. A number of Tahitian words begin with glottal stop. Only a few words (such as /uu/ 'milk' and /ufa/ 'female of an animal', both of which are also shared by Tuamotuan) begin with an initial vowel.[10]

As was described earlier, a great many Tahitian words constitute part of contemporary Tuamotuan vocabulary. Thus, the systematic word-initial glottal stop occurs in a great many Tuamotuan words that are also shared by (and are probably loans from) Tahitian.[11]

7.3.6 Extrasystematic Use of /'/ (glottal stop)

A glottal stop occasionally occurs where it would not normally occur in terms of the Tuamotuan canonical forms.

A brief mention of it might also be conveniently made here in connection with the syllable.

Although a glottal stop is not a phoneme in English, it occurs in a number of marginal words such as negative grunts and exclamations as was pointed out earlier. (v. Smalley (1963: 102)). Similarly, a glottal stop, which is a phoneme in Tuamotuan, occasionally occurs at word-FINAL position where no other consonant ever occurs in marginal words, as in:

/'aue'/ 'ouch!'

and:

/a'/ 'and then'

as in the second sentence below:

/#haga+raa+tou// i+te+haa+veke// peini+pau+roa+pate//

e...ta'amu// te+kiato+pau+roa#/

'They build a canoe, paint it all, apply the putty, and tie...all the arms together.'

/#ia+oti// a'//haga+te+tee+tee#/

'When it is finished, THEN they make a basket.'

/a'/ 'and then' given above is a word of very high frequency in Tuamotuan conversation and story-telling. It contrasts with /a/ (without word-final glottal stop) 'imperative verbal particle', as in:

/#a+haere+noa+koe#/ 'Just come!'

A strong glottal stop with an emphatic meaning sometimes occurs before a word beginning with a vowel.

e.g.

/#'ua+kite+vau// i+aana#/ 'I CERTAINLY saw him/her.'

which in a way contrasts with:

/#ua+kite+vau// i+aana#/ 'I saw him/her.'

e.g.

/#'ia+haere+(a)nake+koe+i+te+oire//

hoko+mai+te+tahi+fara+oa#/

'IF you SHOULD EVER go to the town, buy some bread (for me/us, etc.)'

which in a sense contrasts with:

/#ia+haere+(a)nake+koe+i+te+oire//

hoko+mai+te+tahi+fara+oa#/

'When you go to the town, buy some bread.'

NOTES

[1]"Phonemics can do without a phonetic definition of the syllable; syllables are convenient or necessary terms for sequences of established phonemes." says Hoenigswald (JAOS: 64), which is also quoted in Twaddell (1953: 426). A similar view is also expressed in Oota's excellent work on phonemics of American English, i.e. Oota (1959: 31-34 and 161-166). Also, see O'Conner-Trim (1953) and Haugen (1956).

It cannot be overemphasized that a typical domain of primary stress and a syllable are not synonymous terms, at least insomuch as Tuamotuan is concerned. /=atu=/ 'away from the speaker', for example, is one domain of primary stress but is made up of two syllables, i.e. V and CV.

[2]Although both /f/ and /h/ are phonemes both in Tuamotuan and in Tahitian, the occurrence of /f/ is higher in Tahitian and the occurrence of /h/ in Tuamotuan. Many words otherwise identical have /f/ in Tahitian and /h/ in Tuamotuan as in the Tahitian /fenua/ and the Tuamotuan /henua/, both of which mean 'homeland'.

[3]As will be demonstrated in § 7.3.5, a great majority of words of Tuamotuan do not begin with a pure vowel but rather with a glottal stop. For this reason, it is also

difficult to find a word with an initial syllable beginning with a pure vowel.

[4]The form */paa+utu+utu/ does not occur in the transcriptions and was rejected when it was tested out against an informant for double-checking.

[5]Phonemicization of English is that of American English by Dr. Akiro Oota as presented in Oota (1958) especially p. 162. Also see Jones (1918: 759-761: 197-198) et al.

[6]/terake/ 'that (a little away from both a speaker and a listener)' in the example here is slightly different. It is obviously a concatenation of /te/ 'a definite article' and /ake/ 'a little away', historically. Neither */teake/ nor */te+ake/ occurs in this environment, i.e. /terake+tagata/ 'that man a little away from us', but not */teake+tagata/ nor */te+ake+tagata/. /te/ and /ake/ concatenated, /terake/ with the /rake/ form is considered to have been established as part of one word (or Dr. Biggs' ISOLABLE CONSTITUENT OF CONTOUR SPAN) and the word is used by all speakers of Tuamotuan as /terake/.

[7]An asterisk means that the following form in phonemic writing is not a correct phonemicization of a particular word following the asterisk.

[8]It is worth while to note that Chomsky-Halle (1968: 307 and 315-316) recognize glottal stop to function as both a stop and a glide. In light of this information, the 'intrusive glottal stop' of Tuamotuan may well be considered a phonetic glide, like the non-phonemic [y] and [w] rather than a sporadic occurrence of the phonemic glottal stop (/'/). In a different framework, the intrusive /r/ might also similarly be treated as a glide.

[9]One of my informants, Marguerite White, once surprised me very much by making a similar comment in her own lay terms, when I was double-checking whether there was an UH SOUND before words beginning with a vowel.

For a definition of a monophthongal vowel, see Note no. 3 for Chapter III.

[10]In this respect, praise is due Andrews (1944) who marks not only the word-medial glottal stop, but also the word-initial glottal stop most accurately. The only deficiency is failure to note almost all phonemic long vowels. Example is /'oo+fii/ 'snake, serpent,' which is listed as */'ofi/ (v. Andrews (1944: 98)). An occasional error about the occurrence of the glottal stop is also observed as in /rao+'ere/ 'leaf (of a plant/tree)', which is listed as */ra'oere/ (ibid. 134). The fact remains, however, that this is the best of all Tahitian dictionaries ever published in English or in French.

[11]A word for 'river' in Tahitian is /'ana+vai+pape/. There is no river on any of the Tuamotuan atolls. Tuamotuans thus see a river for the first time in their life when they come up to Tahiti. /komo/ and /pape/ are regarded by native speakers of Tuamotuan as original Tuamotuan and Tahitian words for 'water,' respectively.

[12]There may be more than one way to articulate glottal stop as there are several ways to articulate the other stops of /p,t,k/. If it were true, I would set up another glottal phoneme which would also be a morpheme meaning EMPHASIS or the like. Since little appears to be known about glottal stop in terms of articulatory phonetics, this hypothesis is not investigated further.

CHAPTER VIII

BLENDING AND PHONEMIC ALTERNATION BETWEEN SHORT AND LONG VOWELS[1]

In citation forms, the contrast between long and short vowels is largely neutralized in pre-stress position (i.e. antepenultimate position) where vowels which are short in normal speech are lengthened. This variation (which is matched by informants' confusion as to whether the vowel is long or short) I call BLENDING. It is not equivalent to neutralization in one style of speech because in a few lexical items which have a minimal contrast between a short and a long vowel in pre-stress position in normal speech, the contrast is maintained in citation forms. Pre-stress vowels which are long in normal speech remain long in citation form, and informants are aware that they are definitely long.

Phonemic alternation between a short vowel and a corresponding long vowel is also observed in other positions in a few lexical items. Both the blending and the phonemic alternation will be exemplified in detail in the following subsections.

8.1 Blending

The first vowel of any tri-vocalic word, i.e. V_1 of any word of the shape $(C)V_1(C)V_2(C)V_3$ may be phonetically long, short, or anywhere in-between.

Examples are:

the first /a/ of	/=tagata=/	'man, person'
/o/ of	/=toau=/	'ocean'
/a/ of	/=pakoti=/	'scissors'
the first /a/ of	/=pakara=/	'slap, hit'
the first /e/ of	/=pepenu=/	'head'
the first /i/ of	/=pirehi=/	'to fly'

Asked for a Tuamotuan word for 'head', for example, a native speaker of Tuamotuan says, [pʰe·pénũ], [pʰeˇpénũ] with the first vowel long, short or anywhere in-between. When it is given in isolation, however, the first one, with an initial (phonetically long vowel generally occurs. Especially when a native speaker of Tuamotuan READS OUT tri-vocalic words, the forms with initial (phonetically) long vowels tend to occur most frequently.[2]

e.g.

[tʰɑ·ŋʌ́ ̃tʰə]	/tagata/	'man, person'
[tʰɔ·ʌ́ʊ]	/toau/	'ocean'
[pʰɑ·kɔ́ti]	/pakoti/	'scissors'

As may be seen from the examples given already, the environment where the contrast between long and short vowels is neutralized is immediately before the occurrence of non-phonemic primary stress occurs on a penultimate vowel counting back from any juncture (diagrammed as [=]

which stands for any of final, non-final and plus junctures (i.e. /#, //, +/)). It is considered that there is a WARMING-UP PERIOD over the initial vowel (which is phonetically long, short or anywhere in-between), before primary stress occurs. It is also considered that V_1 is prolonged (as long as a regular phonemically long vowel or slightly longer than a regular phonemically short vowel) to indicate the beginning of a new utterance. This accounts for the high frequency of occurrence of a phonetically long vowel when a word of the shape /=(C)V_1(C)V_2(C)V_3=/ is given especially IN ISOLATION.

Because of the blending of the contrast between long and short vowels before the occurrence of primary stress, it is extremely difficult at all times to decide whether the initial vowel of any tri-vocalic word in Tuamotuan is phonemically long or short. Asked if the first vowel of any of these tri-vocalic words is long or short, my informants were almost always UNable to give me any spontaneous answers.[3]

A good test, however, is to put a particular tri-vocalic word in the middle of a longer context of a (phonological) phrase or sentence and have the entire phrase or sentence articulated in natural speed, and see if it still sounds phonetically long, for phonetically long variation occurs almost exclusively:

(a) in utterance-initial position in citation form, or

(b) in a longer phonological phrase or sentence given extremely slowly as in an informant session.

If it is still long as in:

/taa+viri/ 'to squeeze (out)'

as in:

/#te+taa+viri+nei+au// i+te+komo#/ 'I am turning on the water.'

the initial vowel should then be interpreted as a phonemically long vowel and should be so marked as in the above example.

When tri-vocalic words are partially reduplicated as in the following examples,[4] the initial vowel is consistently heard as a phonetically long vowel both in deliberate speech and in natural speech, and is regarded as a phonemic long vowel.

e.g.

/=paa+'oti+'oti=/ 'to cut, trim a thing into smaller pieces; to cut, trim many things with scissors'
(from /=pa'oti=/ in free variation with /=pakoti=/ 'scissors')

/=too+reu+reu=/ 'big, large' (said of plural things)'
(from /=toreu=/ 'big, large')

/=aa+rea+rea=/ 'fun'
(from /=area=/ 'space, a spacious place')

The ending pairs of -/'oti+oti/, -/reu+reu/ and -/rea+rea/ are quadri-vocalic and are made up of a complete

reduplication of a bi-vocalic sequence, respectively. Before these sequences, long vowels of /paa/-, /too/- and /aa/- are used, probably because they are more symmetrical than their short equivalents of */pa/-, */to/-, and */a/-, in these environments, respectively. Phonemically long initial vowels are considered to occur in these partial reduplications of tri-vocalic words, primarily because the initial vowels of SIMPLE tri-vocalic words themselves can be phonetically long, at least in utterence-initial position citation form.

As was noted above, there are a few minimal pairs available contrasting in vowel length in pre-stress position.[5] At least the following cases have been recorded so far.

e.g.

(a)	/papa'i/	'wall' vs.
	/paa+pa'i/	'to write'
(b)	/vavaa/	'to make a hissing sound' vs.
	/vaa+vaa/	'a deaf mute'
(c)	/matau/	(in free variation with /kanehu/) 'fish hook' vs.
	/maa+tau/	'to be accustomed to'

Only in this case (i.e. when there is a minimal pair available in terms of vowel length in pre-stress position), were my informants sure of the length of the initial vowel of a tri-vocalic word. Because of these few exceptions,

the loss of contrast between long and short vowels in pre-stress position could not perhaps be regarded as a case of neutralization in a strict sense of the word, in spite of the fact that the neutralization DOES involve a great majority of tri-vocalic words of Tuamotuan.

Due to the blending of vowel length in pre-stress position, the general functional load of phonemic vowel length is considered to be somewhat reduced. Moreover, it is not too easy to find a minimal pair in which a short vowel contrasts with a corresponding long vowel only in one position, such as:

/'apa/	(in free variation with /kapa/) 'a type of dance and singing'	vs.
/'apaa/	'to kiss'	

There are many more minimal pairs in which a short vowel contrasts with a corresponding long vowel in more than one position, which should be called near minimal pairs in the strict sense of the term, such as:

/mama/	'to leak, escape'	vs.
/maa+maa/	'mother'	

(v. § 4.3 for more examples.)

8.2 Phonemic Alternation between Long and Short Vowels

The following words have been recorded with both long and short vowels (BUT WITH NO IN-BETWEEN CASES).

Group (a)

/tooku/ ~ /toku/	'my' (intrinsic possession)
/taaku/ ~ /taku/	'my' (extrinsic possession)
/toona/ ~ /tona/	'his, hers, (its)' (intrinsic possession)
/taana/ ~ /tana/	'his, hers, (its)' (extrinsic possession)

Group (b)

/tee+ie/ ~ /teie/	'this'
/tee+naa/ ~ /tenaa/	'that'
/tee+raa/ ~ /teraa/	'that over there'

An interesting fact about these words having phonemic alternations between long and short vowels is that the longer forms with phonemically long vowels typically occur under phrase stress, i.e. when phrase stress occurs on any of these words.

e.g.

/#e+pua+'are+henua+rave+'ohipa//tooku # /

'I have a working horse. (lit. Mine is a working horse.)'

/#maa+moe+huru+huru+roa//toona# /

'He has a sheep with a lot of hair.'
(lit. 'His is a sheep with a lot of hair.'

/#e+nira+kahu //tee+naa#/ 'That is a sewing needle.'

The opposite is not always true, however. When bearing no phrase stress, either the long or short form occurs in the case of words in group (a); but only the short form in the case of words in group (b). In example (1) given

below, both /toku/ and /tooku/ forms have been recorded; in example (2), both /tona/ and /toona/; but in example (3), only the short form of /tenaa/ has been recorded.

e.g.

(1) /# e+mea+poria+roa // toku paa+paa#/

'My father is very fat.'

(2) /# kakati+hia // tona+'avae // e+te+nao+nao // 'ina+ruki#/

'He had his foot bitten by a mosquito last night.'

(3) /# ua+reka+tenaa+puaka // ia+taa+koo+pihe#/

'That pig looks ideal to cook in the ground.'

NOTES

[1]This chapter, in a way, is a partial solution to Stimson-Marshall's famous HALF-LONG vowels criticized by Biggs (1965: 375), Elbert (1965: 1021) and White (1964: 519) in their reviews of Stimson (1964). Stimson's half-long vowels appear to have occurred most frequently in penultimate position, which to me is a great mystery to date.

[2]This pronunciation consistently occurred when I recorded Tuamotuan words for the Swadesh 215 Word List. These were pronounced three times each by an informant. When I was first eliciting Tuamotuan words for the Word List, the initial tape had pauses and all sorts of explanations by a group of informants. After having typed up all the Tuamotuan words thus elicited, I had one informant READ OUT all of them three times each on another tape, so that I would have a presentable tape, just in case anybody back in Hawaii asked me for Tuamotuan words for the Swadesh Word List, but also for a recording of them all.

It is usually taught in linguistic field methods classes that it is not at all a good idea to have any informants READ OUT something, because the reading, like singing, does not present a spoken language as it is. I myself have noticed several important facts about Tuamotuan

phonology, i.e. normally hidden underlying regularities in the Tuamotuan stress pattern, etc. by listening to this unnatural and distorted tape. In our age of DEEP STRUCTURE it may be old-fashioned to teach that reading is no good because it presents unnatural and distorted speech, even from the standpoint of the traditional structural or descriptive linguistics.

I owe my stress theory to:

(1) the above-mentioned tape,

(2) Bloomfield's Menomini Morphophonemics in which he used parentheses in a formula to indicate an underlying regularity covering a morphophonemic feature of the language,

(3) my elaborate work on Tuamotuan /p,t,k/ as assisted by my Korean colleagues here, by which I found out that many allophones of Tuamotuan /p,t,k/ were conditioned by a consonant immediately following them, and from which I began to suspect that vowels, too, might occasionally behave quite independently from their neighboring consonants, to say nothing of my year long discussion of stress with Dr. Biggs both here in Hawaii and in Tahiti.

[3]Some of my informants became aware of the blending under discussion here and began to say that the word for 'head' is /pepenu/ with the first long vowel or an initial

short vowel. The fact is that the first vowel was frequently heard phonetically as anywhere in-between also.

[4]The type of partial reduplication of a tri-vocalic word presented here is to be called SUFFIX REDUPLICATION in my forthcoming morphophonemics and morphology-syntax of Tuamotuan. As stress is made predictable not in terms of syllables but in terms of single vowels as was demonstrated in § 6.3.3.1, the types of reduplication appear to be best classified according to the number of reduplicated single vowels (either or both of which may be preceded by a consonant) rather than in terms of the traditional PARTIAL or COMPLETE reduplications, at least so far as Tuamotuan is concerned. Suffix reduplication of a tri-vocalic word should include some cases of what has traditionally been called COMPLETE REDUPLICATION of a bi-vocalic simple form.

e.g.

/iku+iku/	'to rub many times' (from /iku/ 'to rub once')
/repo+repo/	'dirty (said of certain particular points/parts of a thing/person)' (from /repo/ 'dirty (said of one particular spot only); 'very dirty (in a general way of an entire thing/ person)'

The meaning of SUFFIX REDUPLICATION is either (a) repetitive or (b) diminutive. This scheme should considerably reduce the number and types of reduplications in a Polynesian language, at least as far as Tuamotuan is concerned.

[5]Although I cannot fully substantiate this at this point, there is some evidence that either member of these minimal pairs might be a borrowing from Tahitian. /matau/ 'fish-hook' is regarded BY NATIVE SPEAKERS OF CONTEMPORARY TUAMOTUAN as a loan from Tahitian, or is at least a lexical item now shared both by Tuamotuan and Tahitian. Another word used in contemporary Tuamotuan for 'fish-hook', and which is regarded BY NATIVE SPEAKERS OF CONTEMPORARY TUAMOTUAN as an original indigenous Tuamotuan word, is /kanehu/, which incidentally is also a tri-vocalic word.

Dr. Biggs has pointed out to me, however, that it is not likely that /matau/ is truly a borrowing from Tahitian, because /matau/ is reconstructable for proto-Polynesian and because it has no phoneme diagnostic for borrowing from Tahitian.

CHAPTER IX

SAMPLE TEXT

The following is part of a natural conversation between two speakers of Tuamotuan recorded and transcribed in Tahiti, illustrating all the phonemes of Tuamotuan.

Many minor morphemes (i.e. grammatical words to be discussed later), especially monovocalic PREPOSED minor morphemes (i.e. grammatical words occurring before content words), are dropped in natural speech of Tuamotuan. (v. footnote no. 8 for Chapter IV). Also, some non-monovocalic minor morphemes and some major morphemes (i.e. content words also to be discussed in detail later) have shorter contracted forms in natural speech. In the following transcription, the dropped morphemes are all supplied and are given in parentheses. Contracted morphemes have their full forms in parentheses immediately below them. It is also one of the striking features of Tuamotuan morphophonemics that plus juncture between two identical vowels is almost always lost, not only in natural speech but also frequently in deliberate speech. As a result, the two identical vowels coalesce into one long vowel with primary stress occurring on both vowels. (v. § 6.3.3.2.1). The lost plus juncture is also given in parentheses.

Frequency count of segmental phonemes given in 5.2 is based upon the transcription given below (i.e. on the slower version and not on the faster version of the conversation). All non-Tuamotuan and non-Tahitian place names and personal names have been excluded from the frequency count. Examples are Victorine, Honolulu, Laie, etc.

The two speakers in the conversation (which is the beginning of an hour-long conversation) are Brother Daniel Tapea Makea of the Mormon Mission of Papeete, and Victorine (Viki) Temaehaga Mapuhi, a student at the Church College of Hawaii, who was back to Papeete last summer on vacation. Daniel served as my interpreter as well as one of my informants in Tahiti. In this conversation he asked questions of Viki, pretending that he did not know anything about her or Hawaii.

1.	/# o+vai// to'oe+igoa#/	D.	What is your name?
2.	/#o+Victorine//tooku+igoa#/	V.	My name is 'Victorine'.
3.	/#ehia+mata+hiti+to'oe#/	D.	How old are you?
4.	/#e+piti+'ahuru#/	V.	Twenty.
5.	/#a+tahi(+)ra// (a+)piti+ 'ahuru+atu+ai#/	V.	I have just become twenty.
6.	/#(te+)mana'o(+nei)+vau// ua+ruu+'au+roa//te+tagata// (i+)tei+(e+)nei#/	V.	I think the person (i.e. myself) is old now.
7.	/#e(+a)ha+hoki(+)ia// te+reira#/	D.	What is that (now)?

8.	/#ua+ruu+'au+ia// te+reira// (mai+te+mea+)e+piti+'ahuru +mata+hiti#/	D.	Do you mean to say that twenty is old?
9.	/#(te+)mana+'o(+)ra+koe// (e+)te+haere+atu(+)ra// (i+)te+aa+pii+haga#/	V.	Do you think we are getting younger?
10.	/#(ua+)reko+hia(+ee)// a+tahi(+)ra...// te+reira+taime// te+tiare// 'ua'a+ai#/	D.	It is said that the flower blooms at that time.
11.	/#'ai+aa#/	V.	My goodness, no!
12.	/#ua+oti+te+'ohipa#/	V.	The work has been finished.
13.	/#ua+ruu+'au(+vau)// (i)teie+nei#/	V.	I am old now.
14.	/#tirara+ihoa+ia#/	V.	It does not matter.
15.	/#noo+hea+mai+koe#/	D.	Where do you come from?
16.	/#no+taka+roa+mai#/	V.	I come from Takaroa.
17.	/#te+ora+nei//to'oe+haga +maa+kui#/	D.	Your parents are still living?
18.	/#te+ora+nei#/	V.	Yes, they are still living.
19.	/#'aore+raa//(raa+ua+)e+ noho(+)ra// i+ko+nei#/	V.	But they are not living here.
20.	/#tei+taka+roa#/	V.	They are in Takaroa.
21.	/#i+hea+koe+rave+ai// (i+)te+'ohipa#/	D.	Where do you work?
22.	/#'aore(+taaku)// (e+)rave+ haga+'ohipa#/	V.	No (doing) work.
23.	/#(e+)ori+haere+noa(+ee)// (ia+)ruki//te+hana#/	V.	I just walk around till the day becomes dark.
24.	/#(a+)hoki// i+te+fare// (a+)piko#/	V.	Then I go home and sleep.

25.	/#naa+hea// i+a+koe// ia+tama'a#/	D.	How do you eat then?
26.	/#(e+)kai+haere+noa(+vau)//	V.	I just eat around on the street.
27.	/#e+roaka+noa// ta'oe+katiga// na+te+pae+puromu#/	D.	Your food is obtainable on the street?
28.	/#(e+)mea+rahi// te+katiga// (e+)puke+hae+ree(+)ra#/	V.	There is a lot of food piled up.
29.	/#(e+)haga+ai+here+(a)nake// too+te+pae+puromu#/	D.	There is only rubbish on the road.
30.	/#te+reira// (e+)katiga+ia// (i+)te+kore+roa#/	V.	That is something to eat rather than (to say) nothing.
31.	/#(i+)hea+koe// (e+)noho+ai// i+ko+nei#/	D.	Where do you live here?
32.	/#e+noho(+a)na// i+koo// (i+)oro+vinii#/	V.	I live on Orovini Street.
33.	/#teraa+haga+pae+puromu// naa+koo(+)ra#/	V.	Those streets over there.
34.	/#(e+)ta'a+noa// i+a+'oe// ia+hipa+mai// (i+aaku)#/	V.	It is easy for you to understand it if you look at me.
35.	/#koe+(a)nake// (i+)to'oe+noho +haga#/	D.	Are you alone at your living place?
36.	/#'aore#/	V.	No!
37.	/#o+vau// e+tooku+haga +tagata#/	V.	Myself and some of my people.

38.	/#t(o)ku+maa+maa+ruu+'au +maa//o+(tu)kua+maa//teraa +haga+tagata// naa+koo#/	V.	My grandmother, my Auntie Tukua and her family and those people (are living there.)
39.	/#(i+)tooku+manako// (ua+)tere+ ake(+a)na+aa+nei+koe#/	D.	I suppose you have been somewhere.
40.	/#'aore(+o)+vau// (i+)kite +pine+pine+ana// i+a+'oe#/	D.	I have not seen you frequently (of late).
41.	/#i+hea// (o+)koe// i+teie +haga+hana// i+ma'iri+ake+nei#/	D.	Where have you been (in the past)?
42.	/#(i+)reva(+)atu+hoki+au// i+mea+na'a+ee...//i+Honolulu// e+hoki+mai#/	V.	I went to that place...that is to say, to 'Honolulu' and came back.
43.	/#i+reva(+)atu+(v)au// ho'e mata+hiti+e+te+'afa// (i+)teie+nei#/	V.	I have been away for one year and a half now.
44.	/#e+aha(+)ra+paha+ia#/	D.	How is it there?
45.	/#'au+ee#/	V.	Oh, very good!
46.	/#o+roto+roa+te+henua// o+te+popa'a#/	V.	It is a wonderful land of HAOLE (i.e. white men).
47.	/#ua+reka(+teraa+vahi)#/	V.	It (that place) is pretty.
48.	/#e+viru+paha//i+a+'oe// ia+fa'a+tia+mai+koe// i+to'oe+tere+haga// i+koo#/	D.	Perhaps you could tell us about your trip there?
49.	/#tei+i+a+'oe+noa+ia#/	V.	It is up to you.
50.	/#tape'a+noa+koe//(i+) tenaa +mea#/	V.	Will you hold this thing (i.e. the microphone)?
51.	/#(e+)mea+reka+roa//i+koo#/	V.	It is very pretty there.
52.	/#(e+)me(a)+maa+roa#/	V.	It is very clean.

53.	/#e+'ere+mi+ko+nei#/ (mai)	V. It is not like here.
54.	/#(ia+)haere+koe// na+ruga// (i+)te+puromu// (e+)kii+roa// to'oe(+naa)+nohi// (i+)te+repo#/ (nau)	V. When you walk on the road (here in Papeete, Tahiti), your eyes are full of dust.
55.	/#(e+)kamo+noa+te+nohi// (e+)haere+roa+ee// (e+)maki+roa +hia//to'oe+nau+nohi#/	V. You go on blinking your eyes till your (two) eyes become sick.
56.	/#i+koo//'aore(+koe)// e+maki+hia#/	V. Over there (i.e. in Hawaii) you do not become sick.
57.	/#ee.../(e+)mea+reka+roa+ pa'i// teraa+haga+henua#/	V. Those islands over there (i.e. the Hawaiian Islands) are certainly very nice.
58.	/#(e+)mea+maa#/	V. It is clean.
59.	/#(e+)mea+rahi//te+tagata// naa+koo#/	V. There are many men over there.
60.	/#(e+)mea+rahi+te+kaefa// (ia+)hina+garo+koe// (i+)te+kaefa#/	V. There are many men when you want them.
61.	/#(ua+)puke+noa//naa+te+pae +puromu#/	V. (They are)piled up on the street.
62.	/#'ai#/	D. Wow!
63.	/#(ia+)hina+garo+koe// (i+)te+vahine// (e+mea+) puke+haere+noa// naa+koo#/ (ua)	V. When you want women, they are all piled up there.
64.	/#i+a+'oe+(a)nake// (e+)reko +hia(+)ai+ee//(e+)mea+puke+ te+ria+haga+mea#/ (reira)	D. You are the only person who says those things (i.e. boys and girls) are piled up (there in Hawaii).
65.	/#'ai+aa#/	V. Really!

66.	/#(e+)mea+reka+roa#/	V. It is very nice (there).
67.	/#e+henua//no+te+popa+'aa (+)ra// e+reka+ihoa+ia+'oona#/	V. It is a land of white men and it is natural that the place is nice.
68.	/#e+aha+te+tumu// (o+)koe// (i+)tere+ai// (i+)ria#/ (reira)	D. What is the reason for you to have gone there?
69.	/#(e+)me(a)+haere(+au)// no+te+ha'a+pi'i+ra'a#/	V. I went to school.
70.	/#(i)hia+koe//(i)haere(+ai)// (i+te+)ha'a+pi'i+ra'a#/	D. Which school did you go to?
71.	/#i+koo//i+Laie+C.C.H.#/	V. Over there, to Laie, i.e. C.C.H. (Church College of Hawaii).
72.	/#e+mea(+)au+roa//(i+)koo#/	V. It is lovely there.
73.	/#(e+)me(a)+rahi// te+haga+ tagata#/	V. There are many people.
74.	/#(e+)mea+rahi+hoki// te+ tagata+tahiti+(i+)koo#/	V. There are also many Tahitians there.
75.	/#'aore+(o+)koe// (e+)ha'u+ mani+haga#/	V. You do not become bored.
76.	/#(e+)faa+rerei+pine+pine+ raa// (o+)kou+tou+(i+a)kou+tou+ iho#/	D. Do you often see each other?
77.	/#'e// (e+)faa+rerei+no(a)// maa+tou+ihoa#/	V. Yes, we naturally see each other all the time.

(which is a slip of the tongue for
/#e faa+rerei noa ihoa // maa+tou#/.
Like speakers of any other language, speakers of Tuamotuan also occasionally let out a sentence which is obviously ungrammatical once it is written out on paper.)

78.	/#(e+aha+)hoki+ta+kou+tou+ 'ohipa+e+rave//ia+faa+rerei+ (a)nake+kou+tou#/	D.	What do you do when you get together?
79.	/#e+kata(+noa+maa+tou)#/	V.	We laugh.
80.	/#e+te+kata+ore#/ (=/#e+kata+ore(+noa+maa+ tou)#/ ?)	V	We laugh heartily.
81.	/#ee.../teraa+ihoa+haga+peu+ kiro+o+ta+taa+tou(+)ra#/	V.	And...those inevitable bad manners of ours.
82.	/#e(+a)ha(+ia)// te+(haga+) hana// (o+)kou+tou// e+faa+ rerei+ai#/	D.	On which days do you get together?
83.	/#pau+roa+ia+te+hana#/	V.	Everyday.
84.	/#(e+)aha+ia#/	D.	Is that so?
85.	/#(i+)te+tahi+haga+hana// 'aore+(maa+tou+e+)haere// (i+)te+ha'a+pi'i+ra'a#/	V.	Some other days we do not go to school.
86.	/#noho+noa+(maa+tou+)i+te+ fare+ha'a+pi'i+ra'a//(e+)maa+ (noo te) ta'i+ta'i// (i+)te+tii+vii#)	V.	We just stay in the school building and watch television.
87.	/#ee...//(i+)te+tahi+haga+ hanaa(+)raa//(e+)haere+(a)tu// (i+)te+pae+toau+e+hopu+ai// (i+)te+toau#/	V.	And...on some other days we go to a beach and swim in the ocean.
88.	/#(aor)e+raa//ei+aha+raa+koe// (e+)faka+kite+(a)tu//(i+)te+ haga taga+taa(+)ra#/	V.	Do not tell this (fact) to the people (back here in Tahiti), though, will you?
89.	/#e+roaka+raa// to+kou+tou+ kite// (i+)te+rira+taime#/ (reira)	D.	Your knowledge is acquired at that time, though?
90.	/#e+roaka+roa#/	V.	Of course (it is).
91.	/#tei+i+a+'oe+pa'i(+ia)// te+fa'a+ito+ito(+haga)// e+ua+roaka+mia+raa// (o+)te+reira+ihoa+ia#/	V.	The amount of effort (you put in) depends upon you. And if knowledge can be acquired like that, why not?

(=/...e+mai+te+mea+e+roaka+mai+o+te+reira+ihoa+ia#/)

92.	/#ho'e+a+huru+aa+nei// (te+)faito+ha'a+pi'i+haga// i+koo// (e+)i+(to+)ko+nei#/	D.	Is the method of teaching the same (as here) over there?
93.	/#'aore// (e+)mea+kee+i+koo#/	V.	No. It is very different.
94.	/#i+koo//(e+)mea+mai+ta'i+ake +i+(to+)ko+nei#/	V.	Over there..that (i.e. the teaching method) (of) that place over there is better.
95.	/#o+vaho+roa// i+ko+nei#/	V.	It is terrible here.
96.	/#e+aha+ia#/	D.	Is that so?
97.	/#o+vaho+roa#/	V.	Terrible.
98.	/#e+aha+te+hora//(ta+)kou+ tou+ha'a+mata+haga+ha'a+ pi'i+ra'a#/	D.	What time do you start school?

(which is a misstatement for /#e+aha+te+hora// ta+kou +tou+ha'a+pi'i+ra'a//e+ha'a+mata+ai#/

99.	/#tei+i+a'oe+noa#/	V.	It is up to you.
100.	/#(ma)i+te+mea// e+ha'a +pi'i+ra'a+ta'oe+i+te+ po'ii(+)ra// (e+)haere+ (i)hoa+ia+koe#/	V.	If you have classes in the morning, you must go.
101.	/#(e+)'ao+ree(+)ra// 'aore+(i)hoa+ia#/	V.	If there is no class, you do not go then.
102.	/#tii+'ai+(i)hoa+ia// (i+)te+haga+hora+haere +haga(+ha'a+pi'i+ra'a)// (e+)haere+ai#/	V.	You must wait till time for class, and then you go.
103.	/#aa...// (e+)mea+ha'a +pa'o+(noa+)koe// (i+) te+mea+ta'oe//(e+)hina+'aro// e+haere// (e+)ha'a+pi'i#/	D.	Oh! You choose the subjects that you want?
104.	/#...te+mea+ta'oe// (e+) hina+'aro//'ee...#/	V.	Anything that you want...yes!

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(a) Abbreviations

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BSOAS — Bulletin of the School of Oriental and African Studies. London, England.

BSEO — Bulletin de la Société des Études Océaniennes (Polynésie Orientale). Papeete, Tahiti. French Polynesia.

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Lg — Language, Journal of the Linguistic Society of America. Baltimore, Maryland.

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