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Phonology and Morphophonemics of Yapese

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Phonology and Morphophonemics of Yapese

By

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A.B. (University of Cambridge) 1957
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DISSERTATION

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Approved:

[Signatures]

Committee in Charge

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I. Introduction

Yap is a high island in the western part of the Caroline Islands, some 450 miles southwest of Guam and 250 northeast of Palau. Its nearest neighbors are Ulithi and Ngulu, which are isolated atolls about 100 miles to the east and south, respectively. It is actually a compact group of four main islands separated by narrow channels and a canal, all set within a broad fringing reef. The outline of the group is a triangle 14 miles along the base, which trends SW-NE, and 6 miles in height, but due to extensive inlets and waterways the actual land area is no more than 37 square miles (Johnson, 1960). Though the hilly interior is easily accessible the centers of habitation are generally on or near the coasts.

Archeological evidence and tradition, as well as the incomplete records of early administrations, indicate that the island once supported a much larger population than it does now. A peak seems to have been reached around 1850 but no reliable estimate of the number is available. Thereafter the population declined, reaching about 8000 at the turn of the century and the lowest point of 2500 at the end of World War II (Gifford and Gifford, 1960; Hunt, et al., 1954). Since then it has been rising at an accelerating pace. Currently it stands at just over 4000.

The town of Colonia, situated on an arm of the sea on the largest of the four islands, is the major population center of Yap. It is the administrative center for Yap District, which includes, besides Yap proper, a number of atolls scattered for hundreds of miles to the East. The District is one of the six administrative divisions
of the Trust Territory.

From its discovery by the Portuguese in the sixteenth century to the present, Yap, like most of the other Caroline islands, has successively experienced Spanish, German, Japanese, and American administrations, with their attendant cultural influences. Loan words apparently originating from these contacts are evident in the current Yapese vocabulary. The following are some examples:

Spanish:  
- priest  
- mass  
- copper, tin can  
- prison  
- cat  

   pə:dreːˈy  
   miːsaː  
   kʊˈbreŋ  
   kaːlbuːs  
   gaːtuw

German:  
- bicycle  
- government  
- Christmas  
- 50¢ coin  
- paper  

   raːt  
   qaːm  
   baːyneːɡ  
   maːɡ  
   baːbyʊːr

Japanese:  
- carpenter  
- movies  
- photograph  
- wire  
- airplane  

   daːykiʃəɡ  
   kaːciːdoː  
   saːsiːɡ  
   seːɡ  
   hikoːkiː  ~ sikoːkiː

English:  
- warship  
- hour  

   maːnwaː  
   qaːwaː
Since the end of World War II Yap has been part of the U.S. Trust Territory of the Pacific Islands and the influence of American language and customs has been accelerating in recent years. English is used in the schools and the administration, and for speaking with Micronesians from other parts of the Trust Territory. The young people who are sent for advanced schooling or training on Guam or in Hawaii are frequently quite fluent in English but have considerable gaps in their knowledge of Yapese. Indeed there are families in Colonia now in which the children speak only English.

There are essentially no permanent Yapese-speaking communities outside of Yap, except for a small colony reported on Ngulu.

My, and my informants', impressions are that there are three or four dialect areas on Yap, with most of the younger speakers having a mixture of two or more dialects. This mixture probably results from the increased mobility in recent years brought on by schools, jobs, and other new institutions in addition to the still frequent practice of adoption of youngsters between different villages. The dialects are mutually fully intelligible.

Almost all my informants were men in their twenties and early thirties studying in Honolulu on different scholarships and
training programs. A few of them had lived in two or more different villages in childhood, and almost all of them currently live in Colonia. The one exception is my first informant, a girl who had left Yap at age 14 and is now living in the continental United States. She was 17 when I worked with her.

I will briefly survey previous works on Yapese, of which I have made little use because they are either prephonemic, too sketchy, or otherwise do not provide useful material for this phase of the research, or were inaccessible to me. The earliest known work is a grammar published in 1888 by a Spanish Priest (Ambrosio de Valencina, 1888). It is mentioned by the English traveler and doctor, William Furness, in his popular account of his two-month visit in Yap in 1902, "The Island of Stone Money . . ." (Furness, 1910). Furness' book contains an extensive word list and some grammatical notes. This contribution would be of interest now mainly as a source of possible clues to the recent historical development of the language and as an aid in the elicitation of now-disused words.

In 1953 the Mikro-bibliotheka Anthropos published on microfilm a Yapese grammar in manuscript by a German priest (Paulinus von Lörrach, 1953). The work was in all probability done before World War I. In 1910 the same author had published a short note drawing attention to the glottalized consonants in Yapese (idem, 1910).

The CIMA (Coordinated Investigation of Micronesian Anthropology) field trips sponsored by the Pacific Science Board in 1947-49 marked the beginning of intensive American interest in the
anthropology of Micronesia and the beginning of phonemic study of the languages. A few articles on, and grammatical sketches of, various Micronesian languages were eventually published, though none for Yapese. Isidore Dyen gathered material on the language during two short stays on Yap and recommended an orthography, which was subsequently taught in the schools but which has now fallen into disuse. A phonemicization and some comparative notes were distributed in an unpublished memorandum (Dyen, 1949).

The published results from the CIMA for Yap consist of a Final Report (Peabody Museum, 1949) and a series of articles by the anthropologist David Schneider and various collaborators, which contain little linguistic information but are interesting for cultural background. (William Lessa's works on Ulithi, dating from this period, are also valuable for the study of Yapese culture.)

In the past three years a number of unpublished reports on the historical phonology of Yapese were written by graduate students at the University of Hawaii. One of them, John Jensen, also has produced extensive pedagogical materials, including tapes, on Yapese for the Peace Corps which began sending volunteers to Micronesia in late 1966 (Jensen, 1967).

The future of research on Yapese seems comparatively well assured. The population is not in danger of dying out or of being assimilated. There is a growing awareness among Micronesians of the importance of maintaining their respective languages and cultures. For instance plans are now being considered by the native leaders for supporting research leading to orthographies and dictionaries in a number of the languages, among them Yapese, and for teaching the
native languages in the schools. Nor is there a lack of linguists working with Yapese or who might be recruited to this research. Both Jensen and I plan to continue our work with the language. Jensen, especially, plans to pursue research in the syntax. Other graduate students at the University of Hawaii may also be attracted. Informants are quite easy to find on the campus. Potential sources of financial support for work on Micronesian languages are not entirely absent. These circumstances do not, however, reduce the urgency of recording the state of the language as faithfully as possible since it is undergoing rapid change due to external forces. In fact special attention should be paid to documenting the speech of the older generations before it passes on with its speakers. The various dialects should also be recorded before they suffer any more mixture.

My own work began with a few sessions with the Yapese girl mentioned above in the latter part of 1965 in Berkeley. I continued with various informants in Honolulu at sporadic intervals during the following three years. The bulk of the material collected was directed toward solving phonological and morphophonemic problems. I consider six or seven of my informants to have been my "principal" informants. Generally, I worked with only one informant at a time, abandoning him for another only when he became unavailable.

Since the idiolects were noticeably different from each other, the data from each informant had to be re-elicited from the next informant before work could proceed with the new informant, i.e., before data from the new informant could be properly interpreted and integrated into the corpus. With each new informant a larger corpus
had to be re-elicited. Actually however, a complete, or near complete, re-elicitation was done only about three times.

It became evident that the informants were not representative of different dialects, but that each used features from more than one dialect. In most cases it was impossible to ascertain which of various forms given by an informant was from his "own" dialect. Variation affected both lexicon and grammar. Lexical variation occurs when certain items present in one idiolect were completely absent in another. Grammatical variation occurs on all levels: phonological, morphophonemic, and morphologic. A morpheme would appear in different idiolects with slightly different phonemic and morphophonemic representations, or would belong to different paradigms (e.g. "conjugations") in different idiolects.

I concluded however that all the idiolects do have the same stock of phonemes, morphophonemes, and grammatical (as opposed to lexical) morphemes (with a few notable exceptions which turned up early in the work), though their occurrence with any particular morpheme varies from idiolect to idiolect. That is, all the same contrasts, phonological and grammatical, could be established in each idiolect, even though the particular set of forms needed to demonstrate them might be different. True, certain contrasts are less productive in some idiolects than in others, but all the contrasts are at least present in all the idiolects (with the few exceptions alluded to above). This would present some difficulties in making a lexicon, but a single grammar, I believe, would be valid for all the idiolects.

This type of variation will be called dialect variation.
since it is presumably based on real dialect differences rather than on individual idiosyncracies, and to distinguish it from two types of variation which occur within the idiolect: individual oscillation and blending.

An informant is said to oscillate between two pronunciations of the same form, usually differing by only one phoneme, when he gives the two pronunciations either on two different occasions or on the same occasion, and when pressed would claim that both are acceptable and that he no longer knows which belongs to his native dialect. This variation is between two distinct phonemic shapes. Oscillation also occurs in morphology. The informant would put a morpheme now in one paradigm and now in another.

Blending (nothing to do with bilingualism or borrowing) occurs between two phoneme types in certain forms, e.g., between a short vowel and the corresponding long vowel, or between two phonetically neighboring vowels. This differs from oscillation in that the values in blending variation occur in a continuous range between the two phonemic types.

In phonology, these two kinds of individual variation are not simply neutralization of contrast in particular phonemic environments. The given contrast still exists in those environments; forms can be found which exhibit the contrast. It is only in certain morphemes that the contrast is suspended in a given idiolect. One might call it neutralization in certain morphemes. This set of morphemes itself may even have different members on different days.

Nor is oscillation the same as free variation unless this is qualified with the phrase "in certain morphemes." The term
vascillation frequently appears in the literature. It seems to cover both oscillation and blending. I have found it convenient to keep these two phenomena distinct. They are not unknown in languages (see, e.g., Gumperz, 1958), but do not fit well into a phonemic descriptive framework.

Oscillation and dialect variation occur frequently in morphology as well as in phonology. They are discrete variations. Blending, on the other hand, is a continuous phenomenon and affects only the phonology.

Whenever examples are given, they are chosen whenever possible from forms which do not suffer any of these variations (unless the purpose is to illustrate just such a variation). When for any reason a form is given which is peculiar to a certain idiolect or to two or three idiolects only (either with regard to lexicon or with regard to grammar) it will be labeled with the initial(s) of the informant(s) responsible for it.

The names of the principal informants are, in chronological order, as follows with the initials used later in referring to them:

Mrs. Flippin Pate (Fl)
John Mangafel (M)
Andres Tharngan (Th)
John Iou (I)
John Ranganbay (R)
Tom Tamngin (T)
Stanley Filmed (F)

Acknowledgements. I am indebted to the above for their patience and
enthusiasm as well as for the raw materials of the analysis; to Drs. George Grace and Byron Bender of the Linguistics Department, University of Hawaii, for suggestions and numerous discussions which have helped to clarify problems in the analysis; to the directors of the Pacific and Asian Linguistics Institute, University of Hawaii (Dr. Samuel Martin, 1965-66; Dr. Howard McLaughan, 1966-), for their generosity in providing the support and facilities, and an atmosphere conducive to the pursuit of the research; and to my thesis committee at the University of California, Berkeley (Drs. Chrétien, Carr, and Sawyer), for their encouragement and guidance both before and during my period of candidacy. Free computer time for processing my Yapese data was provided by the University of Hawaii Computing Center, and is hereby gratefully acknowledged.

The plan of the work is straightforward. Chapter II describes the segmental phonemes and their distribution, with proportionately greater attention being paid to the more refractory problems, which happen to afflict the vowels more than the consonants. Chapter III describes in detail the considerable morphophonemics, which also concern largely the vowels. Chapter IV surveys the principal morphological constructions--which also involve the most fusion and morphophonemic alternation. Chapter V brings together a large number of examples to show the rules in operation, and the ways in which they are responsible for the different phonemic shapes of individual morphemes. Chapter VI is an appendix containing the bibliography, a list of the abbreviations used, and a summary list of the morphophonemic rules for ready reference.
II.0 Phonemics: Introduction

The material for the phonemic analysis consists mainly of short utterances. The consonants, though numerous, offer little difficulty. There is little allophonic variation, and they are clearly distinguishable one from another. The vowels in stressed (word-final) syllable are also clearly distinguishable. In other positions, however, they are more variable in phonetic range and the number of contrasts is reduced in varying degrees. The status of vowel contrasts in general probably varies according to the rapidity of speech. No doubt, since this analysis is based on short utterances taken out of context, many more distinctions have been noted in certain positions than could occur in normal connected speech. These problems will be discussed in the appropriate sections. A detailed analysis of suprasegmentals has not been carried out, but some rudimentary observations on stress and syllabification will be made.

II.1 Consonants: Inventory

The consonant contrasts can be stated in terms of five points, or rather, nonoverlapping ranges, of articulation, seven manners, and a binary feature of glottalization. Of the $5 \times 7 \times 2 = 70$ possible points in this system of contrasts only 34 are actually used. The charts display the phoneme symbols used to represent them. The labels of the points of articulation are merely names of contrastive ranges and should not be taken literally. The actual range of articulation varies with the manners and will be specified
for each consonant in the following section. The phonemes in the irregularly shaped box in the first chart are plain consonants that have glottalized counterparts. The glottalized consonants make up the second chart. Each occupied position in the charts represents a unit phoneme, even though in some cases combinations of two (and in one case three) letters are used to represent it. Phonemes preceded by a hyphen occur only finally. The phonemes j and h occur only in post-contact loan words; the phonemes in parentheses are conspicuously rare phonemes, each occurring in not more than a handful of forms in the data.
<table>
<thead>
<tr>
<th></th>
<th>labial</th>
<th>dental</th>
<th>palatal</th>
<th>velar</th>
<th>glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>plain:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>voiced oral (fricative)</td>
<td>(b)</td>
<td>(d)</td>
<td>(j)</td>
<td>(g)</td>
<td></td>
</tr>
<tr>
<td>stop</td>
<td>(p)</td>
<td>(t)</td>
<td>(c)</td>
<td>(k)</td>
<td>(q)</td>
</tr>
<tr>
<td>fricative</td>
<td>(f)</td>
<td>(z)</td>
<td>(s)</td>
<td>(h)</td>
<td></td>
</tr>
<tr>
<td>nasal</td>
<td>(m)</td>
<td>(n)</td>
<td>()</td>
<td>()</td>
<td>()</td>
</tr>
<tr>
<td>semivowel</td>
<td>(w)</td>
<td>(y)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lateral</td>
<td>(l)</td>
<td>((-l_j))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>trill</td>
<td>(r)</td>
<td>((-r_j))</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

|        |        |        |         |       |         |
| **glottalized:** |        |        |         |       |         |
| stop    | \(p'\) | \(t'\) | \(k'\) |       |         |
| fricative | \(f'\) | \(z'\) |         |       |         |
| nasal   | \(m'\) | \(n'\) | \((-\eta')\) |       |         |
| semivowel | \(-w'\) | \(-y'\) |         |       |         |
| lateral | \(l'\) | \((-l'_j)\) |       |       |         |
The palatalized liquids, /lj, l'i, rj/, are phonemic only in certain dialects. Except for these and perhaps one or two of the other rare consonants, all the consonants in these charts occur phonemically in all the idiolects. There is dialect variation between consonants in some forms, but this does not affect the system of contrasts or the distribution of the consonants. A few examples of such variation follows.

- **fingernail**: k'iyuŋ (T)  
  - **pig-pen**: su:m (T)  
  - **stir (in cooking)**: girfiy (I)  
  - **lay stones**: qubuguy (R)

- **t'iyuŋ** (others)
- **cu:m** (others)
- **girsiy** (others)
- **qufuquy** (others)
II.2 Consonants: Phonetics

The phonetic and allophonic details of the consonants are quite uniform among the various speakers. The phonetics and what little allophonic variation there is will be described in this section. The consonants are taken up first in sets according to point of articulation, and again in sets according to manner of articulation. Actual examples of the contrasts are all displayed together in the subsequent section.

Consonants by Position

Labials: /b p p' f f' m m' w -w'/

The labial consonants are all bilabial except the fricatives, /f f'/, which are labiodental.

Dentals: /d t t' z z' n n' l l' r/.

These all involve articulation in the dental or post-dental region. The fricatives, /d z z'/, are interdental. The stops and nasals, /t t' n n'/, are dental. When next to a light vowel (/i u e ö ø Ω/), whether long or short, all the dental consonants are palatalized. Palatalization is heaviest next to ö and ø, and least noticeable next to e. In identical vocalic environment the liquids /l l' r/ suffer greater palatalization than do the other dentals. Also, final dentals are more palatalized than non-final ones. The contrast between the dental and palatal liquids, /l l' r/ and /lj l'j rj/, is a separate problem and will be treated later (II.4).

Palatals: /j c s y lj l'j rj/.

This set encompasses a wide range of points of articulation. /j/ occurs only in recent loans. It is a post-dental affricate, with
little if any palatalization. /c/, on the other hand, is a palatal affricate next to most vowels. Next to /a/ and /o/ it is backed, almost retroflexed. In clusters with /r/ it is definitely retroflexed. Before front vowels it is heavily palatalized, and frequently released with a y-glide. In nonfinal position it has little friction, but in final position it is released with strong friction. /s/ is an alveolar slit fricative, usually slightly palatalized. The palatalization is especially strong next to /i u/. Before /u/ it is released into a y-glide.

**Velars:** /g k kʰ h η/

The position of articulation is normally velar, but slightly fronted next to front vowels (/i e ɛ ə ɔ/). The fronting is especially marked with the /η/.

**Consonants by Manner**

**Voiced orals:** /b d j g/

/b d g/ are normally lenis voiced fricatives with considerable friction. Occasionally they may be completely stopped, but never in initial clusters. Finally they generally undergo some devoicing. /j/ is completely stopped, being an affricate.

**Stops:** /p t c k/

These are all voiceless, fortis, and always involve complete stoppage. There is little if any aspiration. Before nonfinal juncture they are most frequently unreleased, except for /c/, which is affricated. In nonfinal position /c/ has little friction, but in final position it is released with strong friction.

**Glottal stop:** /q/

In rapid speech, and especially in intervocalic position,
the closure of the glottal stop is not complete, but is represented by a pharyngealization of the neighboring vowels and consonants.

**Glottalized consonants:**

/pʰ tʰ kʰ fʰ zʰ mʰ nʰ -ŋʰ -wʰ -yʰ lʰ -lʰj/

The articulation of the glottalized consonants is similar to that of their unglottalized counterparts except for the additional glottal coarticulation. This may not, in normal speech, involve a complete glottal closure but only a partial closure with considerable tenseness of the glottis and surrounding muscles, resulting in pharyngealization of the consonant and neighboring phonemes.

In deliberate speech the glottal closure is complete. The glottalized stops are released with the characteristic explosion of the air compressed between the glottis and the oral point of closure by the raising of the larynx and constriction of the pharyngeal walls. During the compression all other necessary muscles are also tensed in order to contain the pressure. Glottalized fricatives derive their friction from air expelled by the same process. Glottalized stops and fricatives are always released. With glottalized continuants (nasals, semivowels, liquids), no pressure is built up since the oral cavity is open, either directly or through the nose, to the atmosphere, but there is glottal closure, pharyngeal constriction, and general tenseness. In initial glottalized continuants the oral articulation and the glottal stop are arrived at at roughly the same time. In intervocalic position the glottal stoppage is usually achieved first. In both positions the glottal stop is released before the oral articulation is. In final position the glottal closure occurs only after the oral articulation has been
achieved. Final glottalized continuants, as opposed to final glottalized stops and fricatives, need not be released, although if they are it is the glottal closure that is released first.
II.3 Consonants: Distribution and examples of contrast

All of the consonants except for the few mentioned below enjoy a uniformly wide distribution. They are found initially, inter-vocally, and finally. There are no significant restrictions, except in clusters, which are described elsewhere. The exceptions are /w y q l r lj r nj/, which occur only finally.

The frequency of occurrence of the consonants in a list of words is not uniform. The final consonants listed above occur in not more than two or three morphemes each in each idiolect. The consonants /h j/ occur only in a few modern loans. The relative frequencies of the rest of the consonants may be summarized as follows. The most frequent consonant is /l/. The other plain consonants are more or less evenly spread out through the frequency spectrum, the rarest, /s/, having about 1/5 the frequency of /l/. The most prevalent glottalized consonant is /l'/, occurring about as often as /s/. The other glottalized consonants are of steadily decreasing frequency, the rarest, /l'/, occurring about one-tenth as often as /l'/.

In the accompanying charts are assembled examples of the consonants in different environments. In general each example may be paired with two or three others to illustrate contrasts between different pairs of phonetically similar phonemes. To further restrict the multiplication of examples, the vocalic environment has been kept as constant as possible. In most cases only /a/ or /a:/ occur. It is relatively easy for a field worker to find examples of all the consonant contrasts. These examples have therefore been held to a minimum. Detailed exemplification will be reserved for the
finer points of vowel phonology.
<table>
<thead>
<tr>
<th>Plain labials</th>
<th>initial</th>
<th>intervocalic</th>
<th>final</th>
</tr>
</thead>
<tbody>
<tr>
<td>/m/</td>
<td>door</td>
<td>my voice</td>
<td>fat</td>
</tr>
<tr>
<td>ma:b</td>
<td></td>
<td>lama:g</td>
<td>ma:m</td>
</tr>
<tr>
<td>/b/</td>
<td>ball</td>
<td>dolphin, duck</td>
<td>door</td>
</tr>
<tr>
<td>ba:t'</td>
<td></td>
<td>daba:r</td>
<td>ma:b</td>
</tr>
<tr>
<td>/p/</td>
<td>find</td>
<td>forest, bush</td>
<td>turn to look</td>
</tr>
<tr>
<td>pa:t</td>
<td></td>
<td>ma:pa:n</td>
<td>sa:p</td>
</tr>
<tr>
<td>/f/</td>
<td>scar</td>
<td>my pride</td>
<td>transfer</td>
</tr>
<tr>
<td>fa;z</td>
<td></td>
<td>qufa:g</td>
<td>qa:f</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Plain dentals</th>
<th>initial</th>
<th>intervocalic</th>
<th>final</th>
</tr>
</thead>
<tbody>
<tr>
<td>/n/</td>
<td>ten fish</td>
<td>spin twine</td>
<td>his food</td>
</tr>
<tr>
<td>na:f</td>
<td></td>
<td>fina:z</td>
<td>ga:n</td>
</tr>
<tr>
<td>/d/</td>
<td>collecting-bowl</td>
<td>showing</td>
<td>clothes</td>
</tr>
<tr>
<td>de:g</td>
<td></td>
<td>mada:g</td>
<td>ma:d</td>
</tr>
<tr>
<td>/t/</td>
<td>song</td>
<td>pulling</td>
<td>find</td>
</tr>
<tr>
<td>ta:n</td>
<td></td>
<td>mate:l</td>
<td>pa:t</td>
</tr>
<tr>
<td>/z/</td>
<td>outrigger</td>
<td>erasing</td>
<td>touching</td>
</tr>
<tr>
<td>za:m</td>
<td></td>
<td>maza:η</td>
<td>ma:z</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Palatals</th>
<th>initial</th>
<th>intervocalic</th>
<th>final</th>
</tr>
</thead>
<tbody>
<tr>
<td>/c/</td>
<td>fighting</td>
<td>rash, pimple</td>
<td>birthmark</td>
</tr>
<tr>
<td>ca:m</td>
<td></td>
<td>gaca:l</td>
<td>qa:c</td>
</tr>
<tr>
<td>/s/</td>
<td>threaten</td>
<td>turning to look</td>
<td>foot-hold</td>
</tr>
<tr>
<td>sa:z</td>
<td></td>
<td>masa:p</td>
<td>ta:s</td>
</tr>
<tr>
<td>Plain velars</td>
<td>initial</td>
<td>intervocalic</td>
<td>final</td>
</tr>
<tr>
<td>-------------</td>
<td>---------</td>
<td>--------------</td>
<td>-------</td>
</tr>
<tr>
<td>/ŋ/</td>
<td>to him</td>
<td>my throat</td>
<td>turn to windward</td>
</tr>
<tr>
<td></td>
<td>ṇa:k'</td>
<td>k'aĵa:q</td>
<td>fa:ŋ</td>
</tr>
<tr>
<td>/g/</td>
<td>burning</td>
<td>laying stones</td>
<td>fifty cents</td>
</tr>
<tr>
<td></td>
<td>ga:k'</td>
<td>ma:q̂a:d</td>
<td>ma:q</td>
</tr>
<tr>
<td>/k/</td>
<td>ghost</td>
<td>visit</td>
<td>his child</td>
</tr>
<tr>
<td></td>
<td>ka:n</td>
<td>le:ka:q</td>
<td>fa:k</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Plain liquids</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>/l/</td>
<td>voice</td>
<td>stone</td>
<td>taro</td>
</tr>
<tr>
<td></td>
<td>la:m</td>
<td>ma:q̂a:n</td>
<td>ma:l</td>
</tr>
<tr>
<td>/r/</td>
<td>water (sweet)</td>
<td>thither</td>
<td>preserved breadfruit</td>
</tr>
<tr>
<td></td>
<td>ra:n</td>
<td>ɲa:q̂a:m</td>
<td>ma:r</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Plain vs. glottalized</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>/p/</td>
<td>banana</td>
<td>cnut husk*</td>
<td>turn to look</td>
</tr>
<tr>
<td></td>
<td>pa:w</td>
<td>gapat</td>
<td>sa:p</td>
</tr>
<tr>
<td>/p'/</td>
<td>provisions for journey</td>
<td>its duration</td>
<td>be spilled</td>
</tr>
<tr>
<td></td>
<td>p'a:w</td>
<td>nap'an</td>
<td>ma:p'</td>
</tr>
<tr>
<td>/t/</td>
<td>song</td>
<td>pulling</td>
<td>light</td>
</tr>
<tr>
<td></td>
<td>ta:ŋ</td>
<td>mate:l</td>
<td>ma:t</td>
</tr>
<tr>
<td>/t'/</td>
<td>kind of song</td>
<td>right</td>
<td>carrying pole</td>
</tr>
<tr>
<td></td>
<td>t'a:y</td>
<td>ma:q̂a:w</td>
<td>ma:t'</td>
</tr>
</tbody>
</table>

**"cnut" = coconut**
<table>
<thead>
<tr>
<th>Plain vs. glottalized</th>
<th>initial</th>
<th>intervocalic</th>
<th>final</th>
</tr>
</thead>
<tbody>
<tr>
<td>/k/</td>
<td>ghost</td>
<td>visit</td>
<td>his child</td>
</tr>
<tr>
<td></td>
<td>ka:n</td>
<td>le:ka:g</td>
<td>fa:k</td>
</tr>
<tr>
<td>/k'/</td>
<td>biting</td>
<td>step over</td>
<td>burning</td>
</tr>
<tr>
<td></td>
<td>k'a:d</td>
<td>luk'a:f</td>
<td>ga:k'</td>
</tr>
<tr>
<td>/f/</td>
<td>picking cnuts</td>
<td>my pride</td>
<td>pride</td>
</tr>
<tr>
<td></td>
<td>fo:l</td>
<td>qufa:g</td>
<td>qu:f</td>
</tr>
<tr>
<td>/f'/</td>
<td>divide, distribute</td>
<td>he divided it</td>
<td>I'll take a step</td>
</tr>
<tr>
<td></td>
<td>f'ō:z</td>
<td>ke:f'ō:z</td>
<td>gu:f'</td>
</tr>
<tr>
<td>/z/</td>
<td>nit</td>
<td>kind of banana</td>
<td>touch</td>
</tr>
<tr>
<td></td>
<td>zi:l</td>
<td>pze:zā:w</td>
<td>ma:z</td>
</tr>
<tr>
<td>/z'/</td>
<td>pot</td>
<td>cut up</td>
<td>severed</td>
</tr>
<tr>
<td></td>
<td>z'i:b</td>
<td>z'e:zā:b</td>
<td>ma:z'</td>
</tr>
<tr>
<td>/m/</td>
<td>fifty cents</td>
<td>electricity</td>
<td>outrigger</td>
</tr>
<tr>
<td></td>
<td>ma:g</td>
<td>ga:mi:g</td>
<td>za:m</td>
</tr>
<tr>
<td>/m'/</td>
<td>tie up</td>
<td>joint</td>
<td>death</td>
</tr>
<tr>
<td></td>
<td>m'a:g</td>
<td>ta:m'īŋ</td>
<td>ya:m'</td>
</tr>
<tr>
<td>/n/</td>
<td>a sprout</td>
<td>my drink</td>
<td>closed</td>
</tr>
<tr>
<td></td>
<td>nu:f</td>
<td>nu:nu:g</td>
<td>ma:n</td>
</tr>
<tr>
<td>/n'/</td>
<td>to erect</td>
<td>my opinion</td>
<td>bottle stopper</td>
</tr>
<tr>
<td></td>
<td>n'u:f</td>
<td>wun'u:g</td>
<td>mā:n'</td>
</tr>
<tr>
<td>/ŋ/</td>
<td>termite</td>
<td>my noise</td>
<td>piece</td>
</tr>
<tr>
<td></td>
<td>gā:l'</td>
<td>linā:g</td>
<td>ba:ŋ</td>
</tr>
<tr>
<td>/ŋ'/</td>
<td>(only final in one morpheme in one idiolect)</td>
<td>ga:ŋ' (I)</td>
<td>very big</td>
</tr>
<tr>
<td>Plain vs. glottalized</td>
<td>initial</td>
<td>intervocalic</td>
<td>final</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------</td>
<td>-----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>/l/</td>
<td>noseless</td>
<td>half</td>
<td>taro</td>
</tr>
<tr>
<td></td>
<td>luːg</td>
<td>balay</td>
<td>maːl</td>
</tr>
<tr>
<td></td>
<td>dead wood</td>
<td>light one's way</td>
<td>barracuda</td>
</tr>
<tr>
<td></td>
<td>l'uːd</td>
<td>gal'ay</td>
<td>maːl'</td>
</tr>
<tr>
<td>/w/</td>
<td></td>
<td>provisions for journey</td>
<td>paːw</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>stamen</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>faːw'</td>
</tr>
<tr>
<td>/w'/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>/y/</td>
<td></td>
<td>shadow</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>fəːy</td>
<td></td>
</tr>
<tr>
<td>/y'/</td>
<td></td>
<td>seedling</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>fəːy'</td>
<td></td>
</tr>
</tbody>
</table>
II.4 Consonants: Special problems

Palatalized liquids: /lj 1'j rj/

As has already been mentioned, the liquids (/l 1' r/) have palatalized allophones next to the light vowels. In some idiolects (M, Th, F) a very small number of occurrences of palatalized liquid phones were found where there is no adjacent light vowel. Almost all are final after long or short /o/. In these idiolects in this environment the palatalized phones contrast with the unpalatalized, as examples below will show, thus requiring a new series of phonemes, palatalized liquids, to be established. For transcriptional purposes however it will be convenient not to assign to these new phonemes those palatalized liquid phones that occur next to light vowels. These occurrences will remain as allophones of the "normal" liquids /l 1' r/. Thus the palatalized liquids /lj 1'j rj/ (unit phonemes) will occur only in a few idiolects, and in those idiolects only in a short list of words, and in these words only in a very limited environment, namely final after /o/.

In the accompanying chart are given all the words in which these palatalized liquids occur in the data. Next to them, in the second column, are given examples to show the contrast with the nonpalatalized variety. In the right-hand column are given cognate words in some of the idiolects that do not have the contrast. The pronunciations of all these words are quite clear, and there is no oscillation or blending for each informant.
<table>
<thead>
<tr>
<th><code>j'-idiolects (M, Th, F)</code></th>
<th>plain liquids</th>
<th><code>j'-less idiolects cognates</code></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>palatalized liquids</strong></td>
<td><strong>plain liquids</strong></td>
<td></td>
</tr>
<tr>
<td><code>/lj/</code></td>
<td><code>/l/</code></td>
<td><code>/l/</code></td>
</tr>
<tr>
<td>adze handle</td>
<td>sleep</td>
<td></td>
</tr>
<tr>
<td>mo:<code>lj</code></td>
<td>mo:<code>l</code></td>
<td>mo:<code>l</code></td>
</tr>
<tr>
<td>young betel nut</td>
<td>betel nut sheath</td>
<td></td>
</tr>
<tr>
<td>lo:<code>lj</code></td>
<td>qo:<code>l</code></td>
<td>qo:<code>l</code></td>
</tr>
<tr>
<td>ray fish</td>
<td>slanted</td>
<td></td>
</tr>
<tr>
<td>ro:<code>lj</code></td>
<td>qo:<code>o:l</code></td>
<td>rawul</td>
</tr>
<tr>
<td>concubine</td>
<td>famine</td>
<td></td>
</tr>
<tr>
<td>magolj (M, Th)</td>
<td>quyŋol</td>
<td>quyŋol</td>
</tr>
<tr>
<td>ripe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lo:<code>l</code></td>
<td>lo:<code>l</code></td>
<td>(T: lawul)</td>
</tr>
<tr>
<td><code>/rj/</code></td>
<td><code>/r/</code></td>
<td><code>/r/</code></td>
</tr>
<tr>
<td>cnut leaf's midrib</td>
<td>bamboo</td>
<td></td>
</tr>
<tr>
<td>qo:<code>rj</code></td>
<td>mo:<code>r</code></td>
<td>qawur</td>
</tr>
<tr>
<td>uncover a pot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fo:<code>r</code></td>
<td>fo:<code>r</code></td>
<td></td>
</tr>
<tr>
<td><code>/l'j/</code></td>
<td><code>/l'/</code></td>
<td><code>/l'/</code></td>
</tr>
<tr>
<td>kind of basket</td>
<td>all gone</td>
<td></td>
</tr>
<tr>
<td>fanol<code>l</code>j`</td>
<td>maz<code>ol</code> (I)</td>
<td>fanawul`</td>
</tr>
</tbody>
</table>
Semivowels: /y w/

/y/ and /w/ do not contrast with the vowels /i/ and /u/, since the latter never occur initially, finally or intervocally.

However, for distributional purposes such as the statement of syllable shapes, it is more convenient to regard /y/ and /w/ as consonants rather than as vowels. Examples of /y/ and /w/ in a wide variety of vocalic environments are given in the charts on the following pages.

In most idiolects there is a small collection of common morphemes in which final /y/ oscillates with /q/. Some of them are listed here:

- of or for it: riːy ~ riːq
- this, here: neːy ~ neːq
- put down: taːy ~ taːq
- there is: baːy ~ baːq
- to see: guy ~ guːq
<table>
<thead>
<tr>
<th></th>
<th>/y/</th>
<th>/w/</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>bone</td>
<td>yi:l</td>
<td>(week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>wi:k)</td>
</tr>
<tr>
<td>eat meat alone</td>
<td>ye:n</td>
<td>turtle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>we:l</td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>white</td>
</tr>
<tr>
<td></td>
<td></td>
<td>we:c</td>
</tr>
<tr>
<td>knife</td>
<td>ya:r</td>
<td>weak, lose</td>
</tr>
<tr>
<td></td>
<td></td>
<td>we:r</td>
</tr>
<tr>
<td>date</td>
<td>ya:r</td>
<td>bait</td>
</tr>
<tr>
<td></td>
<td></td>
<td>wa:l</td>
</tr>
<tr>
<td>writing</td>
<td>yo:l</td>
<td>fortune</td>
</tr>
<tr>
<td></td>
<td></td>
<td>wo:l</td>
</tr>
<tr>
<td>cry</td>
<td>yo:r</td>
<td>the same as</td>
</tr>
<tr>
<td></td>
<td></td>
<td>wo:l</td>
</tr>
<tr>
<td>to string</td>
<td>yu:y'</td>
<td>feather</td>
</tr>
<tr>
<td></td>
<td></td>
<td>wu:l</td>
</tr>
<tr>
<td><strong>Intervocalic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dust</td>
<td>fiya:z</td>
<td>my cnut tree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>niwa:g</td>
</tr>
<tr>
<td>roll a cigarette</td>
<td>ba:yi1</td>
<td>---</td>
</tr>
<tr>
<td>fingernail</td>
<td>t'iyuyq</td>
<td>---</td>
</tr>
<tr>
<td>cut, mow</td>
<td>baya:g</td>
<td>look for</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ga:we:g</td>
</tr>
<tr>
<td>crab</td>
<td>qayu:y</td>
<td>kind of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>gawuc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sea anemone</td>
</tr>
<tr>
<td>shark</td>
<td>qayouq (I)</td>
<td>road</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kana:woq</td>
</tr>
<tr>
<td>they cut it</td>
<td>karpuye:d</td>
<td>ring (finger-)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>luwe:w</td>
</tr>
<tr>
<td><strong>Final</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>umbilical cord</td>
<td>biy</td>
<td>a swamp plant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ri:w</td>
</tr>
<tr>
<td>split</td>
<td>se:y</td>
<td>scoop net</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ce:w</td>
</tr>
<tr>
<td>fish trap entrance</td>
<td>me:y</td>
<td>copra</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mare:w</td>
</tr>
<tr>
<td>mold (the growth)</td>
<td>bulaiy</td>
<td>village</td>
</tr>
<tr>
<td></td>
<td></td>
<td>bina:w</td>
</tr>
<tr>
<td>sea water</td>
<td>da:y</td>
<td>dry up</td>
</tr>
<tr>
<td></td>
<td></td>
<td>da:w</td>
</tr>
<tr>
<td>clam</td>
<td>go:y</td>
<td>red</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ro:w</td>
</tr>
<tr>
<td>to peel taro (v)</td>
<td>co:y</td>
<td>taro-peeling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>co:w</td>
</tr>
<tr>
<td>to join</td>
<td>pazuy</td>
<td>perspiration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>qazuw</td>
</tr>
</tbody>
</table>
II.5 Consonant clusters

Certain clusters of consonants arise from the dropping of intervening short vowels in rapid speech. Since the dropping depends on speed and is extremely variable, the phonemic status of such clusters is somewhat hazy. The problem is discussed in connection with short vowels in another section. Here I shall note only those clusters which seem not to be affected by rapidity of speech, i.e., that occur even in slow deliberate citations. There are no final clusters in any style of speech.

The majority of initial clusters are homorganic, with two consonants, and where the first consonant is one of the following: /b m g n l r y/. Most of the possible geminate clusters of these occur. The following are examples of all the initial homorganic clusters:

<table>
<thead>
<tr>
<th>woman</th>
<th>bpi:n</th>
<th>day</th>
<th>rra:n</th>
</tr>
</thead>
<tbody>
<tr>
<td>it's bent</td>
<td>bbug</td>
<td>bitter betel nut</td>
<td>yyo:y</td>
</tr>
<tr>
<td>open it!</td>
<td>mm3:n</td>
<td>bend it!</td>
<td>mbuguy</td>
</tr>
<tr>
<td>his food</td>
<td>gga:n</td>
<td>broken</td>
<td>mpil</td>
</tr>
<tr>
<td>I'm coming</td>
<td>ngu:b</td>
<td>mucus</td>
<td>llaq</td>
</tr>
<tr>
<td>blood</td>
<td>rcaq</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Medial clusters are more varied. The first member may be any nonglottalized consonant except stops. The second member need not be homorganic with the first. Occasionally longer homorganic clusters occur. See II.8 for some examples of medial clusters.
II.6 Syllables and stress

Syllables are either closed (ending in a consonant) or open (ending in a short or long vowel). They always begin with a consonant. A vowel, long or short, forms the nucleus. Sometimes syllables are bounded by clusters of consonants, but the vast majority of syllables are of the form CV(:) (open) or CV(:)C (closed).

Phonological words never end in a short vowel. They most frequently end in a consonant. Some recent loans and a few grammatical words end in long vowels.

Primary stress falls predictably on the final syllable if it is closed (-CV(:)C#), and on the penultimate if the word ends in a vowel (-CV(:)CV:>). Weaker stresses appear on the preceding syllables in the word, with syllables of these types receiving progressively weaker stresses: closed syllables with long vowels, open syllables with long vowels, and closed syllables with short vowels. Short open syllables are completely unstressed, which accounts for the drastic reduction of vowel contrast and the prevalence of blending in that position.

On the other hand, the final closed syllable, having the greatest stress, is the position of maximum vocalic contrast and contains the position of maximum consonantal contrast. The rare consonants /w' y' ñ' lj rj l'j/ occur only finally.
II.7 Vowels: inventory

Eight vowel qualities contrast with each other. In addition, length, written */*/, is contrastive. The term "vowel," in addition to meaning vowel phoneme or vowel quality, will frequently also be used to designate a vowel phoneme together with its accompanying length, if any. Thus, for instance, we may speak of "short vowels" and "long vowels" without undue circumlocution. Context will make clear which use of the word "vowel" is intended.

The symbols for the eight vowel phonemes are placed in the following chart at positions roughly corresponding to the phonetic features of their principal allophones.

<table>
<thead>
<tr>
<th></th>
<th>front</th>
<th>central</th>
<th>back</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>unrounded</td>
<td>unrounded</td>
<td>rounded</td>
</tr>
<tr>
<td>lower high</td>
<td>i</td>
<td></td>
<td>&quot;o&quot;</td>
</tr>
<tr>
<td>lower mid</td>
<td>e</td>
<td></td>
<td>o</td>
</tr>
<tr>
<td>higher low</td>
<td>&quot;e&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>low</td>
<td>&quot;a&quot;</td>
<td>a</td>
<td></td>
</tr>
</tbody>
</table>

For distributional and morphophonemic statements it is necessary to refer to certain subsets of the vowels. Each subset belongs to a two-way partition of the set of vowels. The partitions and the names of the subsets are as follows:
A rough count of about 5,000 vowel occurrences in a list
of morphemes gives the following proportions for each of the
vowels (the larger numbers have been rounded to integral values):

<table>
<thead>
<tr>
<th>Vowel</th>
<th>Count</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>13</td>
<td>a: 8</td>
</tr>
<tr>
<td>i</td>
<td>9</td>
<td>i: 4</td>
</tr>
<tr>
<td>u</td>
<td>10</td>
<td>u: 3</td>
</tr>
<tr>
<td>o</td>
<td>4</td>
<td>o: 2½</td>
</tr>
<tr>
<td>e</td>
<td>1</td>
<td>e: 4</td>
</tr>
<tr>
<td>ä</td>
<td>1/3</td>
<td>ä: 4</td>
</tr>
<tr>
<td>ö</td>
<td>1/2</td>
<td>ö: 3</td>
</tr>
<tr>
<td>ê</td>
<td>1/2</td>
<td>ê: 1</td>
</tr>
</tbody>
</table>

The following observations on the relative frequency of
the vowels are particularly interesting. First, disregarding
length, that is, considering long and short vowels together,
/a/ is by far the most frequent vowel. Next come /i/ and /u/
in about equal proportions. A large gap (a factor of two) then
separates each of these from the next most frequent vowel, /o/.
Considered as a group, the three major vowels /i u a/ account for
about twice as many vowel occurrences as do the five minor vowels.
Thus the disparity in frequency forms a striking distinction between
the major and minor vowels. Another difference between the two
classes is the following: Among the major vowels the short vowels
are conspicuously (1½ to 3 times) more frequent than the correspond-
ing long vowels. To a certain extent this is also true of /ö/.
But among the other minor vowels the reverse situation holds: The
long vowels are conspicuously (at least two times) more frequent
than the corresponding short ones.
On the other hand, partitions by length or height divide the vowel occurrences almost evenly: There are roughly as many long as short vowel occurrences, and the four high vowels as a group and the four low vowels as a group occur with almost equal frequency. It may also be noted that the two highest vowels /i u/ occur with about the same frequency as the two lowest vowels /æ ə/.

In addition to their prevalence, the major vowels as a class exhibit other properties which contribute to their central role in the phonology. Some of them may be briefly anticipated here. The most obvious is the symmetry and extreme separation of the three vowels in terms of articulation. This property of separation probably contributes to the fact that these (plus /o/ in a very few cases) are the only vowels which remain contrastive in the position of least vocalic contrast (see II.9c). Finally, what are known as morphophonemic "stem vowels" (III.F) are almost exclusively i, u, or a.
II.3 Vowels: phonetics

A summary of the phonetics and the allophony of vowels is given here. Greater detail will be supplied in the discussion of certain individual contrasts in the subsequent sections.

/ɪ/ is realized phonetically in the general region of [1]. Any of the following conditions may raise it slightly: being long, being next to a nonglottalized dental or palatal consonant, being in unstressed syllable (i.e., other than final closed syllable).

/e/ is lax and realized in the area of [É] or [E].

/ē/ is always tenser than the other vowels. It is quite low and is slightly variable in frontedness.

/ʌ/ is peculiar in many ways. In most idiolects it occurs exclusively next to dental or palatal consonants, and it is the only vowel that is regularly realized as a diphthong. Between a dental and a nondental, which is the most frequent environment, /æ/ is noticeably diphthongized, with a nucleus somewhere in the region of [a<] (higher for short than for long /ʌ/), and a higher front glide to or from the dental or palatal. The dental is palatalized, as was noted s.v. dental consonants. Compare:

\[
\begin{align*}
\text{dæg} & \quad \text{[dæg]} \\
\text{naf} & \quad \text{[næf]} \\
\text{kæn} & \quad \text{[kæn]} \\
\text{pegæ} & \quad \text{[pægæ]}
\end{align*}
\]

(The meanings are, respectively: to show, puncture, scrape pulp off a fruit pit, young boy.)

When both the preceding and following consonants are dentals or palatals, one of them is always one of these:
/l l' r y y'/. In most cases not both preceding and following consonants are in this class. In these cases a high fronting glide occurs next to the consonant of this class, but a less conspicuous glide also occurs next to the other dental or palatal. Compare:

\[ I: n \quad [ g a^n ] \quad z: l \quad [ o a^s ] \]

(Means: inside, wrestling.)

When both consonants are in this class, then one of them is /y/ or /y'/. The glides are less conspicuous, but the entire vowel, together with adjacent consonants, takes on a very palatalized color. Compare these examples contrasting /aː/ with /aː/ in these environments:

- Knife
- Bulaːy
- Date
- Raːy

In one idiolect (I), some a's occur not next to dentals or palatals, e.g.

- 1st. pers. sg. indep. pronoun: ːːːːː:\n- As contrasted with turning (boat) away from wind: \textit{gaːːːː}\n
But such a's oscillate or blend with a's. The /aː/ in such cases are simply very fronted without any diphthongization. (In the other idiolects, the cognate words all have a's; the last two examples would
be homonyms.)

Finally, it might be noted that the principal phonetic
cue distinguishing /œ/ from /a/ is neither the quality of the vowel
nucleus nor the presence of the glide but rather the palatalization
of the neighboring dental in the case of /œ/, versus the lack of
such palatalization for /a/.

/a/. Long /a:/ is low, unrounded, and central or
slightly backed from central. Short /a/ varies over a phonetic
range around [ə]. When not under stress short /a/ is quite lax and
tends to be colored by neighboring vowels.

/o/ is usually a lower mid back rounded vowel in the
phonetic neighborhood of [ɔ] or a little higher. It is tense.

/œ/ is a central vowel, in height between that of /e/ and
/i/, and slightly rounded. The rounding may fade to a mere
suggestion of rounding, especially between velars. There sometimes
is a slight fronting glide when approached from a bilabial or when
approaching a dental. Any adjacent dentals are palatalized, and
this frequently serves as a stronger cue than the vowel quality itself
to distinguish it from /o/.

/u/ corresponds in height to /i/. That is, it is usually
quite low, but is raised to various degrees by length, lack of
primary stress, and preceding /w/. 

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II.9 Vowels: examples

Exemplification of vowel and length contrasts will be more ample and detailed than that presented for the consonants in order to prepare for the vowel morphophonemics in the next chapter and because the systems of contrasts are more complex and the phonetics is sometimes more difficult.

Although the contrastive function of eight vowel qualities and of length is well established for the language, environments may be found in which the functional load of certain contrasts is reduced in varying degrees. Reduced contrast between two vowels in a given class of environments is manifested by any or all of the following circumstances: infrequent occurrence of one or both vowels in those environments; individual oscillation or blending between them in many forms; frequent dialect variation involving those vowels; high degree of predictability (complementary distribution) of the two vowels in those environments.

The systems of contrasts will therefore be discussed in terms of different environments, starting with environments in which the contrastive function is greatest. A gross classification of environments based on open and closed, final and nonfinal, syllables will be used. Further refinements will be superimposed on this system as necessary. For the present purposes, a vowel will be said to occur in a closed syllable if it is followed by a single final consonant or by a nonfinal cluster of consonants. Otherwise it occurs in an open syllable. The most common form of open syllables is CV(:); of closed syllables, CV(,:)C. We will first take up vowel contrasts in final
closed syllables.

Vowel and length contrasts: final closed syllables

This is the position of greatest vocalic contrast. It always receives primary stress. Examples of the eight long vowels will be shown first. In some idiolects there is a minimal series of monosyllables that contrasts all the eight long vowels:

run mi:l
rope on sail me:l
rotten me:l
war ma:l
taro ma:l
sleep mo:l
adze handle mo:l (I, R)
coil of string mu:l

In those idiolects (M, Th, F) that have /mo:lj/ instead of /mo:l/ for "adze handle" (II.4) the following examples can be used to demonstrate the contrasts of /ö:/ and to help dispel any suspicion that /lj/ might be used as a conditioning environment for /ö/.

|   | betel nut sheath | sleep | young betel nut
|---|-----------------|-------|--------------------
| /-o:l/ | qo:l | mo:l |
| /-o:lj/ | adze handle | mo:lj | lo:lj |
| /ö:lj/ | sail with wind | mo:lj | ripe |
| /ö:l/ | qö:l | lo:l |
The examples in the following lists show these contrasts operating next to y and w, though some of the pairs of diphthongs are at first hard to distinguish phonetically. Instances of -iy and -uw, instead of -i:y and -u:w, are shown since length of i and u is not considered contrastive before y and w respectively (see below).
<table>
<thead>
<tr>
<th>/i:/</th>
<th>bone</th>
<th>yi:l</th>
<th>-y</th>
<th>hair</th>
<th>piy</th>
</tr>
</thead>
<tbody>
<tr>
<td>/e:/</td>
<td>to plant</td>
<td>ye:n</td>
<td>-y</td>
<td>scrape</td>
<td>re:y</td>
</tr>
<tr>
<td>/ɛː/</td>
<td>---</td>
<td>fish trap entrance</td>
<td>me:y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>/æː/</td>
<td>his opinion</td>
<td>ya:n'</td>
<td>-y</td>
<td>put down</td>
<td>tä:y (T,R)</td>
</tr>
<tr>
<td>/aː/</td>
<td>sand</td>
<td>ya:n'</td>
<td>-y</td>
<td>escape</td>
<td>za:y</td>
</tr>
<tr>
<td>/ɔː/</td>
<td>writing</td>
<td>yo:l</td>
<td>-y</td>
<td>lobster</td>
<td>qara:go:y</td>
</tr>
<tr>
<td>/ʊː/</td>
<td>cry</td>
<td>yo:r</td>
<td>-y</td>
<td>to blow</td>
<td>pɔ:y</td>
</tr>
<tr>
<td>/uː/</td>
<td>poison</td>
<td>yu:b</td>
<td>-y</td>
<td>cut</td>
<td>pu:y</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>/iː/</th>
<th>w-</th>
<th>-w</th>
</tr>
</thead>
<tbody>
<tr>
<td>/iː/</td>
<td>(week) wi:k</td>
<td>swamp plant</td>
</tr>
<tr>
<td>/eː/</td>
<td>turtle</td>
<td>we:l</td>
</tr>
<tr>
<td>/ɛː/</td>
<td>to separate</td>
<td>we:r</td>
</tr>
<tr>
<td>/æː/</td>
<td>weak, lose</td>
<td>wä:r</td>
</tr>
<tr>
<td>/aː/</td>
<td>bait</td>
<td>wa:l</td>
</tr>
<tr>
<td>/ɔː/</td>
<td>fortune</td>
<td>wo:l</td>
</tr>
<tr>
<td>/ʊː/</td>
<td>the same as</td>
<td>wö:d (I)</td>
</tr>
<tr>
<td>/uː/</td>
<td>feather</td>
<td>wu:l</td>
</tr>
</tbody>
</table>
The following list attempts to show that the vowels are generally independent of the previous vowel:

/i/  my liver  qadi:g
    to smash  bili:g

/e/  bad  kire:b
    trying to hear  ta:te:l
    my feather  wule:g (R)

/e/  its keel  kilə:n
    its bole, stump  bulə:n
    its taste  lame:n

/a/  a sore  malə:d
    old tough cnut  ga:gə:l
    to spread (e.g. mat)  filə:z

/a/  step over  luk'a:ʃ
    dancing area  mala:ʃ
    make twine  fina:z
    dust  fiya:z

/o/  statue  liyo:s
    adolescent girl  rugo:d
    kind of bird  malo:b

/o/  respect  liyo:r
    a cover  qupo:ŋ
    swimming  mano:ŋ
/u/ I also came kugu:b
I don't like it dabu:g
a girl's name pitu:g

Length

In final closed syllable, as well as in other positions, the contrast of length is most productive with the vowel /a/. Although there is occasional dialect variation between /a/ and /a:/ (as in /ca:p/ (F) vs. /cap/ (others), "covered") there is little individual oscillation and practically no blending. For /i/ and /u/ the contrast is a little less productive; there is more oscillation and blending. Before final y and w there seems to be no contrast of short with long i and u respectively. For one informant (M), three lists of monosyllables were compiled, each list having about the same length as the others, one each for definitely short and definitely long occurrences of these vowels, and a third for monosyllables which the informant decided could be either short or long. The indeterminacy exists also for the other informants, though with slightly different sets of words. Nevertheless there is a large proportion of forms which they all agree on with regard to vowel length.

For the other vowels (the "minor" vowels) the productiveness of the length contrast is even more attenuated, as will be seen later.

The demonstration of contrast for length in final closed syllables will proceed in stages, beginning with those vowels for which length is most productive, namely the major vowels, /a i u/. The chart on the following page shows some minimal and near-minimal
pairs for these:

<table>
<thead>
<tr>
<th></th>
<th>short</th>
<th>long</th>
</tr>
</thead>
<tbody>
<tr>
<td>/a/</td>
<td>toss aboard</td>
<td>zap</td>
</tr>
<tr>
<td></td>
<td>carelessly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>its end</td>
<td>taban</td>
</tr>
<tr>
<td></td>
<td>rash, pimple</td>
<td>gacal (T)</td>
</tr>
<tr>
<td></td>
<td>hide</td>
<td>pac</td>
</tr>
<tr>
<td>/i/</td>
<td>shave</td>
<td>zir</td>
</tr>
<tr>
<td></td>
<td>suck</td>
<td>fil</td>
</tr>
<tr>
<td></td>
<td>unhang (sail)</td>
<td>pilig</td>
</tr>
<tr>
<td></td>
<td>to close</td>
<td>big</td>
</tr>
<tr>
<td></td>
<td>lean, fall over</td>
<td>zig</td>
</tr>
<tr>
<td>/u/</td>
<td>stuff in</td>
<td>cug</td>
</tr>
<tr>
<td></td>
<td>worry</td>
<td>rus</td>
</tr>
</tbody>
</table>
The contrast in final closed syllables of short /e ə ö/ with their long counterparts and with the three already established neighboring short vowels is less productive, due primarily to the relative infrequency of occurrence of these three short vowels. A substantial number of these rare occurrences are also prone to dialect variation and to blending with the corresponding long vowels. Each of these three short vowels will be contrasted in the following charts with its long counterpart and with the neighboring major vowel:

<table>
<thead>
<tr>
<th></th>
<th>short</th>
<th>long</th>
</tr>
</thead>
<tbody>
<tr>
<td>/i/</td>
<td>unhang</td>
<td>pilig</td>
</tr>
<tr>
<td></td>
<td>lean, fall over</td>
<td>zig</td>
</tr>
<tr>
<td></td>
<td>uncover a pot</td>
<td>firik</td>
</tr>
<tr>
<td>/e/</td>
<td>look for in a pile</td>
<td>fireg</td>
</tr>
<tr>
<td></td>
<td>a name (voc.*)</td>
<td>reb</td>
</tr>
<tr>
<td></td>
<td>stick into ground</td>
<td>reg</td>
</tr>
<tr>
<td></td>
<td>(T: re:ɡ)</td>
<td>pull</td>
</tr>
<tr>
<td></td>
<td>younger brother</td>
<td>tez</td>
</tr>
<tr>
<td></td>
<td>a name (voc.)</td>
<td>leq</td>
</tr>
<tr>
<td></td>
<td>a village name</td>
<td>mer</td>
</tr>
</tbody>
</table>

* Vocative form of a personal name.
<table>
<thead>
<tr>
<th></th>
<th>short</th>
<th>long</th>
</tr>
</thead>
<tbody>
<tr>
<td>/a/</td>
<td>toss aboard</td>
<td>zap</td>
</tr>
<tr>
<td></td>
<td>carelessly</td>
<td></td>
</tr>
<tr>
<td>bamboo fish weir</td>
<td>sa:gal</td>
<td>(I: sagâl)</td>
</tr>
<tr>
<td>wet</td>
<td>gardaq</td>
<td></td>
</tr>
</tbody>
</table>

<p>| /ə/   | enough      | gaman        | groping       | cana:n       |
|       | paddling    | ma:man       | usually closed | ma:man:ːn    |
|       | (not M)     |              |              |              |
| scraping pulp | naf (R)     | sever        | z'æ:b         |
| from pit |              |              |              |              |
| youth, boy | pagâːl      | lamp         | magâːl        |
| fishing   | ftaq        |              |              |              |
| (T: ftaːːq) |              |              |              |              |
| curse somebody | gar (M,I) | flatfish     | paː:r         |</p>
<table>
<thead>
<tr>
<th></th>
<th>short</th>
<th>long</th>
</tr>
</thead>
<tbody>
<tr>
<td>/u/</td>
<td>stuff in</td>
<td>cug</td>
</tr>
<tr>
<td></td>
<td>hole</td>
<td>kur</td>
</tr>
<tr>
<td></td>
<td>wash</td>
<td>luk</td>
</tr>
<tr>
<td>/ʊ/</td>
<td>a name (voc.)</td>
<td>ʊg</td>
</tr>
<tr>
<td></td>
<td>&quot;dear&quot; (term of address)</td>
<td>ʊʊ</td>
</tr>
<tr>
<td></td>
<td>yam</td>
<td>duqʊʊg</td>
</tr>
<tr>
<td></td>
<td>skull</td>
<td>ʊʊq</td>
</tr>
<tr>
<td></td>
<td>make a short sharp noise (R: cub)</td>
<td>ʊʊb</td>
</tr>
<tr>
<td></td>
<td>embellish a story</td>
<td>ʊʊq (T)</td>
</tr>
<tr>
<td></td>
<td>to perch</td>
<td>ʊʊq (M,I)</td>
</tr>
<tr>
<td></td>
<td>my shadow</td>
<td>ʊʊɡ</td>
</tr>
<tr>
<td></td>
<td>kind of fish</td>
<td>ʊʊ:1</td>
</tr>
<tr>
<td></td>
<td>to dig</td>
<td>fuqʊʊɡ</td>
</tr>
<tr>
<td></td>
<td>a name</td>
<td>ʊʊq</td>
</tr>
<tr>
<td></td>
<td>swim</td>
<td>ʊʊŋ</td>
</tr>
<tr>
<td></td>
<td>juggling balls</td>
<td>ʊʊ:n (F1,M)</td>
</tr>
<tr>
<td></td>
<td>call, hail</td>
<td>ʊʊŋ</td>
</tr>
</tbody>
</table>

Short /o/ occurs infrequently. Oscillation with /a/ occurs in a number of forms, e.g. /paf/ ~ /paf/ (R,F) "cool off", /gaf/ ~ /gaf/ (T) "rope." There is also frequent dialect variation, e.g. /k'ar/ (R,F) ~ /k'or/ (T) "spoiling (for fight)." Next to /w/ there is no contrast between /o/ and /a/ in any dialect. There is however little oscillation or blending between long and short /o/.

Below are some of the forms that consistently show /o/, /oː/, and /a/. Some of the forms with /o/ may also be compared with forms in the previous chart with /ʊ/ to establish that contrast.
<table>
<thead>
<tr>
<th></th>
<th>short</th>
<th>long</th>
</tr>
</thead>
<tbody>
<tr>
<td>/a/</td>
<td>end</td>
<td>tab</td>
</tr>
<tr>
<td></td>
<td>drowning</td>
<td>limac</td>
</tr>
<tr>
<td></td>
<td>fully cooked</td>
<td>n'ag</td>
</tr>
<tr>
<td></td>
<td>rash, pimples</td>
<td>gacal</td>
</tr>
<tr>
<td></td>
<td>move over</td>
<td>kan</td>
</tr>
<tr>
<td></td>
<td>kind of fish</td>
<td>qolopolay</td>
</tr>
<tr>
<td></td>
<td>abuse, waste</td>
<td>gazay</td>
</tr>
<tr>
<td>/o/</td>
<td>a name</td>
<td>rob</td>
</tr>
<tr>
<td></td>
<td>saliva</td>
<td>nuboc</td>
</tr>
<tr>
<td></td>
<td>step off</td>
<td>log</td>
</tr>
<tr>
<td></td>
<td>strangled</td>
<td>moqocol</td>
</tr>
<tr>
<td></td>
<td>decide</td>
<td>gon</td>
</tr>
<tr>
<td></td>
<td>road</td>
<td>woq</td>
</tr>
<tr>
<td></td>
<td>peel</td>
<td>qoloy</td>
</tr>
<tr>
<td></td>
<td>beard</td>
<td>ro:b</td>
</tr>
<tr>
<td></td>
<td>kind of eel</td>
<td>li:lbo:c</td>
</tr>
<tr>
<td></td>
<td>slanted</td>
<td>qolo:l</td>
</tr>
<tr>
<td></td>
<td>talk</td>
<td>no:n</td>
</tr>
<tr>
<td></td>
<td>kind of fish</td>
<td>so:n</td>
</tr>
<tr>
<td></td>
<td>lobster</td>
<td>qara:no:y</td>
</tr>
</tbody>
</table>
Short /e/ is the least well attested of the short vowels. There is only a small handful of occurrences in each idiolect, and most occurrences are in complementary distribution with short /e/: /ë/ occurs when the preceding vowel is a low vowel and /e/ occurs when it is a high vowel. Some of the examples below show this. When there is no preceding vowel however there is contrast between them.

<table>
<thead>
<tr>
<th></th>
<th>short</th>
<th>long</th>
</tr>
</thead>
<tbody>
<tr>
<td>/e/</td>
<td>a name (voc.) leq</td>
<td>cnut shell le:q (R)</td>
</tr>
<tr>
<td></td>
<td>cnut shell</td>
<td>leq (not R)</td>
</tr>
<tr>
<td></td>
<td>a name (voc.) mer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>many</td>
<td>pi:req</td>
</tr>
<tr>
<td></td>
<td>look for in a pile fireq</td>
<td></td>
</tr>
<tr>
<td>/ë/</td>
<td>a name (voc.) leq</td>
<td>someone be:q</td>
</tr>
<tr>
<td></td>
<td>almost ripe qël</td>
<td>turn around ce:1</td>
</tr>
<tr>
<td></td>
<td>stone fish trap qëc</td>
<td>white we:ç</td>
</tr>
<tr>
<td></td>
<td>to bump pärdeq</td>
<td>to meet maie:q (T)</td>
</tr>
<tr>
<td></td>
<td>to fly canëg</td>
<td></td>
</tr>
</tbody>
</table>
Nonfinal closed syllable

No drastic reduction of vowel and length contrast occurs in this position. Occurrences of /e ɐː/ are, however, very rare. Some examples of the eight vowels, long and short, appear below.

<table>
<thead>
<tr>
<th>Long</th>
<th>Short</th>
</tr>
</thead>
<tbody>
<tr>
<td>run along with</td>
<td>miːlnaːɡ</td>
</tr>
<tr>
<td>my strength</td>
<td>geːlŋig</td>
</tr>
<tr>
<td>stick together</td>
<td>cęːgliy</td>
</tr>
<tr>
<td>his eye</td>
<td>lāːnməːt</td>
</tr>
<tr>
<td>talk cleverly about</td>
<td>saːlpːi</td>
</tr>
<tr>
<td>take care of</td>
<td>goːnpˈiːy</td>
</tr>
<tr>
<td>its handle</td>
<td>koːlŋəːn</td>
</tr>
<tr>
<td>ribs</td>
<td>yuːmyaːw</td>
</tr>
</tbody>
</table>

Open syllables

Only long vowels occur in final open syllables. These are relatively rare, occurring only in recent loan words and in a number of grammatical morphemes which may occur finally. The final vowels that occur in these grammatical morphemes are /iː eː eːː aː/. The loan words add /uː oː/ to the list of possible final vowels.

The final /eː eːː/ do not contrast in native words, the lower /ɐːː/ generally occurring when the previous vowel is low, the /eːː/ otherwise. There is also much blending between these two in this final position.

Examples:

- -aː#
  question particle fa:
  dollar doːla:
-ē:#, -e:#

yes qe:
ligative particle -ē: ~ -e:
sentence connector qere:
a determiner fare:
kind of purse te:sa:ñe:

-i:#
negative particle da:gzi:
airplane hi:ko:ki:

-o:#
movies ka:ci:do:
car ka:rr:ro: (also ka:rr:row)

-u:#
Honolulu, kind of taro ho:nlu:lu:

In nonfinal open syllables all eight long vowels contrast, though with slightly reduced functional load in some environments. For instance, /ā:/ does not occur between dentals. Examples of the long vowels follow:

riddle sa:li:pow
deep sea re:gur
turn around ce:fiy
my opinion ŋā:n'u:g
you and I went kada:no:d
island do:ŋuc
a name qo:ce:n
rack (shelf) ru:liy

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Not all qualities that appear in short open syllables contrast. They may be assigned to not more than four contrastive ranges, represented by /i u a o/.

The contrast of /o/ with /a/ is very weak in that they are in almost complementary distribution, with /o/ occurring next to /u/ and when the following syllable contains a short /o/, while /a/ does not occur under these conditions. In a handful of instances /o/ occurs outside of these conditions, in environments in which it clearly contrasts with /a/. Some examples of the contrast:

near me    toqobèːg    my beard    rabèːg
wake somebody up    qodèːg    put to sleep    malaːg
kind of fish    ɳolọŋolay    half    balay
step off    log    fully cooked    n'ag

Short /o/ in open syllables occurs rarely, and then only before /o/ in the following syllable. In this position it is in complementation with most of the other vowels, but it will be assigned to /o/. Here are a few examples:

(to peel)    qoloːy
(name)    göqot
my skull    1oqoğ (T)

Short /i/ and /u/ in open syllables oscillate with each other in a number of words, e.g.,

chop, build (canoe)    dimow ~ dumow
cnut, sheath    qicif ~ qucif
kind of dance    ciruq ~ curuq

In general, however, they do contrast in this position,
regardless of the following vowel. Some examples follow.

<table>
<thead>
<tr>
<th>English</th>
<th>Bodo</th>
<th>English</th>
<th>Bodo</th>
</tr>
</thead>
<tbody>
<tr>
<td>boil</td>
<td>ligil</td>
<td>a name</td>
<td>quñin</td>
</tr>
<tr>
<td>wind</td>
<td>nife:η</td>
<td>make a noise</td>
<td>cube:η</td>
</tr>
<tr>
<td>its knot</td>
<td>pizigɛ:n</td>
<td>its carcass</td>
<td>dugurɛ:n</td>
</tr>
<tr>
<td>spread (e.g., a mat)</td>
<td>filä:z</td>
<td>my moon, term</td>
<td>pulä:ɡ</td>
</tr>
<tr>
<td>my wrapper</td>
<td>qima:ɡ</td>
<td>my breath</td>
<td>luba:ɡ</td>
</tr>
<tr>
<td>my liver</td>
<td>qazibo:ɡ (T)</td>
<td>saliva</td>
<td>ıuboc</td>
</tr>
<tr>
<td>to blow</td>
<td>ripö:ya</td>
<td>noose</td>
<td>qupö:1</td>
</tr>
<tr>
<td>my pain</td>
<td>qamizu:ɡ (T)</td>
<td>sharpen</td>
<td>quzum</td>
</tr>
</tbody>
</table>
II.10 Excrecent vowels

There is a class of positions in which, in some words, short vowels may oscillate phonetically between being present and being absent, depending on, among other things, the rapidity of speech. This phonetic indeterminacy occurs between certain post-vocalic and pre-vocalic consonant pairs: -VC₁C₂V-. Between some such pairs short vowels never occur, while between other pairs some vowel, short or long, always occurs. The indeterminacy occurs between pairs of consonants in neither of these categories. Examples of the first two categories will be given first.

Short vowels never occur in this interconsonantal position when the pair of consonants satisfies any of these conditions:

1. C₁ is w, y, or r. C₂ can be any consonant.
2. When C₁ = C₂ and they are not glottalized.
3. C₁ is a voiced continuant /m n l η/ and C₂ is homorganic.

To anticipate the morphophonemics, it is in this interconsonantal position that short vowels are dropped by a morphophonemic rule. Examples of these three classes of consonant pairs without intervening short vowel follow.

-wC-, -yC-, -rC- :

to herd fish  ruwliy  to haul  gocowriy
my eye  qowce:g  its body  dowqin
its skin  biyce:n  to roll cigarette  ba:yliy
to help  qaywe:g  my fingernail  t'yinu:g
his sadness  kirbe:n'  to bump  pardeq
mushroom  parfiy  my haunches  duqörle:g
\(-C_1C_1-\) :

you and I pushed it kaccugye:w to cut hair pullug
you went kammä:n husk-pounder ma:qqaq:w
shiver durruq to rest toffa:n
a name tamaggafe:l grey hair mannaq
a name fattun my headache qalenqe:g

continuant + homorganic consonant:
you pushed kampiq it was hung up kanzeq
these two gilne:y inside it tangin

A short or long vowel always occurs in this interconsonantal position when \(C_1\) is a stop (but not \(/c/\)) or is a glottalized consonant, and \(C_1 \neq C_2\). To anticipate another morphophonemic rule, whenever such a pair of consonants are juxtaposed without juncture at a morpheme boundary, a short vowel is inserted between them whose quality depends on the previous vowel.

Examples:

its noose qupale:n my waist lukunju:g
father citamanjy a place name qatali:w
gravel mak'ayug my right mat'owa:g
he liked it ke:t'ufa:g it's bad bakire:b
they washed it karlukye:d

Between other pairs of consonants in this position, in some words short vowels are sporadically dropped. Typically, short vowels in this environment are extremely short and unstressed when they occur. When they are not so short that their quality cannot be ascertained,
the quality is in general not predictable from the environment
(though there is a high correlation with the quality of the previous
vowel). They are therefore considered to be phonemic. However in
faster speech they may be dropped completely. The length of the
previous vowel, the vowel preceding \( C_1 \), also influences the
retention or dropping of this vowel. When the preceding vowel is
short, the short vowel between \( C_1 \) and \( C_2 \) tends to be retained. The
morphophonemic rule anticipated in the last paragraph also operates
here.

It is due to this indeterminacy that syllabification is
ambiguous in certain words and the inventory of consonant clusters
is variable.

Examples (written with the short vowel):

- my saliva \( \text{nubac\textsuperscript{e}:g} \)
- to submerge \( \text{to:lube:}\text{g} \)
- grope for \( \text{camaniy} \)
- tame \( \text{man\textsuperscript{a}mur} \)
- weaving, lying \( \text{malifiz} \)
- my height \( \text{n'uman\textsuperscript{i}g} \)
- heart of palm \( \text{ma:luk'a:n} \)
- my nose \( \text{p'izu\textsuperscript{u}:g (T)} \)
- wholesome \( \text{sagalo\textsuperscript{j}} \)
- twins \( \text{qaza\textsuperscript{a}:g} \)
- my liver \( \text{qaziba:}\text{g} \)
- to mix \( \text{qazuku\textsuperscript{y}} \)
- my flesh \( \text{qufina:}\text{g} \)
- its proximal part \( \text{talabale:n} \)
- to sweep \( \text{wolaguy} \)
III:0 Morphophonemics: Introduction

Most alternations in the phonemic shapes of morphemes fall into patterns which are largely predictable independently of the particular morphemes or classes of morphemes concerned. Other alternations do not fall into any such patterns, or into only relatively unproductive patterns. Such alternations are attributed to the existence of different allomorphs that must be listed, together with the conditions under which they occur, for each morpheme. These alternations are therefore called allomorphic, while the former are called morphophonemic.

In general, then, each morpheme is represented by one or more allomorphs. The shapes of these allomorphs most frequently do not correspond directly to those of any of the various phonemic shapes of the morpheme. Rather, they are chosen in such a way as to simplify the derivation of the various actually occurring phonemic shapes from them. These basic shapes are not considered as phonemic, but as morphophonemic. The greater part of each morphophonemic base form, however, principally the consonants, does not undergo any change during the derivation of the phonemic shapes. Morphophonemic transcriptions are enclosed in morphophonemic brackets, double slashes: //...//.

The phonemic shapes are derived from morphophonemic base forms by the application of morphophonemic rules, which form the principal subject matter of this chapter. This introduction presents the conventions used or assumed in the rest of the chapter.

Before any rules can be applied, a string of one or more
morphophonemic base forms must be assembled which represents a unit called a phonological word. Phonological word boundaries (\#) always fall at morphological word boundaries ( \( \mid \) ) but not at all of them or even consistently at the same ones. There is some variability depending on speed. We will be concerned only with morphophonemic alternations which occur between phonological word boundaries, wherever they do occur. All examples are to be understood as bounded by \#'s except where an initial or trailing hyphen indicates that the word has been truncated to eliminate material irrelevant to the example.

With few exceptions, the largest unit described in Chapter IV (Morphology) is a morphological word.

The lowest type of juncture is the morpheme boundary ( \( \mid \) ), which occurs between all morphemes in a string. Most of the rules have been written however in such a way that the existence of morpheme boundary is immaterial. In such cases it will not be explicitly marked.

After a string of basic allomorphs have been assembled, the rules in this chapter are applied one by one in the order presented. The precise constraints on the ordering of the rules (i.e., which rule must precede or follow which other rule) are specified with each rule, with examples given to show the necessity for the constraints. If only these constraints are observed the rules form a partially ordered set, with many pairs of rules whose mutual order remains unspecified. To simplify the presentation however the rules have been arranged into a fully ordered sequence, with related rules presented next to each other, as far as possible,
while observing the necessary ordering restrictions. In some cases
this full ordering has been taken advantage of to simplify some
environment specifications. In a few cases a rule, or a part of a
rule, has had to be repeated at two places in the sequence.

The necessity of ordering among rules is imposed by the
nature of the rules. The rules are context-dependent and
substitutive. That is, the rules in general specify the substitu-
tion of given symbols in the string by other symbols, if the context
to the left and to the right of the symbols satisfies certain
conditions. Thus, the replacement of symbols in the string by one
rule may create or destroy contexts required for the operation of
another rule, thus enabling or inhibiting the application of the
other rule. The resulting string would therefore differ according
to the order in which these two rules were applied. (See, for
instance, Chafe, 1968.)

Each rule has a unique number consisting of a capital
letter followed by a digit, sometimes further followed by a lower
case letter, e.g., X2b. The alphabetical and numerical order of
the identification number reflects the serial ordering of the rules.
A capital letter represents a set of related rules. Numbers that
differ by only the lower case letter label rules that are in some
way very closely related, such as rules pertaining to the same
symbol under different environmental conditions.

Each rule is stated "officially" once, and this statement
is enclosed in a box. The notation is as follows. The left and
right environments of the symbol(s) being replaced are written to
the left and right, respectively of, the symbol(s). The symbol(s)
to be substituted for the old one(s) are written directly below it, and joined to it by an arrow. For instance, rule Fla has the following shape:

\[ V(\cdot)CV# \]

When a symbol develops where there was none before, the arrow originates from a gap between the left and the right environment. When a symbol drops, the arrow points to the zero symbol, \( \emptyset \). Examples are the following rules:

\[
\text{Mla.} \quad \#e, i \quad \Downarrow \quad i \\
\text{Cl.} \quad (m, \eta)VCV- \quad \Downarrow \quad \emptyset
\]

Classes of symbols may be represented by cover symbols or by parentheses enclosing the elements of the class separated by commas. Within such a parenthesis an extra comma indicates that the whole class is optional. Parentheses enclosing a single elementary or cover symbol indicate that that symbol is optional. A bar over one or more symbols negate those symbols. A hyphen is used as an abbreviation for \( - \). Restrictions on the membership of a class represented by a cover symbol may be appended to each rule, e.g. "D ≠ y". The following are some examples of environment statements.

The formula \( C(V) \) stands for \( C \) or \( CV \).

The formula \( C(V, :) \) stands for \( CV \) or \( C:\).
The formula \(C(V,:)\) stands for \(C\) or \(CV\) or \(C:\\).
The formula \(CVCC\) stands for \(CV\) followed by anything but \(CC\).
The formula \(CV-\) stands for nonfinal \(CV\).

The cover symbols are these:

- \(C\): all consonants and semivowels, including glottalized ones.
- \(D\): dental and palatal consonants, including \(y\).
- \(B\): bilabial consonants, including \(w\).
- \(V\): all vowels (long vowels are not included. Length must be indicated separately, with the length mark, "\(::\).")

\(\emptyset\) is not a morphophoneme or phoneme. It is used simply to indicate the absence of any phoneme or morphophoneme at a given position.

In other than its "official" statement, such as in the rule index (VII.), a rule may be written in a condensed, linear, notation in which the replacement specification is rotated up into the alignment of the rest of the rule and enclosed in parentheses. The arrow is replaced by the \(>\) sign, and the \(\emptyset\) is not written. The rules shown above would appear in the linear notation as follows:

- \(Fla\): \(V(:)C(V ::)\)
- \(Mla\): \(#C(> i)C(e, i)\)
- \(Cl\): \((m, \eta)(V ::)CV-\)
A. V + V rules.

There are no vowel clusters on the phonemic level. Whenever two morphophonemic vowels come together, either they are converted into a single vowel (with or without length) by these rules or a semivowel appears by the later action of rules L. Some sequences of V + semivowel are also converted by these rules.

\[
\begin{array}{c}
a_i-

downarrow

e:
\end{array}
\]

Examples:

\[
\begin{array}{lcl}
\text{ka i no:no} & > & \text{ke:no:no} \\
(\text{past}) & (3.\text{sg}) & "\text{swim}" & "\text{he swam}"
\end{array}
\]

\[
\begin{array}{lcl}
\text{fai} & \eta & > & \text{fe:}\eta \\
"\text{find}" & (\text{tr}) &"\text{find or pick up something}"
\end{array}
\]

\[
\begin{array}{lcl}
\text{ka i no:no} & > & \text{ke:no:no} \quad \text{(with Ela)} \\
(\text{past}) & (3.\text{sg}) & "\text{say}" & "\text{he said}"
\end{array}
\]

Order: Before Ela, before A3.

Further notes: Final position is excluded by the hyphen. In final position the i would become y, by rule L3a.
Examples:

A2

\[
\text{swy} \\
\downarrow \\
\ddots \\
o:
\]

"blow" (tr)

Order: Before L3.

A3

\[
\text{e:wy} \\
\downarrow \\
\ddots \\
o:
\]

Examples:

\[
\text{sai} \text{ w} \text{ eg:} \quad > \quad \text{so:we:g (with L2)} \\
\text{"split" (nom) (tr)} \quad \text{"split sthg"}
\]

\[
\text{ce:w} \text{ y} \quad > \quad \ddots \text{y} \\
\text{"scoop net" (tr)} \quad \text{"scoop up w. net"}
\]

Order: After A1, before L2.

A4

\[
\text{qiy} \\
\downarrow \\
\ddots \\
o:
\]

Example:

\[
\text{qoloi} \text{ y} \quad > \quad \ddots \text{y} \\
\text{"peel" (tr)} \quad \text{"peel something"}
\]

Order: Before Qla (which umlauts the first o in the above example).
Example: \( ku \quad i \quad nöːŋ > ki:nöːŋ \)

"also" (3.sg) "swim" "he also swam"
B. Two early vowel assimilation rules.

One of the most frequent alternations involves the lowering of e to ə by a neighboring low vowel, as will be described by rules E. However there is a clear set of instances in which a basic e is not lowered by a neighboring ə (which is a low vowel). Instead, the neighboring ə is raised to e. These cases all involve roots of the shape Cə:C before the transitive suffix -e:g, as in the example /cəːl, ceːleːɡ/ "turn around".

It seems simpler to regard cəːl rather than ceːl as basic because the latter alternative would require an apparently unmotivated lowering of e to ə in the unsuffixed form. The rule Bl raises the basic ə to e next to e. The rule must apply before rules E have an opportunity to lower the e of the suffix. Otherwise the transitive form of the above example, for instance, would turn out to be */cəːleːɡ/.

Bl

\[
\begin{array}{c}
\text{aCCeːCe} \\
\downarrow \\
e
\end{array}
\]

Examples:

- cəːl  
  "turn around"  
  eg:  
  > ceːleːɡ

- leːp  
  "twist"  
  eg:  
  > leːpeːɡ

- seːr  
  "scrape bottom"  
  eg:  
  > seːreːɡ

- "turn sthg around"  
- "twist sthg"
- "run (boat) aground"
Order: Before E.

Further notes: The exclusion in the left environment is to account for the failure of the a in /gargeːl/ "born" to be raised in the transitive /gargeːləːg/ "to bear".

B2
gu

sporadically

Example:

ka gu noːŋ > kogoːŋ ~ kagnoːŋ
(past) (1.ex) "swim" "I swam"

ka qa gu noːŋ > koqoŋnoːŋ ~ kaqagnɔːŋ
(past) (perf) (1.ex) "swim" "I had swum"

Order: Before Flb.

Further notes: This rule finds application only with the tense and person prefixes in the above constructions. Even with these it is only sporadically applied, with some informants being more inclined to use it than others. A more general form of this rule occurs later (J5), and that rule is not subject to oscillation or dialect variation. By then the conditions of this rule will have been destroyed by rules F.
C. Dropping of short vowel in initial syllable.

Short vowels in initial syllables between certain pairs of homorganic consonants must be dropped here, before rules F, to simplify the left environment in rule F1b. Another set of rules (N) for dropping short vowels will be encountered later. The pairs of consonants that concern us here are those in which the first member is a nasal and the second is homorganic with it. Actually only the pairs in which the first is m or η need be specified.

Cl. \[(m, η)VCV- \rightarrow \emptyset\] C is homorganic with m or η respectively.

Examples: ma > mbug (nom) "bend" "bent"
ηa gu luk > ηguluk (incep) (1.ex) "bathe" "I'll wash"

Order: Before F.
D. Lightening of a.

There are frequent alternations of ā, especially āː, with a. In most cases it is possible to consider the a as basic, with ā being derived from it by the following rules. Recall that ā occurs only next to dental or palatal consonants. The conditioning environments in these rules all contain such consonants.

\[
\begin{array}{c}
\text{Dla} \\
\text{sD(i,u)\#} \\
\downarrow \\
\dd \\
\hat{a}
\end{array}
\quad \text{D \neq y}
\]

Examples:
- dal'u > dā:1' (with F) "penis"
- qadi > qā:d (with F) "liver"
- qaru > qā:r (with F) "to stir"
- ma ni > mā:n (with F) (nom) "close" "closed"

Order: Before F.

Further notes: Y is excluded from the environment because, e.g., //dayi#// > /da:y/, not */dā:y/ "sea". The final i in the basic form is required by /dayi:g/ "my sea". Similarly //qayi//, "leg", > /qa:y, qayi:g/.
Db
\[(u,\ddot{o},i)(::)DaC\]
\[\downarrow\]
\[\ddot{a}\]

Examples: wula \(g:\) \(>\) wula\(^{\ddot{u}}\)g (with F)
"feather" (1.sg) "my feather"
miza \(g:\) \(>\) miza\(^{\ddot{u}}\)g (with F)
"hide" (tr) "hide it"
binawa \(>\) bin\(^{\ddot{u}}\)w (with F)
"village"

Order: Before F2.

Further notes: Long a: would be immune to this lightening. There exist a:'s in this environment, e.g. /fina:z/ "spin, weave". Hence this rule must be applied before rules F2 can lengthen the a in the above examples.

Dlc
\[yaD\]
\[\downarrow\]
\[\ddot{a}\]

Example: ya \(d:\) \(>\) ya\(^{\ddot{a}}\)d (with F)
(3.) (pl) "they"

Order: Before F2.

Further notes: The previous note applies to this rule as well. There are long a:'s in this environment, e.g. /fiya:z/ "dust".
E. Lowering of e.

The lowering of e to ₋ by a neighboring low vowel must be done here before F. These rules are not consistently observed by some informants when a break larger than a morpheme boundary (e.g. word boundary) intervenes in the environment. For instance, /rogon e: marwe:l/ varies with /rogon ₋: marwe:l/ "method of work, how to work". In such cases there is frequently not only oscillation but also blending between e and ₋.

Ela

\[ e(:)C(o,e,\ddot{e}) \]

\[ \downarrow \]

\[ \ddot{e} \]

Apply retrogressively through word.

Examples:

ka ra faigad: \> karfe:ga:d
(past) (3.) "find" (i.m.) (pl) "they were gathering"

ki:l e na \> kile:n
"keel" (a.c.) (3.sg) "keel of, its keel"

ka i ba \> ke:b
(past) (3.sg) "come" "he came"
Elb

\[(a, o, e, â)(:)(C)CeC\]
\[\downarrow\]
\[e\]

Example:

câːf  eg:  >  căːfeːg

"turn away"  (tr)  "turn (car, etc.) off (road, etc.)"

Order: Before F, since long e: must escape this lowering.

Elc

\[(a, o, e, â)(:)(C(V, :))CeC\]
\[\downarrow\]
\[e\]

Example:

m'ora  e  g:  >  m'areːg

"vehicle"  (a.c.)  (1.sg)  "my vehicle"

Order: Before F.
F. Morpheme-final //:// and short vowels.

One of the most prevalent morphophonemic alternations is that between long and short vowels in final closed and nonfinal syllables respectively. All eight vowels participate in this alternation, though examples for some vowels are much more plentiful than others. Some examples are given here.

\[
\begin{align*}
\text{i:/i} & \quad \text{carry liquids/they carried liquids} & \text{l'i:ŋ} & \text{karl'ine:d} \\
& \text{run/run with sthg} & \text{mi:l} & \text{mile:g} \\
\text{e:/a} & \quad \text{pull/they pulled} & \text{te:l} & \text{kartale:d} \\
\text{eː:/a} & \quad \text{good, well/to fix sthg} & \text{feː:l} & \text{fal'eː:g} \\
& \text{basket/his fishing basket} & \text{ceː:l} & \text{calė:n} \\
\text{eːː:/i} & \quad \text{scrape (durian) seed/they...} & \text{nāːf} & \text{karnife:d} \\
& \text{hide/they hid sthg} & \text{zaː:g} & \text{kartzige:d} \\
\text{eːː:/a} & \quad \text{release/they released sthg} & \text{paːg} & \text{karpage:d} \\
& \text{age/his age} & \text{yaŋaːr} & \text{yaŋareː:n} \\
& \text{finding/find sthg} & \text{paːt} & \text{pateː:g} \\
\text{oːː:/a} & \quad \text{sleep/put to sleep} & \text{moːl} & \text{malėː:g} \\
& \text{relationship/its relationship} & \text{yoːl} & \text{yaleː:n} \\
\text{oːː:/u} & \quad \text{send on an errand/they sent...} & \text{l'oː:g} & \text{karl'uge:d} \\
\text{uːː:/u} & \quad \text{bounce back/bounce something back} & \text{faːːsuo:1} & \text{fa:suleː:g} \\
& \text{untie/they untied sthg} & \text{puːf} & \text{karpufe:d}
\end{align*}
\]

This alternation cannot be treated as the automatic lengthening in final syllable of a basically short vowel, since short vowels, indeed all eight of them, do occur in final syllables, though with much less frequency than do long vowels. Such short
vowels alternate with short vowels in nonfinal syllables. Here follow some examples of the eight short vowels in final syllables, together with examples of their alternations:

\[
\begin{array}{lll}
\text{i/i} & \text{hair/my hair} & \text{piy} \\
& \text{leaning/lean sthg} & \text{zig} \\
\text{e/i} & \text{hang/they hung sthg} & \text{zeq} \\
& \text{get bumped or struck/bump something} & \text{pardeeq} \\
\text{a/a} & \text{enough/fill up or complete sthg} & \text{gaman} \\
& \text{afraid/scare someone} & \text{magar} \\
\text{o/a} & \text{blood/his blood} & \text{rcaq} \\
& \text{unwholesome/make sick} & \text{sagaloq} \\
& \text{result of doing/his doing} & \text{ŋoŋol} \\
\text{o/u} & \text{skull/my skull} & \text{loq} \\
& \text{short sharp noise/make such sound} & \text{cub} \\
\text{u/u} & \text{bend/bend sthg} & \text{bug} \\
\end{array}
\]

Nor can the long/short alternation be considered as an automatic shortening in nonfinal syllable of a basically long vowel, since long vowels do occur in nonfinal syllables. In fact, there are instances of long vowels in final syllables alternating with long vowels in nonfinal syllables. Here are some examples, for all eight long vowels:

\[
\begin{array}{lll}
\text{i/i:} & \text{bone/its bone} & \text{yiːl} \\
\text{e:/e:} & \text{rope on sail/pull on same} & \text{meːl} \\
\text{ēː/eː} & \text{twisting/twist it} & \text{lēːp} \\
& \text{hope for/they hoped for sthg} & \text{qazpēːg} \\
\end{array}
\]
Thus, in nonfinal syllables in morphemes there are long vowels and short vowels, but they do not alternate in length, as do some of the vowels in morpheme-final syllables.

One of the methods adopted here to distinguish morphophonemically the long/short alternation from the other two types is as follows. Rather than invent eight new vowel morphophonemes, or even one new length morphophoneme, whose occurrence would be restricted to the final syllable of a morpheme, I will place the length symbol ":" after the consonant that closes a final syllable whose vowel undergoes the long/short alternation. Whenever the ":" occurs at the end of a phonological word after a consonant, and if the preceding vowel is not already long, the following two rules, applied in order, will metathesize the ":" with the consonant. Nonfinally (e.g., when there is a following suffix) the post-consonantal ":" simply drops, by the action of the second rule alone. In all other situations, namely after a vowel, the length mark remains, and is not mentioned in these rules.
As an illustration of the effect of these rules, consider the root meaning "run" used in one of the above examples. It would be written, morphophonemically, //mil:// and the independent and e:g-transitive forms would be derived by the rules as follows:

\[
\begin{array}{c|c|c}
\text{mil:} & \text{mil: e:g} \\
\hline
\text{F2} & \phi & \phi \\
\text{F3} & \phi & \phi \\
\end{array}
\]

\[
\text{mi:l} \quad \text{mile:g}
\]

Those morphemes with the long/long vowel alternation would simply have the length mark following the vowel in the usual way, thus escaping the application of these rules, while the vowel in short/short alternations would be written without any length mark. For comparison, examples of the three types of alternation, with their morphophonemic base forms, are arrayed here:

\[
\begin{array}{l|l|l|l}
\text{"twist"} & \text{le:p} & \text{le:p} & \text{le:pe:g} \\
\text{"run"} & \text{mil:} & \text{mi:l} & \text{mile:g} \\
\text{"make a noise"} & \text{cub} & \text{cub} & \text{cube:g} \\
\end{array}
\]
Vowels in the final syllable of these three types of base forms will be called "inherently long", "variable (in) length", and "inherently short", vowels, respectively.

In the above sets of examples the relevant instances of nonfinal syllables were all open syllables. For instance in /mile:g/ the i is in an open syllable. However the operation of the rule that drops ":" is not restricted to the environment before vowel. For instance, before the causative suffix -nag: in close phonological juncture we get

/mil: nag:/: > /milna:g/

Since such examples are much rarer in the morphology I consistently used examples of the other kind.

However, the only known minimal pair for the final //:// rarely occurs before vowels. The pair is

"level, layer" //zâl://
"wrestling" //zâ:l://

They do not occur before any vowel-initial suffixes. Nor do they normally occur before the same consonant-initial suffixes. It is however possible, with some unnaturalness, to place them in other identical environments before consonant in close juncture, so that the two kinds of alternations appear in relief:

"layer/that layer" /zâ:l/ /zâlne:m/
"wrestling/that wrestling /zâ:l/ /zâ:lne:m/
Final morphophonemic short vowels.

If the final "::" morphophoneme is regarded as in some sense equivalent to a vowel, the rule about its dropping with concomitant lengthening of the previous vowel is reminiscent of the phenomenon of "compensatory doubling" in Trukese as described by Dyen (and by others more recently in unpublished writings), although in Trukese it is only vowels in monosyllables that undergo this augmentation (Dyen, 1948).

For many morphemes in Yapese a final vowel (rather than :) must indeed be postulated for the morphophonemic base form in order to simplify the description of certain paradigms in which these morphemes occur. Such a vowel is known as a stem vowel (Dyen's term). The paradigms are the attributive paradigms (IV.2) and some of the transitivizing constructions (IV.3). The three major vowels occur most frequently as stem vowels: i, u, a. The vowel e occurs as a stem vowel in three or four cases in each idiolect.

These vowels remain intact only when followed by final C, C::, or CV, that is, before C(::V,)#, or when in an initial syllable before consonant. Finally the stem vowels behave like final "::", i.e., they drop while lengthening the previous vowel. In all other situations they simply drop (without compensatory lengthening). Rule Fla, performed before F2, assures the similarity of behavior of final V and final //://:

Fia. \[ V(::)CV# \]

\[ : \]
The following rules drop the stem vowel in the "all other situations" mentioned above:

\[
\begin{array}{c}
\text{Flb.} \quad V(:)V|CV(:)C \\
\downarrow \\
\emptyset \\
\end{array} \quad \begin{array}{c}
\text{Flc.} \quad -CV|V- \\
\downarrow \\
\emptyset \\
\end{array}
\]

In the few cases where there are successive morphemes all of the shape CV, it must be further specified that these rules be applied retrogressively (from right to left) in the word.

These rules apply not only to final short vowels of stems but also to final vowels of all other morphemes, including those of prefixes and suffixes, as will be seen in the examples given later. The rules are given now in their official statement:
Order: Fla before F2 before F3.
Examples: These examples show the rules operating on prefixes, roots, and suffixes. The failure of any F rules to operate (due to failure of environmental conditions) is also illustrated.

(past) (l.ex) "swim"

\[
\begin{array}{c}
\text{ka} \\
\text{o} \\
\text{B2} \\
\text{F1b} \\
\text{ko} \\
\end{array}
\]
\[
\begin{array}{c}
g \\
\varnothing \\
\eta \\
\text{Cl} \\
\eta \\
\end{array}
\]
\[
\begin{array}{c}
o:n = kogu:o:n \\
\end{array}
\]

(incep) (l.ex) "swim"

\[
\begin{array}{c}
\eta a \\
\varnothing \\
\text{Cl} \\
\eta \\
\end{array}
\]
\[
\begin{array}{c}
gu \\
\eta guno:o:n \\
\end{array}
\]

(past) (l.ex) "come"

\[
\begin{array}{c}
\text{ka} \\
\text{o} \\
\text{B2} \\
\text{F3} \\
\text{ko} \\
\end{array}
\]
\[
\begin{array}{c}
gu \\
\varnothing \\
\text{F2} \\
\text{F3} \\
\text{ko} \\
\end{array}
\]
\[
\begin{array}{c}
: b = kogu:b \\
\end{array}
\]
In some idiolects the above root takes the attributive classifier /e/ in the attributive construction:

\[ \text{luba} e g: \]

\[ F1b \quad \emptyset \]
\[ F2 \quad : \]
\[ F3 \quad \emptyset \]

\[ \text{lube:}g \]

\[ (\text{l.}in) \quad (\text{pl}) \]
\[ \text{luba} da d: \]

\[ F1b \quad \emptyset \]
\[ F2 \quad : \]
\[ F3 \quad \emptyset \]

\[ \text{lubda:}d \]
G. Reduction of contrast.

Since there are fewer short vowel contrasts in nonfinal (especially open) syllables than in final closed syllables (II.7c), certain vowels in the latter position alternate with vowels of a reduced set in the former position. In final closed syllables many occurrences of /ë/ and /ã/ can be considered as derived from basic /eː/ and /aː/ respectively (rules D, E), with which they alternate, but the occurrences of e, o, and ō, and of some of ĕ and ē have, for the most part, to be taken as basic, being reduced to a, u, i (in various combinations) in nonfinal syllables. The following rules perform these reductions.

In some words because the short vowel in open syllable tends to be extremely short and its quality obscure and prone to blending and oscillation, there may be some doubt as to its quality. Such is especially the case for the reduced reflexes of ā and ē in certain words (rules G3 and G4).

Most of the rules must not be applied before F.

\[
\text{Gla} \quad \begin{array}{c}
\text{eq}(y,i) \\
\downarrow \\
i
\end{array}
\]

Examples: pardeq y > pardiqi y (with H)
"bump, hit" (tr)

geqi g: > giqi:g
"anus" (1.sg) "my anus"
Order: Before H, before Glc.

Further notes: The rule must not be applied before Fla, so that the e in the independent form of //geqi// "anus", for instance, escapes its effect: The independent form is /ge:q/.

\[ \begin{array}{c}
\text{Glb} \\
\text{ewV} \\
\Downarrow \\
u \\
\end{array} \]

Examples: cewa g: \quad \rightarrow \quad cuwa:g
"net" \quad (1.sg) \quad "my net"

Order: Before Glc, after Fla, to spare the e of the independent form of the above example: /ce:w/.

\[ \begin{array}{c}
\text{Glc} \\
\text{e(C)CV} \\
\Downarrow \\
a \\
\end{array} \]

Examples: nife\ñi g: \quad \rightarrow \quad nif\ñi:g \quad \text{(with F)}
"wind" \quad (1.sg) \quad "my wind"

\[ \begin{array}{c}
\text{Gld} \\
\text{e(C)CV} \\
\Downarrow \\
a \\
\end{array} \]

Examples:
\text{cel}: \quad \quad e \quad g: \quad \rightarrow \quad cale\ñ:g
"fishing basket" \quad (a.c.) \quad (1.sg) \quad "my fishing basket"
\text{fèl}: \quad \quad eg: \quad \rightarrow \quad fale\ñ:eg
"good, well" \quad (tr) \quad "fix"
fel':      R1       >  fal'afe:l'
"good, well"  (redup)       "pretty"

Order: After F

\[
\begin{array}{c}
\text{CoCV} \\
V \neq o, u, \ddot{\text{o}} \\
\downarrow \\
C \neq w \\
a
\end{array}
\]

Examples: k'ona  g:  >  k'ana:g
"throat"  (1.sg)       "my throat"

goza  y  >  gazay
"abuse, waste"  (tr)       "waste sthg"

Order: After F, to preserve the o in the independent form of e.g.,
\text{/k'ona/}  \neq  \text{/k'o:na/}.

Further notes: This rule seems to be suspended in a few words,
e.g., \text{/qod eg/}  \neq  \text{/qode:og/}, not \text{*/qade:og/} "wake somebody up".
See II.7c for other examples.

\[
\begin{array}{c}
\ddot{\text{oCe}} \\
\downarrow \\
a
\end{array}
\]

Examples: qupa\ddot{\text{q}}:  e  na  >  qupa\ddot{\text{q}}:\text{n}
"cover"  (a.c.)  (3.sg)       "its cover"

qupa\ddot{\text{q}}:l:  e  na  >  qupa\ddot{\text{l}}:\text{n}
"noose"  (a.c.)  (3.sg)       "its noose"

Order: Before G3b, after E.
G3b

\[ \text{CV} \]
\[ \downarrow \]
\[ u \]

Examples:

\[ \text{g:} \quad > \quad \text{quŋu:}g \]

"grass skirt" (l.sg) "my grass skirt"

- \[ \text{kož:} \]
  
  e: \quad d: \quad > \quad \text{-kuze:d}

"touch sthg sticky" (t.m.) (pl) "they, we, etc. got dirty"

Order: After F, to preserve the \[ \text{o} \] in the uninflected forms.

G4a

\[ \text{waCV} \]
\[ \downarrow \]
\[ u \]

Example: \[ \text{wan'u} \quad g: \quad > \quad \text{wun'u:}g \]

"opinion" (l.sg) "my opinion"

Order: After F, to preserve the \[ \text{á} \] in the uninflected forms.

Before G4b.
Examples:

ka ra fäl: e: d: > karfile:d
(past) (3.) "open" (t.m.) (pl) "they opened it"

ka ra l'āŋ: e: d: > karl'inge:d
(past) (3.) "weave" (t.m.) (pl) "they wove it"

Order: After F.

G4c

Sporadically in a few words.

Example: maːman y > maːmaniy
"paddle" (tr) "paddle it"

H. Excrecent vowels in final clusters.

The motivation for treating certain short vowels in final syllables as excrecent, i.e., as arising predictably in what is basically a final cluster of consonants (-CC# > -CVC#) comes from the attributive paradigms with short stem vowel (IV.2) and from those transitive paradigms in -y whose stem vowel, i, cannot be considered as being present in the basic form of the stem (IV.3).

The quality of the vowel depends on that of the vowel before the preceding consonant, if there is one. If another consonant immediately precedes that consonant, then the quality is taken from the following consonant, which is, in all such cases, y (rule H6, below.)

These rules must come after rules F have already been applied. Otherwise in many cases the excrecent vowel would undergo compensatory lengthening by rules F.

\[
\begin{array}{ccc}
\text{Hla} & \text{u(\text{C}_1 \text{B}_y\text{C}_1 \neq \text{w})} \\
\downarrow & \text{u} \\
\text{Examples:} & \text{bug} & y \quad > \quad \text{buguy} \\
& "bend" & (\text{tr}) \quad "\text{bend sthg}" \\
& \text{gurf} \quad > \quad \text{guruf} \\
& "\text{stir}" \\
\text{Order:} & \text{After F.}
\end{array}
\]
H1b
\[
\begin{array}{c}
\text{u(} \cdot \text{C}_1 \text{ C}_2 \# \\
\downarrow \text{o}
\end{array}
\]
\[C_1 = w \text{ or } C_2 \neq B, y\]

Examples:

suw \quad y \quad > \quad suwoy

"jurisdiction" (impers) \quad "somebody's jurisdiction"

ruwl \quad > \quad ruwoi

"fish-herding rope"

ma \quad gucz \quad > \quad mogocoz \quad (with J3,5)
(nom) \quad "tear" \quad "torn"

Order: After F.

H3
\[
\begin{array}{c}
\text{o(} \cdot \text{C C} \# \\
\downarrow \text{o}
\end{array}
\]

Examples: 

rog \quad g: \quad > \quad rogog

"welfare" (1.sg) \quad "my welfare"

go:np' \quad > \quad go:np'

"deliberation"

Order: After F.
Example: gös  g:  > gösög
"handiwork"  (l.sg)  "my doing"

Order: After F.

Examples: gas  g:  > gasag
"trespass"  (l.sg)  "my mistake"

ma  k'ar ŋ  > mak'arəŋ
(nom) "tease"  (tr)  "spoiling (for fight)"

darawq  > darawoq  (with J)
"feed"

Order: After F, before Jl.

Examples: ma:man  y  > ma:maniy
"paddle"  (tr)  "paddle it"

fireg  y  > firgiy
"search in a pile"  (tr)  "search through"
me:l y > me:liy

"rope to sail" (tr) "pull on such rope"

re:f y > re:fiy

"rub smooth" (tr) "rub sth smooth"

ci:f y > ci:fiy

"turn away" (tr) "turn (a vehicle) off (road)"

Examples:

gurf y > gurfiy

"stir" (tr) "stir it"

gucz y > gucziy

"tear" (tr) "tear it"

go:npi y > go:npiiy

"deliberation" (tr) "arrange (an affair)"

Order: After F.
J. Vowel assimilation.

This set of rules describes certain assimilations and partial assimilations of vowels separated by members of a small class of consonants.

\[
\begin{array}{c}
\text{J1} \\
\uparrow \\
uq\text{i} \\
i \\
\end{array}
\]

Example:
ku qu i no:ŋ > kiqi:no:ŋ
(past) (imperf) (3.sg) "swim" "he used to swim" (with A5)
Order: After A5.

\[
\begin{array}{c}
\text{J2a} \\
\uparrow \\
aqe \\
e \\
\end{array}
\]

Example:
ka qa i no:ŋ > keqe:no:ŋ
(past) (perf) (3.sg) "swim" "he had swum"

\[
\begin{array}{c}
\text{J2b} \\
\uparrow \\
aq\text{e} \\
\text{e} \\
\end{array}
\]

Example:
ka qa i no:no > keqe:no:n
(past) (perf) (3.sg) "talk" "he had talked"

J2c

Example: mat'awa  
g:  > mat'owa:g
"right"  (1.sg) "my right"

Order: After F.

J3

C = stop or glottalized consonant

Examples:

ma  ko:l  >  moko:l
(nom) "catch"  "a catch"

ma  1'o:g  >  mol'o:g  (with J5)
(nom) "step off"  "step off"

ma  qe:w  g:  >  moqo:g  (with A3, J5)
(nom) "pole"  (tr) "poling down fruit"

Order: After A3, before J5.

J4

Examples: see next rule.

Order: Before J5.
Further notes: The "_" in the environment is to prevent the rule (and the following rule) from effecting those simple morphemes that have the sequence /aqu/, such as /naqu/ "house".

Where at least one of the indicated morpheme boundaries is present. C' is a cover symbol for glottalized consonants.

Examples: ma qoloi > moqoloy  
(nom) "peel"  "peeling"

ma gucz > mogocoz  (with Hlb)  
(nom) "tear"  "torn"

ma qurf > moqoruf  (with Hla)  
(nom) "burn"  "burnt"

Order: After Hla.
K. Dropping of y and w.

Many words which end in y or w lose this semivowel before a following consonant in close phonological juncture. Accompanying this loss are a lengthening of the preceding vowel if it was not already long, and, with some vowels, a change of quality. Final semivowels in other morphemes however do not drop in this position. The contrasting alternations are shown by these pairs of examples:

<table>
<thead>
<tr>
<th>English</th>
<th>Pasifik</th>
<th>Pasifik</th>
</tr>
</thead>
<tbody>
<tr>
<td>cnut tree</td>
<td>ni:w</td>
<td>ni:ne:m</td>
</tr>
<tr>
<td>mangrove (?)</td>
<td>ri:w</td>
<td>ri:wen:m</td>
</tr>
<tr>
<td>half / that half</td>
<td>balay</td>
<td>bale:ne:m</td>
</tr>
<tr>
<td>vine / that vine</td>
<td>yalay</td>
<td>yalayne:m</td>
</tr>
<tr>
<td>basket / that basket</td>
<td>wa:y</td>
<td>wa:ne:m</td>
</tr>
<tr>
<td>whale / that whale</td>
<td>ra:y</td>
<td>ra:yn:e:m</td>
</tr>
</tbody>
</table>

These alternations show considerable variation between informants. That is, for a given word one informant may drop the semivowel but another may retain it. Furthermore, within each idiolect certain such words may oscillate from one pattern to the other. For instance, /k'a:y/ "octopus" may either drop or not drop its y before a consonant, in T's idiolect. However within each idiolect there is a reliable corpus of words which do not oscillate in this respect, so that the two patterns are not a matter of free variation, but must be described as contrasting.

These two types of alternation are differentiated morphophonemically by ascribing those semivowels that drop to basic
y's and w's, but those that remain, to basic i's and u's. The rules in this section drop the basic y's and w's before consonant and lengthen the preceding vowel where appropriate, while the rules of the following section (L) perform the semivocalization of these (as well as other) basic i's and u's.

The rules K must of course precede rules L because otherwise the y's and w's which resulted from rules L would be dropped by rules K along with the basic y's and w's. Nor should the rules N, which drop short vowels between a semivowel and a consonant, be applied before rules K since the semivowels in this situation are not to be lost.

**K1**

\[
\begin{array}{c}
ayC \\
\downarrow \\
e  
\end{array}
\]

**Order:** Before K2a, after F.

**K2a**

\[
\begin{array}{c}
V(y,w)C \\
\downarrow \\
\emptyset 
\end{array}
\]

**Order:** Before L, N.

**Examples:**

- **binawa**
- **ro:**
- **g:**
- **bina:ro:ɡ**
- "village"
- (poss)
- (1.sg)
- "my village"
<table>
<thead>
<tr>
<th>English</th>
<th>Pidgin</th>
<th>Meanings</th>
<th>(with K2a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;frond&quot;</td>
<td>&quot;that&quot;</td>
<td>&quot;that frond&quot;</td>
<td></td>
</tr>
<tr>
<td>bre:y</td>
<td>ro:</td>
<td>g:</td>
<td>bre:ro:g</td>
</tr>
<tr>
<td>&quot;hill&quot;</td>
<td>(poss)</td>
<td>(1.sg)</td>
<td>&quot;my hill&quot;</td>
</tr>
<tr>
<td>niwa</td>
<td>ro:</td>
<td>g:</td>
<td>ni:ro:g</td>
</tr>
<tr>
<td>&quot;cnut&quot;</td>
<td>(poss)</td>
<td>(1.sg)</td>
<td>&quot;my cnut (tree)&quot;</td>
</tr>
<tr>
<td>zaw</td>
<td>nag:</td>
<td></td>
<td>zo:na:g</td>
</tr>
<tr>
<td>&quot;swell&quot;</td>
<td>(caus)</td>
<td></td>
<td>&quot;make sthg swell up&quot;</td>
</tr>
</tbody>
</table>
L. Development of y and w.

There are no initial vowels or sequences of vowels on the phonemic level. If an initial vowel or a vowel cluster has survived the rules thus far, the following rules will insert a y or w or replace a basic i or u with a y or w.

Lla

\[
\begin{array}{c}
\text{#i(ō,i)} \\
\text{y}
\end{array}
\]

Examples: i ō:n' > yō:n'

(3.sg) "throw"    "he throws"

Order: Before Llb.

Llb

\[
\begin{array}{c}
\text{(#,i,e)(;)(i,ā,ō)} \\
y
\end{array}
\]

Examples: gu be: ō:g > gube:yō:g

(1.ex) (prog) "say"    "I am saying"

ka i im'a > ke:yi:m'

(past) (3.sg) "die"    "he died"

ka i ā:n > ke:ya:n

(past) (3.sg) "go"    "he went"

ō:g > yō:g

"say"
\[ im'a > yi:m' \]

"die"


\[ (u, o, o)(i, e) \]
\[ \downarrow \]
\[ w \]

Examples: sai      w      e:g  >  so:we:g
           "split"   (nom)  (tr)  "split sthg"

c:we:w      e:g:      >  co:we:g
           "scoop net"  (tr)  "scoop it up"

Order: After A3.

\[ V(:)i(C, #) \]
\[ \downarrow \]
\[ y \]

Examples:  fa:i  >  fay
           "find"

ra:i  >  ra:y
           "whale"

qayu:i  nêm:  >  qayu:yne:m
           "cnut crab"  "that"  "that cnut crab"

Order: After K1, A1.
Example: n'e:u
"wave"
ri:u
"mangrove(?)"

Order: After A3, so that the e:w's resulting from this rule are not further converted to o: by A3.
M. Excessive vowels in nonfinal clusters.

Certain pairs of consonants do not occur phonemically in clusters. When they arise in morphemes or sequences of morphemes, short vowels are inserted by morphophonemic rules. Rules H inserted excessive vowels in final consonant clusters. The rules of this section insert vowels in initial and medial clusters. In initial clusters the vowel is determined by the following vowel; in medial clusters, by the preceding vowel.

M1a

\[ \text{\#C C(e,i)} \]

\[ \downarrow \]

\[ \text{C's are not homorganic in all rules M1.} \]

M1b

\[ \text{\#C C(a,o)} \]

\[ \downarrow \]

\[ a \]

M1c

\[ \text{\#C Cö} \]

\[ \downarrow \]

\[ \ddot{o} \]

M1d

\[ \text{\#C Cu} \]

\[ \downarrow \]

\[ u \]
Examples:

m  ligil > miligil
(nom) "boil" "boiling"

(p.s.) (1.ex) (du) "he and I"

(g)  ma w > gamow
(p.s.) (2.) (du) "you two"

(m) qo:g > moqo:g
(2.sg) "jump" "jump!"

(m) qo:g > moqo:g
(2.sg) "shake down fruit with a pole"

(m) kun > mukun
(nom) "pierce" "pierced"
M2\[V_1C_1 \text{ } C_2^-\] \[\downarrow\] \[V_1\] \(C_1 = \) stop or glottalized consonant,
\(C_1, C_2 \) non-homorganic.

Examples:

- bac \( Rl \) \( > \) bacabac
- "coiled" (redup) \( "\text{coiled}"\)
- lub: \( Rl \) \( > \) lubulu:b
- "bubble" (redup) \( "\text{bubbling, bubbly}"\)
- qadi \( ma \text{ } w \) \( > \) qadamow
- "liver" (1.ex) (du) \( "\text{our (his and my) livers}"\)

Order: After F.
N. Loss of short vowels.

Between certain pairs of consonants short vowels are dropped. The set of initial consonant pairs in which this happens is more restricted than the set of medial pairs.

\[
\text{N1 } \quad \#(b,m,l,r,g,\eta)VC_2^- \quad \downarrow \quad \emptyset \quad C_2 \text{ is homorganic with the initial consonant. (Dentals and palatals are considered homorganic here.)}
\]

Examples:

mab: \quad e: \quad ma \quad bi \quad mbe:ma:b

"door" (particle) (nom) "open" "the door is open"

gu \quad ga:g \quad nag: \quad gga:gna:g

(l.sg) "turn boat (caus) "I'm turning it into into wind" the wind"

gag: \quad e: \quad gu \quad fe:k \quad gge:gufe:k

"I" (particle) (l.sg) "take" "It was I who took it"

\[
\text{N2 } \quad -V(:)C_1VC_2^- \quad \downarrow \quad \emptyset \quad \text{Apply retrogressively in word.}
\]

Conditions on \(C_1\) and \(C_2\):

1. \(C_1\) and \(C_2\) are the same homorganic pairs as in Rule N1,
2. \(C_1 = y,w,r,\)
3. \(C_1 \neq \text{stop or glottalized consonant, and } C_2 = y,w.\)
| Examples:  | g:    |  >  | binwa:g |
|           | g:    |  >  | t'iyu:gu g:  >  t'iyu:gu: | "village" |
|           | (1.sg) | "my village" |
|           | g:    |  >  | qala:ng: | "fingernail" |
| qala:ng:  | e     |  >  | qala:ng: |
|           | (a.c.) | (1.sg) | "my headache" |
| qalit     | e     |  >  | qalit: |
|           | (a.c.) | (3.sg) | "dirt of" |
| giren:    | y     |  >  | girniy |
| "pull"    | (tr)  |  >  | "pull sthg" |
| maruwel:  | y     |  >  | maru:le |
| "work"    | (tr)  |  >  | "work on something" |
| nucey     | e     |  >  | nucye: | "vein" |
|           | (a.c.) | (1.sg) | "my vein" |
| - to:lul: | ga    |  >  | -to:llga: |
| "dive"    | (i.m.) | (pl)  | "diving (pl)" |

Order: After K.
P. Consonant assimilation.

Certain pairs of consonants, when put in contact with each other at morpheme boundaries or by the dropping of an intervening short vowel, assimilate to each other. There is considerable variability however, from speaker to speaker and from time to time. One factor which influences the assimilation is the speed—the faster the speech the more likely the assimilation. The following rules summarize the assimilation that has been observed. These are the only rules that deal with consonant alternation.

\[
\begin{align*}
P1a & \quad d(t,t') \\
\downarrow t & \quad \uparrow t
\end{align*}
\]

\[
\begin{align*}
P1b & \quad d(z,z') \\
\downarrow z & \quad \uparrow z
\end{align*}
\]

\[
\begin{align*}
P1c & \quad dc \\
\downarrow c & \quad \uparrow c
\end{align*}
\]

\[
\begin{align*}
P1d & \quad ds \\
\downarrow s & \quad \uparrow s
\end{align*}
\]

\[
\begin{align*}
P2a & \quad nl \\
\downarrow l & \quad \uparrow l
\end{align*}
\]

\[
\begin{align*}
P2b & \quad nn\eta \\
\downarrow \emptyset & \quad \uparrow \emptyset
\end{align*}
\]

\[
\begin{align*}
P3 & \quad g(k,k') \\
\downarrow k & \quad \uparrow k
\end{align*}
\]

Order: After N.
Examples:

ŋa da ce:1 e:g > ṇacce:le:g-
(incep) (1.in) "turn" (tr) "we're going to turn it"

ka da tal ga w > kattalgow
(past) (1.in) "stop" (i.m.) (du) "we stopped"

piya na lō:lug e na > piyallō:lugē:n
"hair" (3.sg) "head" (a.c.) (3.sg) "hair on his head"

co:n ŋi g: > co:ŋi:g
"member" (a.c.) (1.sg) "my people"

ka gu k'iya g: > kokk'iya:g
(past) (1.ex) "straight" (1.sg) "I straightened it"
Q. Lightening of o.

These rules lighten o to ə when separated from a light vowel by a dental or palatal.

Example: qolo'i y > qolo:y (with A4) "peel" (tr) "peel sthg"

Order: After A4.

Examples:

wa:1 ro: g: > wa:1rəːːg
"boxfish" (poss) (l.sg) "my boxfish"

binawa ro: g: > binəːrəːːg
"village" (poss) (l.sg) "my village"

ka ra si:lo d: > karsi:loːːd
(past) (3.) "return" (pl) "they came back"

Order: After D2.
S. Raising of a: between dentals.

S1

\[ \text{D} \ddagger \text{D(D)V} \]

\[ e \]

Examples:

\[ z'i:a:b \]  \[ \text{R2} \]  \[ z'e:z'i:a:b \]

"sever (cut)"  (redup)  "all cut up"

\[ \ddagger a:r \]  \[ e:g \]  \[ de:re:g \]

"show"  (tr)  "show something"

\[ \text{fin} \ddagger a:z \]  \[ y \]  \[ \text{fine:ziy} \]

"spin (I)"  (tr)  "spin something"

(other dialects: \[ \text{fin} \ddagger a:z \])

\[ \ddagger y:a:r \]  \[ ro: \]  \[ g: \]  \[ ye:ro:g \]

"knife"  (poss)  (l.sg)  "my knife"
R. Reduplication.

Reduplication applies almost exclusively to roots. In a few cases derivational affixes are also involved, e.g.

\[
\text{//ma$_{\text{ni}}$/} \quad > \quad \text{/manma$_{\text{n}}$/} \\
\text{(nom) "close" "all closed"}
\]

\[
\text{//fa$_{\text{i}}$_{\text{n}}$/} \quad > \quad \text{/fe$\ddot{e}$fe$_{\text{g}}$/} \\
\text{"find" (tr) "going around picking up things"}
\]

(In quoting examples of reduplication, the portion of a form to be reduplicated is underlined.)

The apparently diverse types of reduplication may be seen more clearly in terms of two cross-cutting classifications. One classification is according to whether the reduplication precedes or follows the application of the other morphophonemic rules. Morphophonemic reduplication, Rm, applies to morphophonemic base forms, before the application of the other rules. Phonemic reduplication, Rp, applies to phonemic shapes, that is, applies after the morphophonemic rules have been applied. An example of Rm is

\[
\text{//sa$_{\text{i}}$ w eg:$/} \quad > \quad \text{/se$\ddot{o}$we$_{\text{g}}$/} \quad \text{(A1, A3, F)} \\
\text{"split" (nom) (tr) "chop up into slivers"}
\]

An example of Rp is

\[
\text{//pe$_{\text{i}}$1 e:$/} \quad > \quad \text{/pe$\ddot{e}$le$_{\text{g}}$/} \quad > \quad \text{/pe$_{\text{1}}$pe$\ddot{e}$le$_{\text{g}}$/} \quad \text{(B1)} \\
\text{"half-visible" (tr) "intermittently hide"}
\]
Exchanging the types on these two examples would give

\[ */\text{so:so:we:}g/ \quad \text{and} \quad */\text{pe:lep:le:}g/ \quad \text{respectively.} \]

Many forms are ambiguous with respect to this classification, that is, could be the result of either Rm or Rp. Thus for example, \( /\text{ce:ge:}g/ \) could be from \( /\text{ce:}g/ \) "stick together" by either Rm or Rp since the morphophonemic rules make no change at all in the basic form. Similarly, \( /\text{se:se:y}/ \) could be from \( /\text{se:}y// \) by Rm or from \( /\text{se:}y/ \) by Rp. Such ambiguous reduplication will be symbolized by R.

Some roots can occur with either Rm or Rp, in company with different derivational material:

Rm \( /\text{mil: e:}g// \rightarrow /\text{milmile:}g/ \)

Rp \( /\text{mil:} // \rightarrow /\text{mil:} / \rightarrow /\text{mil:mile:}l/ \)

A few roots apparently can undergo a hybrid of these two kinds of reduplication. This kind of reduplication, Rh, occurs after certain, but before other, morphophonemic rules have been applied. For instance, in

\( /\text{z'ab:} // \rightarrow /\text{e:z'ab}/ \)

the reduplication appears to have occurred after rules F but before rules S:

\( z'\text{ab:} \rightarrow z'a:z'\text{ab} \rightarrow z'\text{a:z'ab} \rightarrow z'\text{e:z'ab} \)

F2 \quad Rh \quad S1

Similarly,

\( /\text{t'ari:} // \rightarrow /\text{t'e:t'ar}/ \)
In //ma bi// > /mbama:b/ reduplication seems to occur after Fla but before F2:

mabi > mab: > mab:mab: > mbama:b > mbama:b

F1a Rh F2,3 M2,NI

The form //z'ab:// also can be reduplicated with Rm, giving /z'abz'a:b/.

Oscillation and dialect variation between Rm and Rp occasionally occurs.

The other classification of reduplication is according to the shape and position of the segment which is repeated. The most frequently reduplicated portion is the initial CV(V,:)C of a form. Such reduplication will be symbolized by the digit "1" in the reduplication symbol. The most frequent type is Rm1, of which these are some examples that have already been given:

//qaru// > /qarqē:r/

//mil: e:g// > //milmile:g/

Among the examples already given, these illustrate Rpl:

//fai η// > /fei:n/ > /fe:ηfe:η/


//peːl e:g// > /peːle:g/ > /pe:le:le:g/

Initial CV(V,:) reduplication is indicated by the digit "2" in the reduplication symbol. Examples which are clearly Rm2 or Rp2 are rare; most are simply R2, being indifferent to the relative order of morphophonemic derivation and reduplication.
Examples:

//sa:lp// > /sa:sa:lap/

//ziqe:g// > /ziziqe:g/

An example of Rm2 is

//sai w eg:// > /se:sø:we:g/.

An example of Rp2 is

//taw y// > /tø:y/ > /tø:tø:y/

The word /tø:y/ also occurs with Rpl with the diminutive prefix s-: /stø:yto:y/.

The following is an example of oscillation between Rm2 and Rp2:

Rm2: //zaw// > /zo:zow/

Rp2: //zaw// > /zow/ > /zozow/

Reduplication of final CVC, R3, also occurs. There are no unambiguous cases of Rm3, and only a few of Rp3. Examples of the latter are:

//ma gucz// > /mogocoz/ > /mogocozcoz/

//qacyu// > /qacyu/ > /qacyucuy/

Some other examples of R3 are the following:

//qazib// > /qazibzib/

//sabzar// > /sabzarzar/

//ma qazuk// > /maqazukzuk/

The latter root also occurs in the unique example of another type of reduplication, of internal CV:

//qazuk y// > /qazuzukuy/
To summarize, there are many different apparent kinds of reduplication, which may be classified according to the order of occurrence of reduplication relative to the application of the morphophonemic rules, and according to the shape and position of the segment that is repeated. The majority of reduplication however is insensitive to the order of occurrence, and involves the repetition of the initial CV(V,;:)C portion of the form. The symbol for this type is R1. A number of roots may occur with more than one type of reduplication, either in dialect variation, oscillation, or with different derivational material.
Summary of morphophonemics.

Almost all of the morphophonemic alternations occur between vowels. The environmental conditions of these alternations are also more frequently vocalic than consonantal. Another important class of environmental determinants is syllabic and junctural (e.g., "nonfinal syllable," or "before morpheme boundary"). More than half of the 28 possible pairs of alternations between the 8 vowels occur, and they are accounted for by the above set of ordered rules.

No new segmental symbols are introduced on the morphophonemic level except for junctural symbols for morpheme boundary and morphological and phonological word boundaries. The distribution of the three major vowels and of the length symbol is extended to include morpheme final position after consonant. The distribution of two of the already rare minor vowels, ė and ě, is reduced, though not completely eliminated.

The rules vary greatly in productivity and generality. Perhaps the most productive and general rules are the rules F concerning morpheme-final vowels and //:// since they concern a whole class of morphophonemes in a very general environment. At the other end of the spectrum there are rules such as G1a and J2b relating to one vowel in a very special morphophonemic context. However some of these more specialized rules, such as rules E, are applied very frequently because of the prevalence of just those special conditions.
IV.0 Morphology: Introduction

This chapter describes most of the morphological constructions of not longer than a morphological word. While it is not a complete morphology, those constructions described illustrate all of the morphophonemics described in the previous chapter. Those constructions which are either not mentioned or mentioned only in passing, such as some involving "predicative" prefixation of verbs, are either not productive of morphophonemic phenomena or contain alternations already amply illustrated in the morphology that is included. This chapter should therefore be considered as a complement to the chapter on morphophonemics in providing examples and justification for the morphophonemic analysis.

The view of the morphology is therefore from "below," with little attention being paid to the syntactical possibilities of the units described or to distribution classes. Thus, for instance, even though directional words and certain kin terms have different distributional properties, they are treated together because they are inflected in the identical way--they all occur in the attributive paradigm. Similarly, the distributional classification of nouns is ignored in favor of their inflexional properties.
IV.1 Person and number markers.

Person and number markers occur in a number of different constructions, but due to their similarity they are analyzed here as a group. In general four persons and three numbers are distinguished. The three numbers are singular, dual and plural. The persons are first exclusive (excluding the hearer), first inclusive (including the hearer), second, and third. Further, an "impersonal" person, like the French on, exists in the singular.

The constructions which contain these markers are these:

1. subject inflection of verbs,
2. pronominal subjects of verbs,
3. independent personal pronouns,
4. object suffixation on transitive verbs,
5. attributive inflection,
6. inflection of relational words.

The relevant portions of these constructions are displayed as paradigms below.

1. Subject inflection of verbs:

<table>
<thead>
<tr>
<th>prefix</th>
<th>suffix</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.ex</td>
<td>gu-</td>
</tr>
<tr>
<td>1.in</td>
<td>da-</td>
</tr>
<tr>
<td>2.</td>
<td>mu-, m-</td>
</tr>
<tr>
<td>3.</td>
<td>i- ~ ra-</td>
</tr>
</tbody>
</table>

(latter in du., pl.)

<table>
<thead>
<tr>
<th></th>
<th>singular</th>
<th>dual</th>
<th>plural</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>-e:w</td>
<td>-e:d</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>-gow</td>
<td>-ga:d</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>-w</td>
<td>-d</td>
</tr>
</tbody>
</table>

impers n-
<table>
<thead>
<tr>
<th></th>
<th>singular</th>
<th>dual</th>
<th>plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Pronominal subjects.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.ex</td>
<td>gu-</td>
<td>gamow</td>
<td>gama:d</td>
</tr>
<tr>
<td>1.in</td>
<td></td>
<td>gadow</td>
<td>gada:d</td>
</tr>
<tr>
<td>2.</td>
<td>ga-</td>
<td>gime:ew</td>
<td>gime:d</td>
</tr>
<tr>
<td>3.</td>
<td>ø</td>
<td>yow</td>
<td>ya:d</td>
</tr>
<tr>
<td>impers</td>
<td>n-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 3. Independent personal pronouns. |          |       |        |
| 1.ex | ga:g | gamow | gama:d |
| 1.in |       | gadow | gada:d |
| 2.  | gur  | gime:w | gime:d |
| 3.  | qir  | yow   | ya:d   |

| 4. Object suffixation on transitive verbs. |          |       |        |
| 1.ex | -e:g | -mow | -ma:d |
| 1.in |       | -dow | -da:d |
| 2.  | -e:m | -me:w | -me:d |
| 3.  | ø    | -row | -ra:d |

| 5. Attributive inflection. |          |       |        |
| 1.ex | -g | -mow | -ma:d |
| 1.in |       | -dow | -da:d |
| 2.  | -m | -me:w | -me:d |
| 3.  | -n ~ ø | -row | -ra:d |
| impers | -y |       |        |
6. Certain relation words, e.g., ro:- (possessive), ηo:- (direction) which parallels ro:- in dual and plural.

<table>
<thead>
<tr>
<th></th>
<th>singular</th>
<th>dual</th>
<th>plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.ex</td>
<td>ro:ɡ, ηo:ɡ</td>
<td>ro:mow</td>
<td>ro:ma:d</td>
</tr>
<tr>
<td>1.in</td>
<td>ro:m, ηo:m</td>
<td>ro:dow</td>
<td>ro:da:d</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td>ro:me:w</td>
<td>ro:me:d</td>
</tr>
<tr>
<td>impers</td>
<td></td>
<td></td>
<td>--, ηa:y</td>
</tr>
</tbody>
</table>

Information as to whether or not the long vowels in the suffixes are inherently long or variable in length (see II.F) has not been presented in the charts, but is incorporated in the analysis below.

Excepting those instances that are listed later as portmanteau constructions, we may analyze the non-person-number morphemes that appear in the paradigms as follows:

- (i.m.) intransitive marker \(/\text{ga}//\)
- (t.m.) transitive marker \(/\text{e}://\)
- (p.s.) subject or independent pronoun stem \(/\text{g} \sim \text{∅}//\) (latter in the third person)
- (poss.) possessive \(/\text{ro}://\)
- (dir.) directional \(/\text{ηo}: \sim \text{ηa}://\) (latter in third singular)

The paradigms are evidently most regular in the dual and plural. The person and number (dual and plural) morphemes as they appear in this portion of the paradigms are therefore disposed of first. The dual and plural morphemes are as follows. Singular is
unmarked.

(du.) dual: //w//
(pl.) plural: //d://

Next to the dual and plural morphemes the person morphemes have these allomorphs:

1. ex (1st person exclusive) //ma-//
2. //me:-//
3. //ya- ~ -ra-// (the former when initial)

When not next to the dual or plural morphemes, that is, in the singular paradigms and as personal prefixes in all numbers, of the subject inflection (first chart above), the person morphemes have more diverse allomorphs. Again, excepting the later-listed portmanteau constructions, the person morphemes in these positions may be assigned the following basic allomorphs:

1. ex //gu- ~ -e:g ~ -g:// as prefix, object suffix, and elsewhere, respectively.

2. //ga- ~ mu- ~ m- ~ -e:m ~ -m:// as subject pronoun, as prefix before CV roots, as prefix elsewhere, as object suffix, as suffix elsewhere, respectively.

3. //i-// in subject inflection in singular,
   //ra-// in subject inflection in dual and plural and in attributive paradigm in dual and plural.
   //-k':// in inflection of relation words in singular.
   //-na// in alienable attributive inflection in singular,
also called "construct suffix" (c.s.) (IV.2).

//Ø// in inalienable attributive inflection and elsewhere.
impers //n- ~ y// as prefix and suffix respectively.

The following, namely the singular independent pronouns, are considered portmanteau constructions:

//gag:// = p.s. (pronoun stem) + 1.ex = "I"
//gur// = p.s. + 2nd pers. = "you (sg.)"
//qir// = p.s. + 3rd pers. = "he/she/it"

To summarize, the above six sets of paradigms represent the following constructions (parentheses mark optional elements in the constructions):

1. Subject inflection of verbs: person + verb stem + ((transitive or intransitive marker) + dual or plural marker)
   Dual and Plural: Pronoun stem + person + dual or plural marker.
3. Independent pronoun: pronoun stem + person + (dual or plural marker).
4. Object suffix: Person + (dual or plural marker)
5. Attributive suffix: Person + (dual or plural marker)
6. Relational inflection: Person + (dual or plural marker)

The person, number, and other morphemes involved are relatively constant in shape in the dual and plural, but show considerable allomorphic variation in the singular, especially in the third person. The singular independent pronouns are so irregular as to be best regarded as portmanteaux.
The morphophonemic rules most frequently applicable in this analysis are G5 (a > o)w, F2 and F3, and M1 (excrescent vowel in initial cluster), e.g.

-da + w > -dow

(l.in) (du)

-da + d: > da:d

(pl)

g ma w > gamow

(p.s.) (l.ex) (du)

g me: w > gime:w

(2.)
IV.2 Attributive constructions

Attributables are stems which may take the attributive suffixes. These suffixes are constructions containing a person and a number morpheme, and were analyzed in the previous section together with other such constructions. Frequently they indicate possession, but in many cases a more general relationship is implied, as in

nifaj:g "wind caused by me, as by running"
maro:nqa:g "news about me"

When the relationship is possession, it is typically applied to "inalienable" possessions, such as body parts, relatives, or abstract qualities, e.g.

qadi:g "my liver"
wala:ge:g "my sibling"
miri:g "my momentum"

Locationals may also be so inflected:

care:g "near me"
dake:na:g "on top of me"

Many attributables may occur in the ordinary possessive construction (with ro:-) as well. The attributive construction however implies a much closer relationship than does the latter, e.g. (attribution) gana:g "my food, e.g., my portion, or that I am about to eat"

(possession) ga:n ro:g "my food, e.g., that I have gathered"

In some cases a slight shift in meaning occurs:

(attribution) cale:g "my fishing basket"
(possession) ce:1 ro:g "my basket"

(attribution) wola:ge:g "my sibling"

(possession) wola:g ro:g "my friend"

While any substantive, subject to semantic constraints, can occur in the possessive construction, the set of attributables is much more restricted. All but one subclass of attributables are closed classes, containing at most a few hundred members in all. One subclass is, in a limited way, open, as will be seen below.

Some attributables are obligatorily attributed. They have no independent form, but their third singular suffix is zero, as in

/fa:k/ "his child"

Such attributables will be known as "inalienables."

The third singular form of all attributables can occur in a syntactic position in which the other attributive forms do not occur. For some stems this form is the only member of the entire attributive paradigm that can be elicited. We will refer to this form alternatively as the construct form of the stem (Dyen's term for the corresponding construction in Trukese). In most Micronesian languages a construct form exists for each stem, distinct from the third singular attributive form. Both their form and function are different. In Yapese there is only one form morphologically, though it serves in two syntactic functions. The construct form of, for instance, pi:y "hair", is piy:in, which can mean "his (its, her) hair" or "hair of", as in

piya:n lo:lg:in "hair-of his head, his (head-) hair"

An example of the inalienable, fa:k, above, used as a construct form is
fæ:k nime:n  "egg (child-of chicken)"

An analysis of the attributive paradigms, together with relevant examples, follows. For examples, only the independent form (where it exists), or the construct form in the case of inalienables, and the first person singular form (suffix -:g) are given, since the stem vowel, the vowel immediately preceding the suffix, remains the same throughout the paradigm (with appropriate shortening or dropping in nonfinal syllables). For reference one complete paradigm is shown here:

"liver" (indep. form) qâ:d

<table>
<thead>
<tr>
<th>singular</th>
<th>dual</th>
<th>plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.ex</td>
<td>qadi:g</td>
<td>qadamow</td>
</tr>
<tr>
<td>1.in</td>
<td>qaddow</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>qadi:m</td>
<td>qadame:w</td>
</tr>
<tr>
<td>3.</td>
<td>qadi:n</td>
<td>qadrow</td>
</tr>
<tr>
<td>impers</td>
<td>qadiy</td>
<td></td>
</tr>
</tbody>
</table>

The personal endings themselves are, morphophonemically,
-g:       -maw        -mad:
    -daw        -dad:
-m:       -me:w       -me:d:
-na       -raw        -rad:
-y

They were analyzed in the previous section.

Consider the pairs
liver/my liver    qâ:d    qadi:g
feather/my feather wu:l   wulâ:g
pain/my pain qamiz: qamizu:g

These are representative of a large class of attributive paradigms in which 1) the stem vowel is not predictable from the environment, and 2) the final vowel of the independent form (the root vowel) is variable in length (in the sense of section IIIF), i.e., is long in the independent form but is short when a suffix is attached.

These facts are most conveniently described by postulating a final vowel in the base form of the stem, the dropping of which in the independent form is accompanied by the lengthening of the previous (root) vowel (by rules F), but the retention of which when followed by a suffix of the form //C:// or //CV// accounts for the various vowels that occur in the singular paradigm. Thus the base forms for the stems in the above examples would be, respectively,

//qadi wula qamizu/.

In the dual and plural inflections, rule Fla cannot operate on the stem vowel but rule Flb can. This results in the dropping of the stem vowel without compensatory lengthening of the previous vowel.

To illustrate the foregoing, three complete derivations are displayed below. They are of the stem //qadi// "liver" in the independent form, the first person singular, and the second person dual.
<table>
<thead>
<tr>
<th>//qadi//</th>
<th>//qadi g://</th>
<th>//qadi me:w//</th>
</tr>
</thead>
<tbody>
<tr>
<td>DlA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FlA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FlB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[
/\dd{a}/ \\
/\dd{a}/ \\
/\dd{a}/ \\
/\dd{o}/ \\
/\dd{o}/ \\
/\dd{a}/
\]

The final vowels of the morphophonemic base forms of the stems will also be referred to as stem vowels, and the stems themselves will be called i-stems, a-stems, or u-stems according to their stem vowels. In each idiolect there are also a few ḵ-stems.

There are also stems for which one might postulate the stem vowel e, such as for

\[\text{pot/my pot} \quad \text{z'ib} \quad \text{z'ibe:g}\]

but for reasons discussed later this is not the solution adopted for these paradigms.

Another large class of attributables is represented by the following pairs:

\[\text{ear/my ear} \quad \text{te:l} \quad \text{te:li:g}\]
\[\text{his child/my child} \quad \text{fa:k} \quad \text{fa:ka:g}\]

The same solution of postulating final vowels in the base form of the stems is used. In these cases the root vowel is inherently long, and is not further lengthened in the independent form when the stem vowel drops (that is, rule F2 is not satisfied but Flb and F3 are). The stems are
As with the previous pattern, here too there are what one might call e-stems, but again this solution is not adopted. An example is

$sibling$/$my$ $siblings$ $wola$:g $wola$:ge:g

The above sets of examples have shown the root vowel in the independent form as inherently long and as variable in length (in the sense of rules F). There is also a large class of stems whose final syllable vowels are inherently short, as in

$island$/$my$ $island$ $do$nuc $do$:nuce:g

$pubic$ $hair$/$my$ $pubic$ $hair$ $bun'$ $bun$:e:g

A stem vowel, say e, cannot be postulated for the stems in these paradigms because the root vowels of the independent forms would then be lengthened by rules F, whereas they are in fact short. However it can be noted that only e appears as the stem vowel in this pattern. The proposed solution is that we are here dealing not with the simple attributive construction

stem + attributive suffix

but with another, what might be called the classified attributive construction:

stem + attributive classifier + attributive suffix

where, in these cases, the attributive classifier (a.c.) has the shape //e//. Such a construction, with //e// as the attributive classifier, will be known for short as the e-construction. There is another such classifier, //qi//, which will be exemplified later. The basic forms of the stems in the above examples would simply be

//do:nuc $bun'$//
Before the third singular suffix //-na// the //e// becomes //e// by rule Ela, giving, for the construct form of //do:nuc//, /do:nuc:ə:n// "island of". This //e// in the construct form is the only reason for postulating //-na// rather than simply //-n:/// as the construct suffix.

It was mentioned above that there are stems with inherently long or variable-length root vowels which take e before the suffixes, e.g.

pot/my pot         z'i:b         z'ibe:g
sibling/my sibling wala:g     wala:ge:g

With the classified attributive construction available, there are now two possible ways to analyze these paradigms, one in which the stem vowel e is postulated, the other in which the e-construction is used:

///z'ibe + g:// or ///z'ib: + e + g://
///wala:ge + g:// or ///wala:g + e + g://

To avoid arbitrariness the same solution should be adopted for all stems that take e in the attributive paradigm. The following observations may be construed as slightly favoring the second alternative.

1) The class of stems which take e is much larger than the classes of i-, u-, or a-stems. It seems to be a somewhat productive class. Informants would place unfamiliar stems into this class more readily than into any other, and a few apparently borrowed words, such as ki:l, "keel", appear in it.

2) There is considerable variation among informants, and even oscillation with the same informant, between the e paradigm.
and each of the other paradigms, whereas there is practically none among the latter paradigms as a group. Free alternations such as these are frequent:

\[
\text{right/my right} \quad \begin{array}{c}
mat'a:w \\
mat'owa:g \sim mat'owe:g
\end{array}
\]

whereas free alternation among the stem vowels i, u, and a practically does not occur.

Both these unique properties of the e paradigm suggest that the e is not a stem vowel paralleling the other stem vowels i, u, and a. Furthermore, to call the e a stem vowel in these cases would limit the e-construction to consonant-final stems. The solution proposed here therefore is to regard all e paradigms as instances of the e-construction.

There is a handful of paradigms in which the stem vowel is definitely short, as in

\[
\text{accurate/opposite me} \quad \text{puluw} \quad \text{puluwog}
\]

If the base form of this stem were //puluw//, one would expect *puluwe:g as the first singular form. If it were //pulowo//, one would expect *pulowo:g. In these paradigms however, it is possible to predict the quality of the stem vowel from that of the root vowel. It is therefore possible to postulate basic forms of the stem without a final vowel, so that compensatory lengthening would not take place in the independent form. Rules H, which was motivated by this paradigm, inserts the proper stem vowel when a suffix follows the stem:

\[
//puluw + g:// > /puluwog/
\]

One or two of the stems in this paradigm also sometimes appear in the e paradigm, e.g.
its color \( \text{raqê:n} \)

Although the analysis of each of the types of paradigms above was shown to be independently motivated, there is a general pattern which accommodates all of them. There are two constructions, the simple attributive construction and the classified attributive construction, in each of which the attributable stem may be a consonant-stem (ending in a consonant in the base form) or a vowel- or :-stem. Some of the examples already exhibited above are here tabulated according to this pattern:

<table>
<thead>
<tr>
<th>Simple attrib. constr.</th>
<th>C-stem with short root vowel</th>
<th>C-stem with long root vowel</th>
<th>V- or :-stem</th>
</tr>
</thead>
<tbody>
<tr>
<td>/pu:luw/</td>
<td></td>
<td>/qadî/</td>
<td></td>
</tr>
<tr>
<td>/do:ŋuc/</td>
<td>/wola:g/</td>
<td>/z'ib:/</td>
<td></td>
</tr>
</tbody>
</table>

Finally, there is a large class of attributive paradigms containing the attributive classifier \( \text{ŋi} \), as in this example:

strong/my strength \( \text{ge:l} \) \( \text{ge:ŋi:g} \)

What is probably another allomorph of this attributive classifier, \( \text{ŋe} \), occurs with one or two stems in each informant's idiolect:

measurement/my measurement \( \text{fo:l} \) \( \text{fo:ŋe:g} \)

handle/its handle \( \text{kö:l} \) \( \text{kö:ŋe:n} \sim \text{kö:le:n} \)

eyelashes/his eyelashes mazar mazarŋe:n

A few stems can occur both in the simple attributive construction and in the \( \text{ŋi}-\)construction, with difference in meaning, e.g.

his arm/my arm/my branch (if I were a tree) \( \text{pa:q} \) \( \text{paqa:g} \) \( \text{paqanji:g} \)

However no difference in meaning can be detected between a stem in
the e-construction and the same stem in a simple attributive construction, for those stems that appear in both.

The term *attributed noun* will be used to designate the two attributive constructions described in this section. The third person singular attributive form will alternatively be known as the construct form of the stem.

Stems would be marked in the lexicon as to whether or not they are attributable stems. Each attributable stem would further be marked as to whether or not it is inalienable, whether or not it takes an attributive classifier, and if so which one(s) it takes. In practice, for each attributable stem, two items are sufficient to conveniently specify all the above information: the morphophonemic base form of the stem, and the construct form. For stems such as //paqa//, "arm", two construct forms would be needed, to indicate the two constructions in which it may enter.
IV.3 Transitivity suffixes.

The two main classes of words are nouns and transitive verbs. The latter are known by their ability to take the transitive marker //e:// before the dual and plural number suffixes (IV.1). They also must take objects, either as pronominal object suffixes or with the linking particle //e:// (when the object is not an attributed noun) or directly (when the object is an attributed noun).

Derivation of transitives or nouns from roots or from already derived words of the opposite class occurs frequently. In fact nearly every word has a counterpart in the opposite class. Derivation of transitives is, for the most part, by suffixation; of nouns, by prefixation with //ma-/>. Some derivation is suppletive. Roots themselves are about equally distributed between the two classes. Some roots belong to both classes. A few occur only in derived (transitive or nominal) forms, such as //ni// in /mä:n/ and /niŋ/, "close", //bi// in /mä:b/ and /biŋ/, "open", //qaca(:/// "paint" in /maqaca:w/ and /qacay/. The transitivity suffixes are, in descending order of frequency, //e-g:, -e-g, -g:, -ŋ, -ŋ//. Each root must be marked for which one of these suffixes, if any, it takes. A few may take two of them in dialect variation or apparently free variation. Some of these are pointed out below.

The last three suffixes are very rare, and the known roots with which they occur can be listed:
<table>
<thead>
<tr>
<th>/underived or /root// related form/ /derived form/</th>
</tr>
</thead>
</table>
| -η
| "steal" | roq ~ qir | moroqoroq | qirη |
| "tease" | k'ar | k'ar | k'ariη |
| -η
| "open" | bi | ma:b | biη |
| "close" | ni | ma:n | niη |
| "find" | fai | fay | fe:η |
| "tease" | k'ar | k'ar | mak'araŋ (re-nominalized with ma-)

| -ŋ:
| "dive" | liza | li:z | liza:ŋ |
| "hide" | miza | mi:z | miza:ŋ |
| "throw" | in'a | yin'a | yin'a:ŋ |
| "straight" | k'iyä | k'iy: | k'iyä:ŋ (also with -e:ŋ) |
| "dislodge fruit with pole" | qe:w | qe:w | qo:g (also with -e:ŋ) |
| "shake" | ru:ru | ru:r | ru:ru:ŋ |

The transitivizing suffix //y// may occur with vowel-final, :-final, or consonant-final roots. In the latter two cases a vowel is inserted before the y by rules H. Some examples follow:

<table>
<thead>
<tr>
<th>/underived or /root// related form/ /derived form/</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;pull&quot;</td>
</tr>
<tr>
<td>&quot;grop (for)&quot;</td>
</tr>
<tr>
<td>&quot;split&quot;</td>
</tr>
<tr>
<td>&quot;eat (raw)&quot;</td>
</tr>
</tbody>
</table>
The transitiveizing suffixes //e:ɡ// and //eɡ// are the most common. Rule Elb lowers the e of //eɡ// to ə when the previous vowel, in the root, is low, but the e of //e:ɡ//, being long, escapes the application of this rule. Thus we have, for instance,

/foːleːɡ/ "measure", with //eɡ//, but
/ŋaloːləɡ/ "tilt", with //eɡ//.

Oscillation between the two suffixes occurs very frequently, at least for some informants. For instance these pairs were claimed by one informant to be acceptable:

/luk'aːfeːɡ/ and /luk'aːfeːɡ/ "step over"
/sabzareːɡ/ and /sabzareːɡ/ "slip".

Below are further examples of derivation with //eɡ//. Most of them are chosen for some special irregularity or other, such as showing a special allomorph before the suffix or being able to take another transitiveizing suffix.

"turn away" //cəːɡ ~ cəːɡ//: /cəːɡ ~ cəːɡ/, /ceːfeːɡ ~ cəːɡ/. Also with //y//: /ceːfiːɡ/.
"twist" //l̂eiːpə~leːpe:// (latter with -y): /l̂eiːp/, 
/leːpeːɡ/. Also with //-y//: /lepeːy//.
"scrape bottom" //sɛːr//: /sɛːr/, /sɛːreːɡ/.
"wake up" //qod//: /qod/, /qodːɡ/ (G2 exceptionally 
does not apply; o remains o.)
"pass, relation" //zili~ziliy//: /ziliːn/, /ziliyeːɡ/.
"transport" //qaːfu~qaːfuw//: /qaːf/, /qaːfuːweːɡ ~ qaːfeːɡ/.
"return" //suːlo~suːluw//: /suːl/, /suːlweːɡ/.
"occur" //nul'ːu~nul'ːuw//: /nul'ːl/, /nul'ːuweːɡ
ŋul'ːeːɡ/.
"leak" //lul'ː~luːl'uw//: /luːl'/, /luːl'uweːɡ ~ luːl'eːɡ/.
"sew" //yuːy~yuːyuw//: /yuːy/, /yuːyːuweːɡ/.
"lean, fall over" //zig~zing//: /zig/, /zingːɡ/.
"turn over" //pigː~pιn//: /piːɡ/, /pιŋeːɡ/.
"fence" //yarοːriː//: /yarοːr/, /yarοːreːɡ/. Also with //-y//: 
/yaroːriy//:.
"sleep" //moːl//: /moːl/, /maːlːeːɡ/.
"run" //miːl//: /miːl/, /mileːɡ/.
IV.4 Nominalization.

Apart from their lack of those attributes which distinguish the transitive verbs (IV.3, beginning), nouns do not form a coherent class with a small set of exclusively shared attributes. However certain properties are common, even though not universal, among nouns. Classes can be set up on the basis of these properties, but these classes are not mutually exclusive. One of the larger classes is the intransitive verbs, distinguished by their ability to take the intransitive marker before the number suffix. A small class, the atransitives, take the number suffixes directly, without the intransitive marker. Some may function as subjects or objects, or take various predicative prefixes.

The prefix //ma-~ m-~ ma:-~ mo:-// is most commonly used to derive nouns from transitive roots or other transitivized words. (This prefix is not to be confused with at least one other prefix of the shape //ma:-//.) A large proportion of roots may occur with this prefix. //ma-//- is the productive allomorph. The others occur with small listable sets of roots. There is some oscillation and dialect variation between all these allomorphs, as in these examples:

//ma:-~ mo:-// with //luk// "wash, bathe"
//ma-~ ma:-// with //sai// "split"
//m-~ ma-//- with //ququy// "crush"
//mo:-~ m-//- with //kun// "gather"
The roots which take the allomorph //m-// are as follows:

"gather" \quad quluŋ

"pile" \quad qufuŋ

"suck (obscene)" \quad qun \quad c.f. "follow" qun, which takes //ma-//

"fit together" \quad qulu:li

"sharp, angry" \quad quz

"name-giving" \quad tuŋ

"inspect" \quad le:ka:g

"boil" \quad ligil

Before u in the initial syllable of the root an excrescent /u/ appears after the prefix m- by rule M1. Before e and i in the initial syllable, i appears, by the same rule.

The allomorph //ma:// occurs with the following roots:

"scratch" \quad gur

"transfer" \quad luk'af:

"split" \quad sai

"wash" \quad luk

The allomorph //mo:-// occurs with the following roots:

"stuff, pack" \quad cug

"stab" \quad rug

"shake" \quad ru:ru
When //ma-// occurs, it frequently takes the phonemic shape /mo-// through the action of rule J5. Vowels in the root itself are altered, as applicable, by rules J3 and 4, and Elb. Here are some examples.

<table>
<thead>
<tr>
<th>/underived or /related form/</th>
<th>/derived form/</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;go on errand&quot;</td>
<td>l'o:g</td>
</tr>
<tr>
<td>&quot;jump&quot;</td>
<td>qo:g</td>
</tr>
<tr>
<td>&quot;waste, abuse&quot;</td>
<td>goza</td>
</tr>
<tr>
<td>&quot;tear&quot;</td>
<td>gucz</td>
</tr>
<tr>
<td>&quot;angle (fishing)&quot;</td>
<td>l'eg:</td>
</tr>
<tr>
<td>&quot;dive&quot;</td>
<td>liza</td>
</tr>
<tr>
<td>&quot;threaten&quot;</td>
<td>ge:r</td>
</tr>
<tr>
<td>&quot;close&quot;</td>
<td>ni</td>
</tr>
<tr>
<td>&quot;turn away&quot;</td>
<td>ce:l</td>
</tr>
</tbody>
</table>

Another nominalizing affix is the suffix //w//. It occurs with a small list of roots. Some of these nominalized forms always occur re-transitivized by the suffix //eg://, or //e:g//.

<table>
<thead>
<tr>
<th>/underived or /related form/</th>
<th>/derived form/</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;split&quot;</td>
<td>sai</td>
</tr>
<tr>
<td>&quot;dry off&quot;</td>
<td>da:</td>
</tr>
<tr>
<td>&quot;arrive&quot;</td>
<td>ta:</td>
</tr>
<tr>
<td>&quot;broom, sweep&quot;</td>
<td>walagu</td>
</tr>
<tr>
<td>&quot;look at&quot;</td>
<td>ga:</td>
</tr>
<tr>
<td>&quot;paint&quot;</td>
<td>qaca(:)</td>
</tr>
<tr>
<td>&quot;scrape, rub&quot;</td>
<td>rai ~ ra:</td>
</tr>
</tbody>
</table>
IV.5 Verb inflection.

The three-way distinction of verbs, transitive, intransitive, and atransitive, is based on the morphology of their inflection in the dual and plural. As has already been stated in the relevant places, these classes of verbs take their respective markers (e:, ga, ∅) before the dual and plural suffixes. These markers and suffixes, with the other person and number constructions, were analyzed in IV.1, but a statement of the verbal paradigms in which they occur, as well as examples of the paradigms, have been reserved for the present section. Below are examples of a paradigm of each of the three types of verbs, inflected in the inceptive tense for all persons. The first two verbs chosen, //fil// and //fo:1//, are a suppletively related transitive verb and noun pair.

//fil// "pick (cnuts)" (tr)

<table>
<thead>
<tr>
<th></th>
<th>singular</th>
<th>dual</th>
<th>plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.ex</td>
<td>ŋgufil</td>
<td>ŋgufile:w</td>
<td>ŋgufile:d</td>
</tr>
<tr>
<td>1.in</td>
<td>ndfile:w</td>
<td>ndfile:w</td>
<td>ndfile:d</td>
</tr>
<tr>
<td>2.</td>
<td>ŋamfile:w</td>
<td>ŋamfile:w</td>
<td>ŋamfile:d</td>
</tr>
<tr>
<td>3.</td>
<td>ŋe:fil</td>
<td>ŋarfile:w</td>
<td>ŋarfile:d</td>
</tr>
<tr>
<td>impers</td>
<td>ŋanfil</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
//fo:1// "picking (cnuts)" (intrans)

<table>
<thead>
<tr>
<th></th>
<th>singular</th>
<th>dual</th>
<th>plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.ex</td>
<td>ngufo:1</td>
<td>ngufo:lgw</td>
<td>ngufo:lgad</td>
</tr>
<tr>
<td>1.in</td>
<td>nadfo:lgw</td>
<td>nadfo:lgad</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>nafmo:1</td>
<td>nafmo:lgw</td>
<td>nafmo:lgad</td>
</tr>
<tr>
<td>3.</td>
<td>niffo:1</td>
<td>nafro:lgw</td>
<td>nafro:lgad</td>
</tr>
<tr>
<td>impers</td>
<td>nafno:1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

//no:no// "talk" (a tran s, but in some idiolects intrans)

<table>
<thead>
<tr>
<th></th>
<th>singular</th>
<th>dual</th>
<th>plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.ex</td>
<td>ngufo:n</td>
<td>ngufo:now</td>
<td>ngufo:no:d</td>
</tr>
<tr>
<td>1.in</td>
<td>nadno:now</td>
<td>nadno:no:d</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>namno:n</td>
<td>namno:now</td>
<td>namno:no:d</td>
</tr>
<tr>
<td>3.</td>
<td>nifno:n</td>
<td>narno:now</td>
<td>narno:no:d</td>
</tr>
<tr>
<td>impers</td>
<td>nanno:n</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The elements of these inflectional paradigms are as follows:

(tense-aspect) + person + stem + ((T.m.) + number)

where parentheses indicate optional elements. (T.m. stands for transitivity marker.)

A partial list of the tense-aspect prefixes, including two which can be analyzed as being "compound", i.e., as each consisting of two of the "simple" prefixes, follows:

//ŋa// (inceptive) "going to, about to, etc."

//ka ~ ku// latter before //qu// (see below). (past, non-future).
//qa// (perfective) Indicates completed action. Usually with ka-, past tense.

//qu// (imperfective) Indicates progressive or habitual action. Usually with ku-, past tense.

//ka-qa// (past perfective, anterior) Compound tense. Indicates action completed before another.

//ku-qu// (past progressive or habitual) Compound tense.

//ba:i// (future).

The person prefixes have already been listed and analyzed (IV.1). The stem may be a root or a word derived by a transitivizing or nominalizing affix (IV.3, 4) or by reduplication (IV.7). An analysis of some uncommon alternations shown by certain stems in their inflectional paradigms is given in the next section (IV.6).

The rest of the construction is absent in the singular. In the dual and plural the transitivity marker must agree with the transitivity of the stem, being absent for intransitive stems. This marker and the dual and plural morphemes have also been analyzed previously (IV.1).

There is another common pattern of verbal inflection which differs from the above constructions in the morphemes and order of morphemes preceding the stem:

subject pronoun + predicative prefix + stem

The subject pronouns were analyzed in IV.1. The "predicative" prefixes are a small and variable set, of which //be:// (present progressive) is the most common. Few morphophonemic examples however are drawn from this construction, and it is not further analyzed.
Unlike the transitives and intransitives, atransitives are a very small class of roots. Only five are known:

/ya:n/  "go, walk"
/yi:b/  "come"
/yi:m'/ "die"

//su:lo ~ si:lo// "return" (Latter alternant in dual and plural in some dialects)
//no:no// "talk"

An analysis of the alternations of the first three of these is included in the following section.
IV.6 Vowel-initial verbs

Most stems that occur in verb paradigms have at least two consonants in the morphophonemic base form. They have the shape CV(:)C or longer. A number however have basic allomorphs of the shape V(:)C or VCV. They all show dialect variation and oscillation between basic forms. Their paradigms provide further examples of the application of some of the morphophonemic rules.

A typical example of this class is /\ö:n'/ "throw". At least three patterns of alternation of this root can be distinguished in various idiolects. Some idiolects oscillate between two or among all of these patterns. Excerpts from paradigms exhibiting the three patterns are given here, preceded with initials of the respective informants.

I, M. 1. ngö:n', ñamö:n', ñe:yo:n', ñado:n'e:w,
ñarlo:n'e:d. Indep. form: yo:n'.
Th. 2. ngö:n', ñamo:n', ñe:yo:n', ñado:n'e:w,
ñarlo:n'e:d. Indep. form: yo:n'.
I, Th. 3. ngu:n', ñamu:n', ñe:yi:n', ñgun'e:w, ñado:n'e:w,
ñarn'e:w, ñarlo:n'e:d. Indep form: yi:n'.

In the first pattern the basic allomorph is /\ö:n'/ throughout the paradigm. Rules L supply y's in the third singular and independent forms.

In the second pattern the basic allomorphs are /\ö:n' ~ ńö:n'/, the latter occurring in the third singular and independent forms only.

In the third pattern the basic allomorphs are
//n': ~ in'a ~ ə:n'/. //n':// occurs with the 1st and 2nd persons; //in'a// with third singular and independent forms; and //ə:n'// occurs elsewhere. The final //a// is necessitated by the transitive form //yin'a:ɡ/ (-ɡ: trans, IV.3).

In all three paradigms, rules F1 operate to delete or retain the vowels of the prefixes. In some idiolects it is possible on occasion to see the independent forms //yi:n'/ or //yə:n'/ used as the basic allomorph through the whole paradigm: ȵgyi:n', ȵmyi:n', etc., or ȵguyö:n', ȵmyö:n', etc.

For convenience, the root in all its variations will be referred to with its most frequent allomorph, //ə:n'/. Note that it is transitive, having //e:// in the dual and plural.

Another transitive root, //ə:t'// "step on, look for", parallels //ə:n'// in all its patterns of alternation.

The root //ə:ɡ// "say", also transitive, exhibits only the first two of the above three patterns of alternation. Those informants who use the third pattern for //ə:n'// and //ə:t'// use either the first or second for //ə:ɡ//.

The two roots //ə:f'// "take a step" and //ə:p'// "shoot", both transitive, occur with the third but not with the first and second patterns. They also occur in a fourth pattern, as illustrated by the following excerpt from a paradigm of //ə:p'//.


Indep. form: yi:p'.

The allomorphs in this pattern are //p': ~ ip':// with the latter occurring only in the third singular and the independent forms. As with the previous roots, the independent form sometimes appears as
the base for the entire paradigm: ŋuyi:p', ŋamyi:p', etc.
Another independent form that is reported for some dialects is
/wu:p'/.

The two attransitive verbs //im'ta/ "die" and //iba/ "come"
also occur in the fourth pattern of alternation, but not in the
other three. An excerpt from a paradigm for //iba// follows:

ŋgu:b, ŋamu:b, ŋe:yi:b, ŋubow, ŋadabow, ŋamba:d,

The allomorphs are //ba ~ iba// the latter occurring only with the
third singular and independent forms. In some dialects the
allomorph //ba// is used also in the third singular, giving /kə:b/
(by rules A1, E1, F).

The imperatives of most verbs are simply the second
person forms without any tense-aspect prefix, but for this verb they
arise from a completely different base form. The forms themselves
are simply listed here:

<table>
<thead>
<tr>
<th></th>
<th>singular</th>
<th>dual</th>
<th>plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;come!&quot;</td>
<td>mō:y</td>
<td>mare:w</td>
<td>mare:d</td>
</tr>
</tbody>
</table>

The very common attransitive verb //yā:n// "go, walk", is
extremely irregular, having about seven basic allomorphs with
closely related shapes of the form //C1VC2o// where

\[
C_1 = v \text{ in the 1st ex}, \\
= m \text{ in the 2nd person}, \\
= \emptyset \text{ elsewhere}.
\]

\[
V = a: \text{ in the singular,} \\
= a: \text{ in the dual and plural.}
\]
\[ C_2 = n \text{ in the singular and for the third person of all numbers,} \]
\[ = r \text{ elsewhere.} \]

The paradigm in the inceptive is given to illustrate the different shapes:

<table>
<thead>
<tr>
<th></th>
<th>singular</th>
<th>dual</th>
<th>plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.ex</td>
<td>ṇa:u:w:n</td>
<td>ṇa:u:w:ro:w</td>
<td>ṇa:u:w:ro:d</td>
</tr>
<tr>
<td>1.in</td>
<td>ṇa:ro:w</td>
<td>ṇa:ro:d</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>ṇa:m:ṇa:n</td>
<td>ṇa:m:ṇa:ro:w</td>
<td>ṇa:m:ṇa:ro:d</td>
</tr>
<tr>
<td>3.</td>
<td>ṇa:y:ṇa:n</td>
<td>ṇa:y:ṇa:ro:w</td>
<td>ṇa:y:ṇa:ro:d</td>
</tr>
<tr>
<td>impers</td>
<td>ṇa:y:ṇa:n</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
IV.7 Reduplication.

Reduplication does not seem to be a regular derivational or inflectional process. It does not change the word class of the word being reduplicated. Its semantic functions however are manifold, though unpredictable without a semantic analysis of the vocabulary. Some of the common functions are intensification, diminution and attenuation (especially with the prefix s- in addition), repetition, simulation, etc. These functions however do not, in general, correspond to the different morphophonemic types of reduplication described in IIIR. Some examples are given here.

Repetitive or continuous:

Rpl  tö:y "hit, strike"  tö:y+tö:y "continuous hitting"
Rpl  cu:r "travel, journey"  cu:rcu:r "traveling all the time"
R1  m'iq "broken, folded"  m'iqm'iq "curly"
R2  liye:g "avoid"  null "winding (as road)"
R1  pe:l "half visible"  pe:lpel "appearing intermittently"

Intensive or exaggerated:

R1  ciŋ "tight"  ciŋciŋ "very tight"
R1  pa:l "out of shape"  pa:lpal "very much out of shape"
Rm1  ma:z' "severed"  maz'amaz' "all cut up"
R1  m'uz "sharp, pointed"  m'uzm'uz "very sharp, pointed"
R1  wë: minWidth="400" height="400">
</div><div class="content">
R3  mogoz "torn"  mogozmogoz "all torn up"
</div>
"Likely to, ready to ...":

Rm1 po:q "burst open" poqopo:q "ready to burst"
R1 puz "cave in" puzpuz "as though about to cave in"
R1 qod "wake up" qodqod "about to wake up"
R1 mak' "swamp, fill up" mak'amak' "about to be swamped"

Attenuative:

Rp3 qacuy "shake, rock (a boat)" saqacuycuy "rock a little"
R2 k'e:g "hotten a fire or pot" sik'e:k'e:g "turn up heat a little"
R3 qabin:c "eat" saqabi:cbin:c "nibble"
Rpl tō:y "hit" stō:yto:y "to chop gently"
Rpl row "red" rowrow "reddish"
Rm1 qā:r "cloudy, stirred up" qarqa:r "somewhat murky"
R3 qazib "sweet" qazibzib "sweetish"

Simulative:

R2 sa:z "wander aimlessly" sa:sa:z "as though wandering about aimlessly"
Rm1 nā:l "termite" nai:na:l "wormy (of wood)"
Rm1 pu:1 "moon" pulpu:1 "moon-shaped"
V. Examples of morphophonemic derivation.

The sets of examples in this chapter bring together individual morphemes in different environments to show the diverse ways in which the rules are responsible for their varying shapes. I have attempted to exhibit examples of all of the most common alternations, and all of the various shapes of the grammatical morphemes mentioned in the chapter on morphology. Some of the examples have appeared before but are shown here with their complete derivational histories.

//qadi// "liver" (attrib)

\[
\begin{array}{ccc}
\text{(indep)} & \text{(1.sg)} & \text{(1.ex) (pl)} \\
qadi & qadi & qadi \\
Dla & a & g: \\
F1a & : & \\
F1b & : & \\
F2 & : & \\
F3 & \emptyset & \\
M2 & qa:d & qadi:g & qadama:d \\
\end{array}
\]
//geqi//  "rectum" (attrib)

<table>
<thead>
<tr>
<th>(indep)</th>
<th>(1.sg)</th>
<th>(1.ex) (du)</th>
</tr>
</thead>
<tbody>
<tr>
<td>geqi</td>
<td>geqi g:</td>
<td>geqi ma w</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fla</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>F1b</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G1a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J2c</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

geq:q    giqi:g  geqemow

//cura//  "journey" (attrib)

//qufa//  "pride" (attrib)

<table>
<thead>
<tr>
<th>(indep)</th>
<th>(1.sg)</th>
<th>(1.sg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>cura</td>
<td>cura g:</td>
<td>qufa g:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D1b</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>F1a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

cu:r    cura:g  qufa:g
//niwa//  "coconut"  (attrib)

<table>
<thead>
<tr>
<th>(indep)</th>
<th>(1.sg)</th>
<th>(poss)</th>
</tr>
</thead>
<tbody>
<tr>
<td>niwa</td>
<td>niwa g:</td>
<td>niwa ro:g</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fla</th>
<th>Flb</th>
<th>F2</th>
<th>F3</th>
<th>K2a</th>
<th>Qlb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>:</td>
<td></td>
<td>:</td>
<td></td>
</tr>
</tbody>
</table>

ni:w   niwa:g   ni:ro:g
// binawa //  "village" (attrib)

(indep)  (1.sg)  (poss)
binawa  binawa  g:  binawa  ro:  g:
Dla  .a  .a  .a
Fla
Flb
F2
F3
G4c
J2c
K2a
N2
Qlb
S1

[Diagram]

bina:w  binwa:g  bine:ro:g

// laŋu //  "raw food, eat (sthg) raw" (attrib)

(indep)  (1.sg)  (tr)
lau  laŋu  g:  laŋu  y
Fla
F2
F3
[Diagram]

laŋu  laŋu:g  laŋuy

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//qoŋu// "grass skirt, to own a grass skirt" (attrib)

(indep) (l.sg) (tr)
qoŋu qoŋu g: qoŋu y
Fla : : :
F2 : :
F3 Ø Ø
G3b ——— ——— ———
qoŋu qoŋu:g qoŋu:y

//dal'u// "penis" (attrib)

(indep) (l.sg)
dal'u dal'u g:
Dla a :
F : Ø :
**da:l'** dal'u:g
//qupōŋu// "cover" (e-attrib)

<table>
<thead>
<tr>
<th>(indep)</th>
<th>(a.c.) (3.sg)</th>
<th>(tr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>qupōŋu</td>
<td>qupōŋu e na</td>
<td>qupōŋu y</td>
</tr>
<tr>
<td>Ela</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flα</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G3a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G3b</td>
<td></td>
<td></td>
</tr>
<tr>
<td>qupōŋu</td>
<td>qupanə:n</td>
<td>qupuŋuy</td>
</tr>
</tbody>
</table>

//yol:// "relationship" (e-attrib)

//z'ib:// "pot" (e-attrib)
//cel:// "basket" (e-attrib)

<table>
<thead>
<tr>
<th>(indep)</th>
<th>(a.c.)(1.sg)</th>
<th>(poss)</th>
</tr>
</thead>
<tbody>
<tr>
<td>cel:</td>
<td>cel: e g:</td>
<td>cel: ro: g:</td>
</tr>
</tbody>
</table>

Elc
F2
F3
Gld

//suw// "authority" (attrib)

//rog// "method, welfare" (attrib)

<table>
<thead>
<tr>
<th>(3.sg)</th>
<th>(2.sg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>suw</td>
<td>rog</td>
</tr>
<tr>
<td>na</td>
<td>m:</td>
</tr>
</tbody>
</table>

Fla
F2
F3
Hlb
H3

suwon
rogom
//mat'awa//  "right (side and privilege)"
(attrib, in some dialects e-attrib)

(indep)                      (l.sg)                      (a.c.)
mat'awa                        mat'awa g:                    mat'awa e g:
E1c    ||                         ||                           ||
F1a    :                         :                           :
F1b    :                         :                           :
F2     :                         :                           :
F3     Ø                         Ø                           Ø
J2c    ------------------------- -------------------------
       mat'aw:                      mat'owa:g                    mat'owe:g

//qucl//  "strangle"

(nom)                      (tr)
ma    qucl                      qucl y
H1b    -------------------------
       o                         |
H7     i                         |
J4     o                         |
J5     -------------------------
       o                         |
       moqocol                    qucliy
//fireg// "search in a pile"

//me:l// "rope on sail"

(\text{tr})
\begin{align*}
\text{fireg} & \quad y \\
\text{me:l} & \quad y \\
\text{H6} & \quad i \\
\text{N2} & \quad \emptyset \\
\text{firgiy} & \quad \text{me:liy}
\end{align*}

//pezu// "fit together"

//bug// "bend"

\begin{align*}
\text{pezu} & \quad \text{pezu} \quad y \\
\text{bug} & \quad y \\
\text{F1a} & \quad : \\
\text{F2} & \quad : \\
\text{F3} & \quad \emptyset \\
\text{Glc} & \quad a \\
\text{Hla} & \quad \text{pe:z} \quad \text{pazuy} \quad \text{buguy}
\end{align*}
//qaru//  "stir up"

<table>
<thead>
<tr>
<th>(nom)</th>
<th>(tr)</th>
<th>(redup)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ma qaru</td>
<td>qaru y</td>
<td>qaru</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rlm</th>
<th></th>
<th>qar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dla</td>
<td>a</td>
<td>a</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F</th>
<th>: Ø</th>
<th>: Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>maqar</td>
<td>qaruy</td>
<td>qarqa:r</td>
</tr>
</tbody>
</table>

//maruwel://  "work"

<table>
<thead>
<tr>
<th>(indep)</th>
<th>(tr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>maruwel:</td>
<td>maruwel: y</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F</th>
<th>: Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>H6</td>
<td>i</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N2</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>marwe:l</td>
<td>maruwliy</td>
</tr>
</tbody>
</table>

//qurf//  "burn"

<table>
<thead>
<tr>
<th>(tr)</th>
<th>(tr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>qurf</td>
<td>qurf eg:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F</th>
<th></th>
<th>qurf y</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a</td>
<td>u</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>H7</th>
<th>quruf</th>
<th>qurfiy</th>
</tr>
</thead>
<tbody>
<tr>
<td>qurfe:gi</td>
<td>qurfiy</td>
<td></td>
</tr>
</tbody>
</table>
"deliberate"

\[
\begin{align*}
\text{(indep)} & \quad \text{(tr)} \\
go:\text{np}' & \quad \text{go:\text{np}' } y \\
\text{H3} & \quad \text{i} \\
\text{H7} & \quad \text{go:\text{np}' iy}
\end{align*}
\]

"encircle, form a circle"

\[
\begin{align*}
\text{(indep)} & \quad \text{(tr)} \\
\text{laŋb} & \quad \text{laŋb } y \\
\text{H5} & \quad \text{i} \\
\text{H7} & \quad \text{laŋbiy}
\end{align*}
\]

"blow, swell up"

\[
\begin{align*}
\text{(caus)} & \quad \text{(tr)} \\
paw & \quad \text{paw nag: } y \\
\text{A2} & \quad \text{paw } \phi \\
\text{F} & \quad \text{paw} \\
\text{J2c} & \quad \text{paw} \\
\text{K2a} & \quad \text{paw} \\
\text{po:na:g} & \quad \text{po:y}
\end{align*}
\]
//pardeq// "bump against"

```
\[
\begin{array}{c}
\text{(indep)} \\
\text{pardeq} \\
\text{Elb} \\
\text{Gla} \\
\text{H6} \\
\text{pardeq} \\
\end{array}
\quad
\begin{array}{c}
\text{(tr)} \\
\text{pardeq} \\
\text{i} \\
\text{i} \\
\text{pardeq} \\
\text{pardiqiqy}
\end{array}
\]
```

//le:p ~ le:pe:// "twist"

```
\[
\begin{array}{c}
\text{(indep)} \\
\text{le:p} \\
\text{Bl} \\
\text{F} \\
\text{le:p} \\
\end{array}
\quad
\begin{array}{c}
\text{(tr)} \\
\text{le:p} \\
\text{e} \\
\text{:\small\emptyset} \\
\text{le:pe:} \\
\text{le:pe:g} \\
\text{le:pe:y}
\end{array}
\]
```

//garge:l// "born, bear"

```
\[
\begin{array}{c}
\text{(indep)} \\
\text{garge:l} \\
\text{Elb} \\
\text{F} \\
\text{garge:l} \\
\end{array}
\quad
\begin{array}{c}
\text{(tr)} \\
\text{garge:l} \\
\text{e} \\
\text{:\small\emptyset} \\
\text{garge:l} \\
\text{garge:le:g}
\end{array}
\]
```
//miza//  "hide"

<table>
<thead>
<tr>
<th></th>
<th>(indep)</th>
<th>(tr)</th>
<th>(tr)(t.m.) (pl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dlb</td>
<td></td>
<td>miza g:</td>
<td>-miza g: e: d:</td>
</tr>
<tr>
<td>Fla</td>
<td></td>
<td>ä:</td>
<td>ä:</td>
</tr>
<tr>
<td>F2</td>
<td></td>
<td>,</td>
<td>,</td>
</tr>
<tr>
<td>F3</td>
<td>Ø</td>
<td>Ø</td>
<td>Ø</td>
</tr>
<tr>
<td>G4b</td>
<td></td>
<td></td>
<td>-mizige:d</td>
</tr>
<tr>
<td></td>
<td>mi:z</td>
<td>miza:g</td>
<td></td>
</tr>
</tbody>
</table>

//fål://  "open (a basket)"

//fil//  "pick coconut"

<table>
<thead>
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<th>(t.m.) (pl)</th>
<th>(t.m.) (pl)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>fål:</td>
<td>-fål: e: d:</td>
<td>-fil e: d:</td>
</tr>
<tr>
<td>F2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td>Ø</td>
<td>Ø</td>
<td>Ø</td>
</tr>
<tr>
<td>G4b</td>
<td></td>
<td>i</td>
<td></td>
</tr>
<tr>
<td></td>
<td>fäl:</td>
<td>-file:d</td>
<td>-file:d</td>
</tr>
</tbody>
</table>

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//fai//  "find, pick up"

<table>
<thead>
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<th>(indep)</th>
<th>(i.m.) (pl)</th>
<th>(tr)(t.m.) (pl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>fai</td>
<td>-fai  ga  d:</td>
<td>-fai  η  e:  d:</td>
</tr>
<tr>
<td>A1</td>
<td>e:</td>
<td>e:</td>
</tr>
<tr>
<td>Ela</td>
<td>e:</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fay</td>
<td>-fæ:ga:d</td>
<td>-fe:ŋe:d</td>
</tr>
</tbody>
</table>

//qe:w//  "pole (for knocking down fruit)"

<table>
<thead>
<tr>
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<th>(tr)</th>
<th>(tr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>qe:w</td>
<td>qe:w g:</td>
<td>qe:w eg:</td>
</tr>
<tr>
<td>A3</td>
<td>o:</td>
<td>o:</td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>qe:w</td>
<td>qo:g</td>
<td>qo:we:g</td>
</tr>
</tbody>
</table>

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(nom) (tr)

ma qe:w g:
A3 o:
F o:
J3
J5 o
moqo:g

//sai// "split"

(indep) (tr) (nom)

sai saiy sai w
A1 e: e:
L3 y

say se:y se:w

(nom) (tr) (redup)

sai w eg:
Rm2 e:.
A1 e:
A3 o: o:
F :Ø
L2 sô:we:g

sai w eg:
se:sô:we:g
//ma-// (nominalizer)

"twist"

\[
\begin{array}{c}
\text{ma} \quad \text{le:p} \\
\hline
\end{array}
\]

"bend"

\[
\begin{array}{c}
\text{ma} \quad \text{bug} \\
\hline
\emptyset \\
\end{array}
\]

C1

\[
\begin{array}{c}
\text{male:p} \\
\hline
\end{array}
\]

"tear" (tr)

\[
\begin{array}{c}
\text{gucz} \\
\hline
\emptyset \\
\end{array}
\]

H1b

\[
\begin{array}{c}
\hline
\end{array}
\]

H7

\[
\begin{array}{c}
i \\
\hline
\emptyset \\
\end{array}
\]

J4

\[
\begin{array}{c}
\hline
\emptyset \\
\end{array}
\]

J5

\[
\begin{array}{c}
gucziy \\
\hline
\end{array}
\]

mogocoz

"close" (tr)

\[
\begin{array}{c}
\text{ni} \quad \text{ŋ} \\
\hline
\end{array}
\]

"open"

\[
\begin{array}{c}
\text{ma} \quad \text{ni} \\
\hline
\end{array}
\]

\[
\begin{array}{c}
\text{ma} \quad \text{bi} \\
\hline
\emptyset \\
\end{array}
\]

Dla

\[
\begin{array}{c}
\hline
\end{array}
\]

F

\[
\begin{array}{c}
\text{niŋ} \\
\hline
\end{array}
\]

\[
\begin{array}{c}
\text{ma:n} \\
\hline
\end{array}
\]

\[
\begin{array}{c}
\text{ma:b} \\
\hline
\end{array}
\]
"send on an errand"

1'o: g

J3

J5

1'o: g

ma 1'o: g

o

o

mol'o: g

"peel" (tr)

qolo: y

ma qoloi

A4

o:

J5

L3

Q1a

o

qolo: y

moqoloy
//ma- ~ m-// (nominalizer)

<table>
<thead>
<tr>
<th>&quot;suck (obscene)&quot;</th>
<th>&quot;follow&quot;</th>
<th>(tr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>m qun</td>
<td>ma qun</td>
<td>qun y</td>
</tr>
<tr>
<td>Hla</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J5</td>
<td>o</td>
<td></td>
</tr>
<tr>
<td>Mld</td>
<td>u</td>
<td></td>
</tr>
<tr>
<td></td>
<td>muqun</td>
<td>moqun</td>
</tr>
<tr>
<td></td>
<td></td>
<td>qunyu</td>
</tr>
<tr>
<td>&quot;boil&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ligil</td>
<td>m ligil</td>
<td></td>
</tr>
<tr>
<td>Mla</td>
<td>i</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ligil</td>
<td>miligil</td>
</tr>
</tbody>
</table>
//da// (l.in)

(incep) "talk" (pl)

ηa da no:no d:

Bl
F1b ∅
F2, 3 : ∅

ηadno:no:d

(past) "turn" (tr) (t.m.) (pl)

ka da ce:1 e;g e: d:

Bl
F1b ∅
F3 ∅
Plc c

kacce:le:ge:d
//ŋa// (incept)

(2.) "swim"

ηa m no:ŋ

"come"

ηa mu ba

ηamno:ŋ

ηamub

(3.sg)

ηa i no:ŋ

"talk"

ηa i no:no

Al

ηe:

Ela

ηe:

F

ηe:no:ŋ

ηe:no:n

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//ka ~ ku/ (past)

(perf) (1.sg) "swim"

ka qa gu no:ŋ

B2

F1b o

J3

koqogno:ŋ

B2 is sporadic. When it does not operate in the above word, J3 cannot act either. The result is /kaqagno:ŋ/.

(hab) (l.in) (i.m.) (pl)

ku qu da no:ŋ ga d:

F1b

0

F2, 3

kuqudno:ŋga:d
(perf) (3.sg)

ka qa i no:ŋ

A1

Ela

F

J2a

e

J2b

keqe:no:ŋ

ku qu i no:ŋ

A5

J1

i

kiqi:no:ŋ

ka qa i no:no

e:

E:

∅

keqe:no:n

ku i no:ŋ

E:

i:

ki:no:ŋ

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// o:n' ~ n': ~ in'a/ "throw"

\begin{align*}
\text{(incep) (1.ex)} & \quad \text{(incep) (3.) (t.m.) (pl)} \\
\eta a & \quad \eta a \\
gu & \quad ra \\
o:n' & \quad o:n' \quad e: \quad d: \\
\hline \\
C1 & \quad \emptyset & \quad \emptyset \\
F1c & \quad \emptyset & \quad \emptyset \\
F3 & \quad \eta goat:n' & \quad \eta row:n'e:d \\
\hline
\text{(indep)} & \quad \text{(3.sg)} & \quad \text{(incep) (3.sg)} \\
o:n' & \quad i & \quad \eta a \\
i: & \quad o:n' & \quad i \\
y & \quad e: & \quad y \\
\hline \\
A1 & \quad \emptyset & \quad \emptyset \\
L1a & \quad \emptyset & \quad \emptyset \\
L1b & \quad \eta y:n' & \quad \eta e:y:o:n' \\
\hline
\text{(incep) (1.ex)} & \quad (2.) \\
\eta a & \quad \eta a \\
gu & \quad mu \\
n': & \quad n': \\
\hline \\
C1 & \quad \emptyset & \quad \emptyset \\
F & \quad : \quad \emptyset \\
\eta gu:n' & \quad \eta gmu:n' \\
\end{align*}
(1.sg)  (3.sg)  (past)(3.sg)

\[
\begin{array}{c|c|c}
\text{Al} & \text{in'a} & \text{g;} \\
\text{Dlb} & \ddagger & \text{a} \\
\text{F} & : \emptyset & : \emptyset \\
\text{Lla} & & \text{y} \\
\text{L1b} & \text{y} & \text{y} \\
\text{yin'a:g} & \text{yi:n'} & \text{ke:yi:n'}
\end{array}
\]
//iba ~ ba/ "come" (dialect variation)

(incep) (3.sg)

Al
Ela
F
Ll

\eta\text{i} \quad \text{iba} \quad \eta\text{i} \quad \text{ba}

e: \quad \epsilon: \quad \epsilon: \quad \epsilon:

: \emptyset \quad \emptyset

\eta\text{e}:\text{yi:b} \quad \eta\text{e}:\text{b}
VI. Appendix.

Bibliography


Index of morphophonemic rules

The morphophonemic rules discussed in Chapter III are assembled in order here in a compact form more convenient for reference. The notation is the horizontal one described in the introduction to that chapter.

A1. (ai > e:)-
A2. (aw > o:)y
A3. (e:w > o:)-
A4. (oi > o:)y
A5. (ui > i:)C
B1. aCC(e > e):Ce
B2. (a > o)gu (sporadically)
C1. #(m,n)(V > )CV- C homorganic with previous consonant.
Dla. (a > o)D(i,u)# D#y
Db. (u, o, i)(:)D(a > o)C
Dc. y(a > o)D
El. (e > e)(:)C(o, a, e) (apply retrogressively)
Elb. (a, o, e, a)(:)C(e > e)C
Elc. (a, o, e, a)(:)C(V, :)|(e > e)C
F1a. V(; )C(V > :)#
F1b. V(; )C(V > )|CV(; )C (apply retrogressively)
F1c. -C(V > )|V
F2. V( > :)C:#
F3. C( > )
G1a. (e > i)q(y, i)
G1b. \((e > u)wV\)
G1c. \((e > a)(C)CV\)
G1d. \((\ddot{e} > a)(C)CV\)
G2. \(C(o > a)CV\) \(\forall o, u, \ddot{o}, \ C \neq w\)
G3a. \((\ddot{o} > a)\ddot{e}\)
G3b. \((\ddot{o} > u)CV\)
G4a. \(w(\ddot{a} > u)CV\)
G4b. \((\ddot{a} > i)CV\)
G4c. \((\ddot{a} > a)CV\) (sporadically in a few words)
H1a. \(u(:)C_{1}( > u)(B,y)#\) \(C_{1} \neq w\)
H1b. \(u(:)C_{1}( > o)C_{2}#\) \(C_{1} = w\) or \(C_{2} \neq B,y\)
H3. \(o(:)C( > o)C#\)
H4. \(\ddot{a}(:)C( > \ddot{o})C#\)
H5. \(a(:)C( > a)C#\)
H6. \((i,e,\ddot{e},\ddot{a})(:)C( > i)y#\)
H7. \(CC( > i)y#\)
J1. \((u > i)qi\)
J2a. \((a > e)qe\)
J2b. \((a > \ddot{e})q\ddot{e}\)
J2c. \((a > o)w\)
J3. \(aC(\ddot{a} > o)\quad C = \text{stop or glottalized consonant.}\)
J4. \(a\lvert(q,g)(u > o)C-\)
J5. \((a > o)(\lvert)(q,g,C',r)(\lvert)(u,o)\quad \text{where at least one of the}\)
\text{indicated morpheme boundaries is present.} \(C'\) \text{is a cover}\n\text{symbol for glottalized consonants.}\)
K1. \((a > \ddot{e})yC\)
K2a. \[ V(y,w > :)C \]
K2b. \[ V:(y,w > )C \]
L1a. \[ #(i > y)(\bar{i},i) \]
L1b. \[ (#,i,e)(:) ( > y)(i,\bar{a},o) \]
L2. \[ (u,\bar{o},o)(:) ( > w)(i,e) \]
L3. \[ V(:)(i > y)(C,#) \]
L4. \[ V(:)(u > w)(C,#) \]
M1a. \[ #C ( > i)C(e,i) \text{ C's are not homorganic in all rules Ml.} \]
M1b. \[ #C ( > a)C(a,o) \]
M1c. \[ #C ( > \bar{o})C\bar{o} \]
M1d. \[ #C ( > u)Cu \]
M1e. \[ #C ( > o)(q,s,r)o \]
M2. \[ V_1C_1( > V_1)C_2^- \text{ C}_1 \text{ = stop or glottalized consonant; } C_1, C_2 \text{ not homorganic.} \]
N1. \[ #(b,m,l,r,g,\eta)(V > )C_2^- C_2 \text{ is homorganic with the initial consonant. Dentals and palatals are considered homorganic here.} \]
N2. \[ -V(:)C_1(V > )C_2^- \text{ (apply retrogressively)} \]
P1a. \[ (d > t)(t,t') \]
P1b. \[ (d > z)(z,z') \]
P1c. \[ (d > c)c \]
P1d. \[ (d > s)s \]
P2a. \[ (n > l)l \]
P2b. \[ (n > )\eta \]
P3. \[ (g > k)(k,k') \]
Q1a. \[ (o > \bar{o})\bar{o} \]
Q1b. \((i, \tilde{a}, u)(;)(D)(o > o)\)

S1. \(D(\tilde{a} > e):D(D)(V)\)

R1. \(CV(V;,)C-\) (reduplication of initial closed syllable)

R2. \(CV(V;,)C-\) (reduplication of initial open syllable)

R3. \(-CVC\) (reduplication of final syllable)
### Index of abbreviations

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<td>impersonal: //n- ~ -y//. IV.1.</td>
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<td>nominalizing prefix or suffix: //m- ~ -w//. IV.4.</td>
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<td>perfective: //qa//. IV.5.</td>
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<tr>
<td>pl</td>
<td>plural marker: //d//: IV.1.</td>
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<td>possessive stem //ro//, possessive construction (using ro:-). IV.1, 2.</td>
<td></td>
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<td>p.s.</td>
<td>subject or independent pronoun stem: //g ~ Ø//. IV.1.</td>
<td></td>
</tr>
</tbody>
</table>
redup
sthg
transitive marker: //e://. IV.1.
tr., trans
transitive, transitivevizer (transitive suffix).
IV.3.
voc
vocative form of personal name.
1.ex
1st. person exclusive: //ma ~ gu/>. IV.1.
1.in
1.sg
1st. person singular attributive suffix: //g/>. IV.1, 2.
2.
2nd. person: //me: ~ mu ~ m/>. IV.1.
2.sg
2nd. person singular attributive suffix: //m/>. IV.1, 2.
3.
3rd. person, in dual and plural: //ya ~ ra/>. IV.1, 2.
3.sg
3rd. person singular: //i ~ na/>. IV.1, 2.