

A PAPAGO GRAMMAR

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Submitted to
the faculty of the Graduate School
in partial fulfillment of
the requirements for the degree,
Doctor of Philosophy,
in the Department of Linguistics,
Indiana University
1959

Accepted by the faculty of the Graduate School, Indiana University, in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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ACKNOWLEDGEMENTS

I wish to thank C. F. Voegelin, chairman of my doctoral committee, for continued stimulation and encouragement and many constructive suggestions. I also wish to thank the members of my committee, all of whom have been helpful with advice and instruction during the writing of my thesis.

I am grateful to Indiana University for the financial assistance which made possible my study at the University and two summers' field work with the Papagos in Arizona.

PREFACE

This dissertation is a structural statement of a dialect of Pima-Papago, based on two summers' field work with informants living, as their ancestors lived, in Arizona and in northern Sonora, Mexico.

My principal informant was Mr. Luke Preston who was born at Sekil Himitk (~~sikoli~~---~~himidiki~~ where it goes around), near Sells, Arizona, around the year 1884. When he was five years of age, he and his family moved to Sacaton Flats where they lived among the Pimas; he stayed there until 1915 when he moved to San Xavier (near Tucson, Arizona) where he is now living.

The dialect represented by this study is Totokowani (~~toto-giwani~~) spoken in a triangular area having its northeastern apex at San Xavier, its northwestern apex at Santa Rosa and its southern apex on the international border at a point just east of San Miguel.

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Chapter I

	Page
1. Phonemics	1
1.1. Suprasegmental phonemes	3
1.2. Segmental phonemes	5
1.3. Distribution of phonemes	24

Chapter II

2. Morphophonemics	34
2.1. Phonologically determined alternation	36
2.2. Morphologically determined alternation and unproductive alternation	48

Chapter III

3. Major stems and affixes	71
3.1. Verbs	83
3.2. Nouns	136
3.3. Attributes	146

Chapter IV

4. Minor stems and affixes	156
4.1. Pronouns	159
4.2. Spatialis	177
4.3. Quantifiers	179

CHAPTER I

PHONEMICS

1. A stretch of speech activity produced by a given speaker, and not interrupted by another speaker, is here termed an **UTTERANCE**. An utterance is bounded by silence on the part of the speaker. This is an operational definition which includes all stretches elicited from a native speaker of a language by an investigator using any stimulus whatever. Stimuli may be pictures concerned with domain topics, questions of the type "how do you say ...", conversations, requests for short texts concerning specific domains such as farming, cattle raising, medicine, technology, etc. Spoken stimuli may be in the native speaker's own language or in any other language.

A given utterance, in Papago, may be interrupted by long or short, but always clearly audible, pauses. Any stretch of speech activity which does not contain a pause, but which extends between utterance initial silence and a pause, between pauses, or between a pause and utterance final silence, is here termed a **CONTOUR**. Any stretch which includes a whole contour, or a partial thereof, is termed a **SEQUENCE**.

The matrix of phoneme distribution is equivalent to the contour, hence, the occurrence of a given phoneme initially, medially, or finally, is in respect to the contour.

Within a contour, certain phonemically minimal segments

are definable in terms of such features as (1) relative loudness, (2) high versus low pitch or movement of pitch from high to low, or (3) complete absence of phonation (on the part of a given speaker). Phonemes which are defined by one or a composite of these features are here termed **SUPRASEGMENTAL PHONEMES**.

Within a contour, there always occur, in addition to one or more suprasegmental phonemes, several phonemically minimal segments which are definable in terms of various articulatory features such as (1) stoppage or constriction of egressive lung air at one or more of several points (positions) in the speech tract (features distinguishing sets of consonants), (2) oral versus nasal passage of lung air (features distinguishing sets of consonants), (3) openness versus closeness of the oral cavity and frontness versus backness of the tongue (distinguishing sets of vowels), (4) fortis versus lenis articulation (distinguishing sets of consonants), and (5) short versus long duration (i.e., relative length of unit segments---distinguishing sets of vowels). Phonemes which are defined in terms of composites of certain of these features are labeled **SEGMENTAL PHONEMES**.

A contour always includes at least one suprasegmental phoneme and at least two segmental phonemes (every contour begins in a consonant and ends in a vowel).

This chapter is divided into three sections. Section 1.1. describes the various suprasegmental phonemes; section 1.2. describes the various segmental phonemes, and section 1.3. treats

the distribution of the segmental phonemes in terms of their occurrence in position relative to contour boundaries and to each other.

1.1. Every contour is preceded and followed by absence of phonation (of short or long duration) on the part of a speaker producing a given utterance. Cessation in phonation which, in a given instance, defines a contour, is termed CONTOUR DEFINING PAUSE and is symbolized in the phonemic notation as /#/. An occurrence of /#/ is always preceded by low or falling pitch.

Within a given contour (i.e., between successive instances of /#/), one or several vowels may be high in pitch (or show a fall in pitch from high to low). Of the high-pitched vowels occurring in a contour, at least one is stressed, i.e., louder than surrounding vowels. A stressed vowel is always high in pitch (at some point in its duration), and it may be the only high-pitched vowel in the contour or one of several. The vocalic locus of stress in a given contour is unpredictable and is therefore supplied with a phonemic notation / \acute{V} / hereinafter labeled STRESS. The unit of stress placement is equivalent to a single vowel.

The pitch of vowels in a sequence extending between /#/ or / \acute{V} / and a following / \acute{V} / may be as high as the stressed vowel, or it may be quite low for some duration and rise suddenly (without pause) at a point which may or may not be coincident with the following / \acute{V} /. A low pitched sequence preceding a rise in pitch (and not separated therefrom by pause) is supplied with the phonemic notation / \downarrow /, termed CONTOUR-

INCLUDED JUNCTURE (written immediately before the rise in pitch following one or more low pitched vowels).

Three suprasegmental phonemes have been set up in the immediately preceding paragraphs: contour defining pause /#/, contour-included juncture / ↓ /, and stress / ˘ /.

Having set up these phonemes, it is possible to define and describe all stress-pitch patterns associated with a given contour in Papago. The immediately following paragraphs (1, 2, 3) characterize and exemplify the suprasegmental phonemes established above. Spaces written in examples have no phonemic value, being written between morphologically free elements. Subphonemic representation is given in consonant-vowel interphonemic specification. The onsets of low-pitched sequences, high-pitched sequences, or sequences showing pitch movement from high to low are specified in superscript as L(ow)...., H(igh)...., and H(igh)-L(ow)... respectively.

(1) A sequence, containing no stressed vowels, which extends between / # / and a following / ↓ / or between successive occurrences of / # / is low in pitch and exhibits a short drop in pitch from beginning to end.

/# ʔani ki ↓ kókʂa·#/ [#Lcvcv cv ↓ H-LcṽLcv·#] I am apparently dozing.

/# kut o·# / [#Lcvc v·#] And then (you) should (verb).

/# ʔal ʔatɪ ↓ čámida·#/ [#Lcvc cvcv ↓ H-Lcṽ cvcv·#]
It has become small.

/# napitɪ pi· ʔam ↓ hú wo· hí·#/ [#Lcvcvcv cv· cvc ↓

HcV cv. H-LcV. #] Aren't you going to go over there?

(2) A sequence, containing no stressed vowel, which extends between / V / and a following / ↓ / or / # / is low in pitch and is preceded by a long drop in pitch perceptible on the stressed vowel. A stressed vowel immediately followed by / ↓ / or / # / (only long vowels so occur) exhibits a long drop in pitch extending through its entire duration.

/ # čiki ?andi gi ↓ nháiwani ga. # / [# H-LcV LcV CVCCV CV ↓
cH-LcV LcV CVCCV. #] I vaccinated my cow.

/ # ni. ↓ sóni widi gi ↓ wihogi # / [# LcV. ↓ H-LcV LcV CVCCV CV ↓
H-LcV LcV CV #] Pound the mesquite beans for me!

/ # čikapanani # / [# H-LcV LcV CVCCV CV #] You (sg.) work !

(3) A sequence, containing no / V / or / ↓ /, which extends between / ↓ / or / # / and a following / V / or between successive occurrences of / V / exhibits high level pitch as high as that of the following / V /.

/ # napiti ↓ kói ?am hú ?ú. pami wúa. # / [# LcV CVCCV ↓
HcV CV CV CV. CVCCV H-LcV LcV. #] Did you put it back yet?

/ # kakadodi. ?and ↓ há?i ?úi # / [# HcV CV H-LcV LcV. CVCC ↓ HcV CV H-LcV #] I got some marbles.

/ # ?i. da? a ↓ papaló. di. ?o. ↓ pi. čikapani # / [# H-LcV. LcV CV ↓ HcV CV H-LcV. LcV. CV. ↓ HcV. H-LcV LcV CVCCV #] This windmill is not working.

/ # wáiko. wístimá. mǎ gamai hámako. # / [# HcV CV. CVCCV CV: CV CVCCV H-LcV LcV CV: #] Thirty-one.

1.2. The inventory of Papago segmental phonemes and the distribution of their allophones are presented in this section.

The inventory is presented according to a system of inter-phonemic specification which groups phonemes into sets based on position (indicated in the specification by numerals) and manner (indicated by abbreviations) of articulation.

Phonemes which are defined in terms of several of the articulatory features of stoppage or constriction of lung air, oral versus nasal passage of lung air, or fortis versus lenis articulation are labeled CONSONANTS (symbolized C).

Stop consonants (C^{st}) appear with oral passage of lung air and stoppage at bilabial (symbolized by the numeral 1), dental (2), alveolar (2^+), alveopalatal (3), velar (5), or glottal (6) positions of articulation. Stops in positions 1, 2, 3, and 5 occur in homorganic pairs, contrasting as fortis (C^p) and lenis (C^b). Stops in positions 2^+ and 6 are respectively C^d (alveolar stop with some retroflexion) and $C^?$ (glottal stop); they are not paired by other stops. The inventory of stops is as follows: four C^p (at 1, 2, 3, 5) = / p, t, č, k /; four C^b (at 1, 2, 3, 5) = / b, d, ě, g /; one C^d (at 2^+) = / ḍ /; one $C^?$ (at 6) = / ʔ / = ten stops in all.

Fricatives (C^f) appear with oral passage of lung air and constriction at alveolar (2^+), prepalatal (with retroflexion) (3^+), and glottal (6) positions of articulation. The inventory of fricatives is as follows: three C^f (at 2^+ , 3^+ , 6) = / s, š, h / = three fricatives in all.

Nasals (C^n) appear with nasal passage of lung air and oral stoppage at bilabial (1), dental (2), and alveopalatal

(3). positions of articulation. The inventory of nasals is as follows: three C^n (at 1, 2, 3) = / m, n, ŋ / = three nasals in all.

One lateral (C^l) occurs with oral passage of lung air and stoppage (with flap release) at alveolar position (2^+) and passage of air at lateral position (4): one C^l (at 2^+-4) = / l / = one lateral in all.

Semivowels (C^{SV}) appear with oral passage of lung air and loose constriction at bilabial (1) and alveopalatal (3) positions of articulation: two C^{SV} (at 1, 3) = / w, y / = two semivowels in all.

The total inventory of papago consonant phonemes is presented in linear form as follows: / p, t, č, k, b, d, ɖ, ʒ, g, ʔ, s, ʂ, h, m, n, ŋ, l, w, y / = 19 for all C. In the inter-phonemic specification used in following subsections and in Chapter II. (Morphophonemics), consonants which are voiceless in all occurrences (p, t, č, k, s, ʂ, g) are specified as $C^v(oice)l(ess)$; the remaining consonants, including those which are voiced in some or all of their occurrences (b, d, ɖ, ʒ, g, m, n, ŋ, l, w, y) and the glottal stop (ʔ), are specified as $C^v(oiced)$. This specification is useful in the notation of environments both for the distribution of allophones and for that of morpheme alternants (see 2.).

Phonemes which are defined by the features of openness versus closeness of the oral cavity, frontness versus backness of the tongue, and relative long versus short duration are labeled VOWELS (V). All vowels may combine with stress / \acute{V} /.

Vowels occur in pairs contrasting as long and short. Two vowels (one long and one short) are high front: / i, i[•] /. Two vowels are high central / ɨ, ɨ[•] /; two are high back / u, u[•] /; two are low central / a, a[•] /, and two are low back / o, o[•] /. All back vowels are rounded, and all front and central vowels are unrounded. The inventory of vowel phonemes is presented in linear form as follows: /i, i[•], ɨ, ɨ[•], u, u[•], o, o[•], a, a[•]/ = 10 for all V.

Vowel clusters (VV) move from high-front (short) to high-back (short), low-back (short), or to low-central (long or short) = /iu, io, ia, ia[•]/; from high-central (short), high-back (short), low-back (short), or low-central (short) to high-front (short) = /ɨi, ui, oi, ai /; from high-back (short) to low-central (long or short) = ua, ua[•] /; from high-central (short) or low-central (short) to high-back (short) / ɨu, au /. The inventory of vowel clusters is presented in linear form as follows: / iu, io, ia, ia[•], ɨu, ɨi, ui, ua, ua[•], oi, ai, au / = 12 for all VV.

The description and distribution of Papago segmental phonemes are presented in two subsections, 1.2.1. (consonants) and 1.2.2. (vowels), below. Environments in which allophones of the phonemes occur are specified and represented by means formulae involving the interphonemic specification adopted above. A phoneme or set of allophonically similar phonemes under discussion in a given instance is represented by a dash (...__...). Phonemic material which need not be specified for the particular environment being specified in a given instance

is omitted in the formulae; its omission is represented by three dots (...). The juncture /# / is written in certain formulae where it has its phonemic value as attested in 1.1. Phonemic notation is inclosed in diagonals /.../, and phonetic notation is inclosed in brackets [...]. Preceding and following /# / are assumed but not written in actual examples.

1.2.1. The present subsection is concerned with environments in which allophones of the various consonant phonemes occur. Five sets of phonemes, grouped on the basis of allophonic similarity and without regard to manner subclass are treated in separate parts below.

1.2.1.1. The consonants treated in the following paragraphs include the fortis stops (C^P in the specification) and fricatives (C^f). Members of C^P and C^f are voiceless (C^{v1}) in all environments, and they share, in all medial environments, the feature of voiceless approach (see below).

The stops / p, t, č, k / (C^P) are produced at bilabial (1), dental (2), alveopalatal (3), and velar (5) positions of articulation respectively. They occur initially (/# __... /) and medially (/ ...__.../) and appear as fortis voiceless [p, t, č, k] in both environments.

The fricatives / s, š, h / (C^f) are produced at alveolar (2^+), prepalatal (with retroflexion) (3^+), and glottal (6) positions of articulation respectively. They occur initially (/# __... /) and medially (/...__... /) as voiceless [s, š, h] in both environments.

In medial environments, the stops C^P and fricatives

C^f are characterized by a feature termed here voiceless approach. That is, in medial environments, they are always preceded by fully or partially voiceless phones. Phonemes which may precede C^D or C^f appear as fully or partially voiceless in that environment.

Examples of C^D and C^f are given in two groups of paragraphs below; the first group gives examples of C^D and C^f in initial position, while the second group exemplifies medial position.

/#___... /:
 / pí[?]a / [pí[?]A] no, / pá·lɨ / [pá·Lɨ] priest, / pó·tolɨ /
 [pó0toLɨ] brone;
 / túa / [túA] acorn, / táI / [táI] fire, match(s),
 / tó·ná / [tó·Nɨ] knee;
 / čúkuɨ / [čú^hku[?]tɨ] owl, / číhanɨ / [číhanɨ] to hire, buy, / čí·čɨ / [číɨčɨ] to name, non-present;
 / kái / [káI] seed(s), / kúi / [kúI] mesquite tree,
 / kí· / [kíI] house;
 / sú·na· / [sú·naA] fig(s), / sí·lɨ / [sí·Lɨ] saddle,
 / sá·nto· / [sá·Nto0] Catholic;
 / šú·gɨ / [šú·Gɨ] mocking bird, / šáliwɨ / [šáliWɨ] pants,
 / šá·[?]ɨ· / [šá·[?]ɨɨ] wolf.
 / hú·ná / [hú·Nɨ] corn, / há·šanɨ / [háAšanɨ] saguaro,
 / hí·kɨ / [híIkɨ] to mow, cut hair.
 / ...___... /:
 / tá·panɨ / [táApanɨ] to split, / wípšɨ / [wí^hpšɨ] wasp, hornet, / kámpanɨ / [káMpanɨ] bell;

/ ?áti / [?á^htɪ] anus, / bí·tɪ / [bíItɪ] excrement,
to excrete, / kúntɪ / [kúNtɪ] to take a husband;

/ sɪwá·čɪ / [sɪwáɪčɪ] heavy, / kómikičudɪ /
 [kómɪkɪčú^tɪ] turtle, / wáncɪkɪ / [wáNčɪkɪ] to pull and
break;

/ ?áki / [?á^hkɪ] wash, arrollo, / žú·ki / [JuUkɪ]
rain, / múmɪku· / [múMɪkuU] sick.

/ ?ú·sɪ / [?úUsɪ] stick, / há·sa· / [háAsaA] axe,
 / maNsá·na· / [maNsá·naA] apple;

/ ?ú·sɪ / [?úUsɪ] scorpion's stinger, arrowhead,
 / wɪsagɪ / [wɪ^hsagɪ] hawk, / mímsɪ / [mímʃɪ] Protestants.

/ há·hagɪ / [háAhaGɪ] leaf, leaves, / mú·kihimɪ /
 [múUkɪhɪmɪ] to die, single actor, progressive, / málhogɪ /
 [málhoGɪ] ocotillo.

1.2.1.2. Consonants treated immediately below are the stops specified as C^b. Each member of C^b has two allophones occurring in non-overlapping distribution.

The stops / b, d, ž, g / (C^b) are produced at bilabial (1), dental (2), alveopalatal (3), and velar (5) positions of articulation. They occur initially (/#__... /) and medially (/ ...__... /) and are lenis in both environments. In medial environments, members of C^b are always preceded by fully voiced phones, and are therefore said to have voiced approach (in contrast to the voiceless approach characterizing medial C^p and C^f).

Members of C^b appear as fully voiced [b, d, ž, g] in some environments and as voiceless [B, D, J, G] in certain

others. Environments in which each of these sets of allophones (the voiced set and the unvoiced set) occur are specified in six statements, (a) through (f), below.

Environments in which C^b appear as voiced [b, d, ʒ, g] are: (a) between an unstressed vowel (\check{V}) and a following / $\check{V}^v\dots$ / (sequence of phonemes beginning in an unstressed vowel and in which that vowel appears as voiced, see 1.2.2. for environments in which voiced and voiceless allophones of the various vowel phonemes occur) (specified in environmental formula as / $\dots\check{V}_\check{V}^v\dots$ /); (b) between a nasal (C^n) and a following / $\check{V}^v\dots$ / (/ C^n) and a following / $V^v\dots$ / (/ $C^n_\check{V}^v\dots$ /).

Environments in which C^b appear as voiceless [B, D, J, G] are: (c) initially (/ # $_\dots$ /); (d) contiguous to a stressed vowel (/ $\dots\acute{V}_\dots$ /, / $_\acute{V}\dots$ /); (e) before a consonant (/ $__C\dots$ /); (f) before / $\check{V}^{v1}\dots$ / (a sequence of phonemes beginning in an unstressed vowel and in which that vowel appears as fully voiceless, see 1.2.2.) (/ $_\check{V}^{v1}\dots$ /).

Examples of C^b are presented in two groups of paragraphs below; the first exemplifies the voiced allophones and the second exemplifies the voiceless allophones.

[b, d, ʒ, g] :

/ $ʔóʔobab\ddot{z}$ / [ʔóʔobaBɪ] Maricopa, / $ló\cdot mbo\cdot$ /
 [ló\cdot mbo0] Jew's harp, top;

/ $sás\ddot{z}ida\cdot$ / [sá^hs\ddot{z}idaA] to herd, continuative;

/ $ná\cdot nda\cdot$ / [ná\cdot ndaA] to kindle, continuative;

/ $ʔáʔa\check{z}i\check{z}\ddot{z}$ / [ʔáʔa\check{z}iJɪ] thin, plural, / $lá\cdot n\check{z}u\cdot$ /

[lá·n^YuU ranch, / mán^Y·ki/ [mán^Y·kI] baking grease;
 / ʔaʔaga· / [ʔaʔagaA] to tell, continuative.
 [B, D, J, G] :
 / bábad̩ / [BÁBaD̩] frog, / bábʂo· / [BÁBʂoO] breasts,
 / ʔó·b̩ / [ʔó·B̩] Apache, enemy;
 / dádi· / [DáD̩] to jump, fly, sg. actor, con-
tinuative, / dáds̩a· / [DáD̩s̩aA] to place, put, continuative,
 / wó·d̩ / [wó·D̩] to lay.
 / ʂúʂul̩ / [JúJuL̩] crooked, / ʂúʔuʂad̩k̩ /
 [JúʔuJʂaʔt̩k̩] loose, distributive, / ʔó·ʂ̩ / [ʔó·J̩] his back.
 / gág̩· / [GáG̩] to roast, continuative, / dágs̩p̩ /
 [DáG̩sp̩] to press, / ʔó·g̩ / [ʔó·G̩] father.

1.2.1.3. A single stop, / d̩ /, is treated in this subsection. / d̩ / has three allophones occurring in non-overlapping distribution.

The stop / d̩ / (C^d) is produced at alveolar (with some retroflexion) (2⁺) position of articulation. It occurs medially (/ ...__... /) only; it appears as fully voiced [d̩] in some environments, as voiceless with light preaspiration [ʔ̩] in some, and as lenis voiceless [D̩] in certain other environments.

Environments in which the three allophones of / d̩ / occur are specified in three paragraphs and seven statements, (a) through (g), below.

Environments in which / d̩ / appears as voiced [d̩] are:
 (a) between an unstressed vowel (V̩) and a following / V̩^v... /
 (/ ...V̩__V̩^v... /); (b) between / n / and a following / V̩^v... /

(/ n__ṽṽ... /).

Environments in which / ḍ / appears as voiceless and preaspirated [ṽṽ] are: (c) between an unstressed vowel and a following / ṽṽ^l... / (/ ...ṽ__ṽṽ^l... /); (d) before C^f (/ ...__C^f... /).

Environments in which / ḍ / appears as lenis voiceless [D] are: (e) between a stressed vowel and a following unstressed vowel (/ ...ṽ__ṽ... /); (f) between / n / and a following / ṽṽ^l... / (/ n__ṽṽ^l... /); (g) before / ʔ / (/ ...__ʔ.../).

Examples of / ḍ / are presented in three paragraphs below. The first exemplifies the voiced allophone [ḍ], the second the voiceless and preaspirated allophone [ṽṽ], and the third the lenis voiceless allophone [D].

[ḍ] :

/ mímíḍa· / [mímíḍaA] to run, sg. actor, continuative,
/ nǎ·ḍa· / [nǎ·ḍaA] to wait.

[ṽṽ] :

/ húṽuḍḍ / [húṽuṽṽ] lizard, / gákoḍḍ / [Gá^hkoṽṽ] crooked,
/ háḍspḍ / [háṽṽspṽṽ] to paste, glue.

[D] :

/ ṽḍumí / [JúḍuMṽ] bear, / mǎḍ ʔo· / [mǎḍʔoO] he is running.

1.2.1.4. Consonants treated in the immediately following paragraphs include the nasals (Cⁿ), the lateral / l / (C^l), and the semivowel / w / (C^w). Each of these phonemes has two allophones occurring in non-overlapping distribution. Members of Cⁿ, the lateral C^l, and the semivowel C^w have a voiced

approach in all medial environments; i.e., they are always preceded by fully voiced phones.

The nasals / m, n, ŋ / (C^n) are produced at bilabial (1), dental (2), and alveopalatal (3) positions of articulation respectively. They occur initially (/ # ___... /) and medially (/ ...__... /).

The lateral / l / (C^l) is produced at alveolar (2^+) position with passage of air at lateral (4) position. It is characterized by a flap release at the alveolar position. It occurs initially (/ # ___... /) and medially (/ ...__... /).

The semivowel / w / (C^w) is produced at bilabial (1) position of articulation. It occurs initially (/ # ___... /) and medially (/ ...__... /).

C^n , C^l , and C^w appears as voiceless [M, N, ŋ, L, W] in certain environments and as fully voiced [m, n, ŋ, l, w] in certain others. Environments in which each of these two sets of allophones (voiceless and voiced) appear are specified in two paragraphs and five statements, (a) through (e), below.

Environments in which C^n , C^l , and C^w appear as voiceless [M, N, ŋ, L, W] are: (a) before / \check{v}^{v1} ... / (/ ___ \check{v}^{v1} ... /); (b) before / C^{v1} / (/ ___ C^{v1} ... /).

Environments in which C^n , C^l , and C^w appear as voiced [m, n, ŋ, l, w] are: (c) before a stressed vowel (/ ___ \acute{v} ... /); (d) before / \check{v}^v ... / (/ ___ \check{v}^v ... /); (e) before / C^v / (/ ___ C^v ... /).

Examples of C^n , C^l , and C^w are presented in two groups of paragraphs below, one for each allophone.

[M, N, ŋ, L, W] :

/ kómi / [kóMI] shell, small of back, / kámpaŋi /
[kámpaŋE] bell;

/ kúni / [kúNE] husband, / kúnti / [kúntE] to take
a husband;

/ ʒúni / [ʒúNE] cactus candy, / ʒóhni / [ʒóh;NE]
to strike with the hand;

/ ʔlɪkoni / [ʔlɪkone] to skin, / ʔólɪ / [ʔólɪE]
to hook, non-present;

/ gáwítani / [Gáwítane] to whip, / gáwho· / [GáwhoO]
bobcat.

[m, n, ŋ, l, w] :

/ mámagina· / [mámaginaA] car, / ló·mbo· / [ló·mboO]
Jew's harp, top;

/ nánakɪmalɪ / [nána^hkɪmalɪE] bat, / wíndani /
[wíndaNE] window;

/ nɪ·bigɪ / [nɪ·BiGE] whale, / mánʒɪ·ki / [mánʒɪkɪE]
baking grease;

/ lílɪbi· / [lílɪbiI] orphans, / lál^ʔaspɪ /
[lál^ʔa^hspɪE] to trap, plural goal;

/ wáwani / [wáwaNE] to lay a beam, stretch,
/ čáw wíʒina· / [čáwwíʒinaA] long rope.

1.2.1.5. The remaining consonant phonemes, the glottal
stop / ʔ / and the semivowel / y /, are treated in the follow-
ing paragraphs.

The glottal stop / ʔ / (Cʔ) is produced at glottal (6)
position of articulation. It occurs initially (/#___... /) and
medially (/ ...___... /) as [ʔ] in all occurrences. It has

voiced approach in all medial environments.

The semivowel / y / (C^y) is produced at alveopalatal (3) position of articulation. It occurs initially (/ #__... /) and medially (/ ...__... /) as [y] in all occurrences. / y / has voiced approach in all medial environments.

Examples of / ʔ / and / y / are presented in two groups of paragraphs below; one exemplifies initial position, and the other exemplifies medial position.

/ #__... /:

/ ʔóksɿ / [ʔ^hoksɿ] old woman, / ʔátɿ / [ʔ^hatɿ] anus;

/ yá·wi / [yá·WI] key, / yú·sɿ / [yúUsɿ] to use.

/ ...__... /:

/ kóʔowi / [kóʔoWI] rattlesnake, / móʔo / [móʔO] head; / papayáyasó· / [pa^hpayáya^hsoO] clowns.

1.2.2. The present subsection is concerned with environments in which allophones of the various vowel phonemes occur. Five sets of vowel phonemes, grouped on the basis of their allophonic similarity, are treated in separate subsections below.

1.2.2.1. A single vowel, unstressed / i /, is treated in the immediately following paragraphs. Unstressed / i / has three allophones occurring in non-overlapping distribution.

/ i / is high front unrounded. It occurs medially (/ ...__.../) and finally (/ ...__#/) as voiceless [I] in some environments, as voiced with short voiceless off-glide [i^h] in some, and as fully voiced [i] in certain other environments.

Environments in which the three allophones of / i /

appear are specified in three paragraphs and six statements, (a) through (f), below.

Environments in which / i / appears as voiceless [I] are: (a) finally (/ ...__#/); (b) between a vowel and a following / C^{v1} / (/ ...V__C^{v1}... /); (c) between one of the consonants / k, g, w / and a following / C^{v1} / (/ C^{k,g,w}__C^{v1}... /)

The single environment in which / i / appears as voiced with voiceless off-glide [i^h] is: (d) between / C^{non-k,g,w} / (any consonant other than / k, g, w /) and a following / C^{v1} / (/ C^{non-k,g,w}__C^{v1}... /).

Environments in which / i / appears as fully voiced [i] are: (e) before / C^v / (/ ...__C^v... /); (f) before a vowel (/ ...__V /).

Examples of / i / are presented in three paragraphs (one for each allophone) below.

[I] :

/ gó·ki / [GóOkI] track, / wáikǎ / [wáIkǎ] three,
/ dá·gito· / [DáGItO] to loose, release, / gá·witanǎ /
[GáWItaNǎ] to whip, / kómákičudǎ / [kómIkIčú'tǎ] turtle.

[i^h] :

/ dómikǎ / [Dómi^hkǎ] Sunday, week, / ?á·mičudǎ /
[?á·mi^hčudǎ] to understand, be wise.

[i] :

/ sá·gigǎ / [sa·GiGI] valley, / ná·hagio / [ná^hhagiO]
mouse.

1.2.2.2. A single vowel, unstressed / ǎ /, is treated in

the following paragraphs. / ɨ / has three allophones occurring in non-overlapping distribution.

/ ɨ / is high central unrounded. It occurs medially (/ ...__.../) and finally (/ ...__ɨ/) as voiceless [ɨ̥] in some environments, as voiced with short voiceless off-glide [ɨ̥^h] in some, and as fully voiced [ɨ̥] in certain other environments.

Environments in which the three allophones of / ɨ / appear are specified in three paragraphs and five statements, (a) through (e), below.

Environments in which / ɨ / appears as voiceless ɨ̥ are: (a) finally (/ ...__ɨ/); (b) between any / C^{non-?} / (any consonant other than / ? /) and a following / C^{v1} / (/ C^{non-?}__C^{v1}... /).

The single environment in which / ɨ / appears as voiced with voiceless off-glide [ɨ̥^h] is: (c) between / ? / and a following / C^{v1} / (/ ?__C^{v1}... /).

Environments in which / ɨ / appears as fully voiced [ɨ̥] are: (d) before / C^v / (/ ...__C^v... /); (e) before a vowel (/ ...__V /).

Examples of / ɨ / are presented in three paragraphs (one for each allophone) below.

[ɨ̥] :

/ h'kɨ / [h'ɨ̥kɨ̥] armpit, / sig'wɨpɨki / [sig'wɨ̥pɨ̥kɨ̥]

strong, plural.

[ɨ̥^h] :

/ h'ɨ̥^hkɨ̥ / [h'ɨ̥^hɨ̥^hkɨ̥] sour.

[ɨ̥] :

/ bá'bidáki / [Bá'BáDkI] thunder, / čígadii /
[č'ígadiI] chewing gum.

1.2.2.3. Vowels phonemes treated in this subsection are unstressed / u /, / o /, and / a /. Each of these vowels has three allophones occurring in non-overlapping distribution.

The vowels / u /, / o /, and / a / are respectively high back rounded, low back rounded, and low central unrounded. They occur medially (/ ...__... /) and finally (/ ...__#/) as voiceless [U, O, A] in certain environments, as voiced with voiceless off-glide [u^h, o^h, a^h] in some environments, and as fully voiced [u, o, a] in certain other environments.

Environments in which the three allophones of each of the vowels / u /, / o /, and / a / occur are specified in three paragraphs and four statements, (a) through (d), below.

The single environment in which / u, o, a / appear as voiceless [U, O, A] is: (a) finally (/ ...__#/).

The single environment in which / u, o, a / appear as voiced with voiceless off-glide [u^h, o^h, a^h] is: (b) before / c^{v1} / (/ ...__c^{v1}... /).

Environments in which / u, o, a / appear as fully voiced [u, o, a] are: (c) before / c^v / (/ ...__c^v... /); (d) before a vowel (/ ...__v /).

Examples of / u, o, a / are presented in three groups of paragraphs (one for each allophone) below.

[U, O, A] :

/ wáhu / [wá^hhU] to sweat, non-present, / kúhu /
[kú^hhU] to make sounds (of animal).

/ móho / [mó^hhO] barril grass, to thresh, non-present, / mó[?]o / [mó[?]O] head.

/ stúha / [stú^hhA] white, / dá[?]a / [Dá[?]A] to fly, single actor.

[u^h, o^h, a^h] :

/ wí[?]utɛ / [wí[?]Du^htɛ] to swing;

/ [?]ókokoi / [[?]o^hko^hkoI] whitewing dove;

/ [?]á[?]aki / [[?]a[?]a^hkI] washes, arrollos.

[u, o, a] :

/ [?]ú[?]umɛ / [Jú[?]Du[?]ɛ] bear, / híalɛwui / [híalɛwuI]

poison;

/ móhonɛ / [mó^hhONɛ] to thresh, / hó[?]hoi / [hó[?]hoI]

mourning dove;

/ [?]čá[?]mámadi / [[?]či[?]mámaDI] horny toad, / hó[?]dai / [hó[?]DaI] stone, rock.

1.2.2.4. The present subsection treats short vowels in combination with stress / [?]V /: / [?]í, [?]ɛ, [?]ú, [?]ó, [?]á /. Each of these vowels has two allophones occurring in non-overlapping distribution.

The short stressed vowels occur medially (/...__.../) only, as voiced with short voiceless off-glide [í^h, ɛ^h, ú^h, ó^h, á^h] in certain environments and as fully voiced [í, ɛ, ú, ó, á] in certain other environments. Environments in which these allophones appear are specified in two paragraphs and three statements, (a) through (c), below.

The single environment in which the short stressed vowels appear as voiced with voiceless off-glide [í^h, ɛ^h,

[ú^h, ó^h, á^h] is: (a) before / C^{v1} / (/ ...__C^{v1}... /).

Environments in which they appear as fully voiced
[í, é, ú, ó, á] are: (b) before / C^v / (/ ...__C^v... /);
(c) before a vowel (/ ...__V /).

Examples are presented in two groups of paragraphs
(one for each allophone) below.

[í^h, é^h, ú^h, ó^h] :

/ gíkuʒí / [Gí^hkuʒI] whistle, / síkólí / [sí^hkoLɪ]

round;

/ wápiǵí / [wá^hpiǵiI] lightning, electricity,

/ gápi / [Gá^hpi] melon;

/ húkí / [hú^hkɪ] pine, lumber, / kúsíwo / [kú^hsíwoO]

neck;

/ wópo / [wó^hpoO] body hair, / ?óksí / [ʔó^hksɪ]

old woman;

/ wákialí / [wá^hkiaLɪ] cowboy, / ?átoʒa / [ʔá^hto^hʒaA]

diaper, breech clout.

[í, é, ú, ó, á] :

/ gígkí / [Gígkɪ] plows, / mímsa / [mím^hsaA] tables;

/ mádí / [máDɪ] to run; / bábáðáki / [BáBáDáki]

thunder;

/ múlipíǵí / [múlipiǵi] broken, something broken,

/ múmíla / [múmílaA] mules, / kúi / [kúI] mesquite;

/ gógoki / [GóGó^hkɪ] tracks, / símóikí / [sí^hmóIkɪ]

soft;

/ gágítí / [GáGítɪ] rifles, bows, / kái / [káI] seed(s).

1.2.2.5. The present subsection treats the long vowels

/ i·, ɨ·, u·, o·, a· / (V·). Each of the long vowels has two allophones occurring in non-overlapping distribution.

Long vowels are produced in the same positions as the corresponding short vowels. They occur medially (/ ...__... /) and finally (/ ...__#/) as voiced with a long voiceless off-glide [iI, ɨI, uU, oO, aA] in some environments and as fully voiced [i·, ɨ·, u·, o·, a·] in certain others. Long vowels may combine with stress; they are extra-long when stressed and medium long when unstressed.

Environments in which allophones of / V· / appear are specified in two paragraphs and three statements, (a) through (c), below.

Environments in which / V· / appear as voiced with voiceless off-glide [iI, ɨI, uU, oO, aA] are: (a) before / C^{V1} / (/ ...__C^{V1}.../); (b) finally (/ ...__#/).

The single environment in which / V· / appear as fully voiced [i·, ɨ·, u·, o·, a·] is: (c) before / C^V / (/ ...__C^V... /).

Examples of / V· / are presented in two groups of paragraphs (one for each allophone) below. In each case, stressed / V̇· / and unstressed / V̂· / are exemplified.

[iI, ɨI, uU, oO, aA] :

/ gí·ki / [GíIkI] plow, / gí· / [GíI] to get fat,
non-present, / číčɨwi·kudɨ / [čí^hčɨwiIku^tɨ] toy, / tóki· /
 [tó^hkiI] cotton.

/ má·kɨ / [máIkɨ] far, / má· / [máI] to run, sg. actor,
non-present, / wákɨ·kudɨ / [wá^hkɨIku^tɨ] milking machine,
 / mámhá· / [mámhɨI] to burn, continuative.

/ shú·kɨ / [shúUkɨ] warm, / mú· / [múU] to die, sg. actor, non-present, / múmu· / [múmuU] to wound, continuative.

/ wó·kɨ / [wóOkɨ] stomach, / nó· / [nóO] to bend, non-present, / wópo·himɨ / [wó^hpoOhimɨ] to run, pl. actor, cont., prog., / gíwiko· / [GíWikoO] to get tired, non-present.

/ má·kɨ / [máAkɨ] to give, / má· / [máA] to give, non-present, / móika·himɨ / [móIkaAhimɨ] to become soft, progressive, / wá·ga· / [wá·gaA] irrigation.

[i·, ɨ·, u·, o·, a·] :

/ gí·gi / [Gí·GI] grease, / tóki· bíhídami / [tó^hki· bí^hhídami] cotton picker.

/ tíwɨ·mɨ / [tíwɨ·MI] with us, / dádígiɨ·damɨ / [DáDígiɨ·daMI] wrestler.

/ šú·gɨ / [šú·Gɨ] mocking bird, / tikáwɨyu·ga· / [tIkáwɨyu·gaA] our horse.

/ mó·gɨ / [mó·Gɨ] straw, coffee grounds, / wópo·do· / [wó^hpo·doO] to keep running, imperative plural.

/ ká·mɨ / [ká·MI] cheek, / míliga·nɨ / [míliga·NI] white man.

1.3. In the present section, the distribution of Papago phonemes is treated. In subsection 1.3.1., consonants are grouped into distribution subclasses on the basis of their occurrence in consonant clusters. In subsection 1.3.2., the distribution of vowels is treated in terms of cluster possibilities and in terms of occurrence in sequence with consonants and contour defining pause.

1.3.1. All consonants can occur in the environment

/ ...V__V.../. Some consonants may occur in one or both of the environments / ...__C... / and / ...C__... /; they are assigned to distribution subclasses on the basis of their occurrence in specific environments of the types last mentioned.

Consonants are grouped into nine subclasses as follows (the first consonant in a set is used as a superscript to symbolize the subclass): $C^P = / p, t, \check{c}, k /$; $C^b = / b, d, \check{z}, g /$; $C^d = / \check{d} /$; $C^S = / s, \check{s} /$; $C^h = / h, \check{?} /$; $C^m = / m, n, \check{n} /$; $C^l = / l /$; $C^w = / w /$; $C^y = / y /$. The distribution of one member of a given subclass is, for the most part, the same as that of all other members of that subclass. Each distribution subclass is treated in a separate paragraph below.

Members of C^P occur contour initially and contour medially. They may occur (1) as second members of consonant clusters with members of C^S ($C^S + C^P$) and with homorganic members of C^m and C^b ($C^{m,b}_1 + C^P_1$), (2) as first members in clusters with members of C^S and C^h ($C^P + C^{S,h}$), and (3) as the first and second members of identical clusters ($C^P_1 + C^P_1$).

Members of C^b occur initially and medially. They may occur (1) as second members in clusters with homorganic members of C^m ($C^m_1 + C^b_1$), and (2) as first members in clusters with members of C^S and C^h ($C^b + C^{S,h}$) and with homorganic members of C^P ($C^b_1 + C^P_1$).

The single member of C^d occurs contour medially; it may occur (1) as the second member in clusters with / n / ($n + C^d$), and (2) as the first member in clusters with members

of C^S and C^h ($C^d + C^{S,h}$).

Members of C^S occur initially and medially. They may occur (1) as second members in clusters with any C except / $ʔ$, h , w , y / ($C^{\text{non-}ʔ,h,w,y} + C^S$), and (2) as first members in clusters with members of C^P and C^h ($C^S + C^{P,h}$).

Members of C^h occur initially and medially. They may occur (1) as second members in clusters with members of distribution subclasses C^P , C^b , C^m , C^l , and C^w ($C^{P,b,m,l,w} + C^h$), and (2) as the first and second members of identical clusters ($C^h_1 + C^h_1$).

Members of subclass C^m occur initially and medially. They may occur (1) as first members in clusters with C^S and C^h ($C^m + C^{S,h}$) and with homorganic members of C^P and C^b ($C^m + C^{P,b}$) (/ n / may appear as the first member in clusters with C^d), and (2) as the first and second members of identical clusters ($C^m_1 + C^m_1$).

The single member of C^w occurs initially and medially; it may occur (1) as the first member in clusters with members of C^h ($C^w + C^h$), and (2) as the first and second members of identical clusters ($C^w_1 + C^w_1$).

The single member of C^l occurs initially and medially; it may occur as the first member in clusters with members of C^S and C^h ($C^l + C^{S,h}$).

The single member of C^y occurs initially and medially; it does not occur in consonant clusters.

Consonant clusters are nonidentical-nonhomorganic, homorganic, or identical. Consonant clusters of each of these

types are exemplified below.

Nonidentical and nonhomorganic consonant clusters are (1) those with C^S as the first member ($/C^S + C^P/$, $/C^S + C^h/$), (2) those with C^S as second member ($/C^P + C^S/$, $/C^b + C^S/$, $C^m + C^S/$, $/C^l + C^S/$), and (3) those with C^h as the second member ($/C^P + C^h/$, $/C^b + C^h/$, $/C^S + C^h/$, $/C^m + C^h/$, $/C^l + C^h/$). Examples of nonidentical and nonhomorganic clusters are given below.

C^S as first member:

/ spáđima· / lazy, / stóni / hot, / sčí·dagi / blue,
green, / skáwáki / hard, / shá·sanigi / full of saguaros,
 / s'úami / yellow.

C^S as second member:

/ čú·čši / to extinguish, plural goal, / tá·tsi / to
split, / 'ú·ksi / calf of leg, / 'óksi / old woman, / kú·bsi /
smoke, dust, / hádsidi / to splash, / háđsi / to stick, glue,
non-present, / dágsi / to press, non-present, / žú'užsadiki /
loose, distributive, / mímsa· / tables, / mímsi / Protestants,
 / gínsi / dice game, / mansá·na· / apple, / kalsí·do· / socks,
 / wú·lsi / to tie up, non-present.

C^h as second member:

/ s'áp há'icu· / something good, / t'í·'íđi / our blood,
 / tháhaiwaniga· / our cattle, / bá·bhai / tails, / dá·dhaidagi /
handles, good riders, / sážúžhagi / resilient, plural,
 / gá·ghimi / to go and seek, / nówid 'áni / on his hand,
 / mímhi· / to burn, continuative, / nánhagio / mice, earrings,
 / nán'í· / to fly, plural actor, continuative, / málhogi /

ocotillo, / lál^ʔaspí / to trap, plural goal, / ʔ³íwho[•] /
gopher,

Homorganic consonant clusters are (1) those with C^m as first member (/C^m₁ + C^p₁/, /C^m₁ + C^b₁/) and (2) those with C^b as first member (/C^b₁ + C^p₁). Examples are given below.

C^m as first member:

/ wístimá·mpa[•] / ten places, / kúntí / to take a husband, / sónč[•]kí / to break with blows, / ló·mbo[•] / Jew's harp, top, / ná·nda[•] / to kindle, continuative, / mánž[•]ki / baking grease.

C^b as first member:

/ ʔab pó·tolít ʔábí / onto, against the bronc, / nú·kudtamí / caretaker, tender, / hímažč[•] / while walking along, / sú·dagka[•] / possessed, owned water.

Identical clusters are (1) those in which both members are C^p (C^p₁ + C^p₁/), (2) those in which both members are C^m (/C^m₁ + C^m/), (3) those in which both members are C^s (C^s₁ + C^s₁/), (4) those in which both members are C^h (C^h₁ + C^h₁/), and (5) those in which both members are C^w (C^w + C^w/). Examples of identical clusters are given below.

Both members are C^p:

/ ʔáuppa[•] / cottonwood, / wátto[•] / shade, ramada, / číčč[•]inadagi / posts for ramada, / hákko[•] / loop, hondo.

Both members are C^m:

/ wáhammadí / racer snakes, / nínna[•] / to wake up, continuative, / n[•]ná·nda[•] / to wait for me.

Both members are C^s:

/ gáссо· / fox, / wússadî / to take out, continuative.

Both members are C^h:

/ húhhagî / to haul, / ʏíʔʔóksî / aunt, mother's older sister.

Both members are C^w:

/ čáw wíʏina· / long rope.

Consonant clusters with more than two members are describable in terms of (dissolvable from) possible two-member clusters. In a three-member cluster (C₁C₂C₃), C₂ is a member of a subclass which may appear as the second member in a cluster with C₁ and as the first member in a cluster with C₃ (example: / lsp / describable in terms of the possible two-member clusters / ls / and / sp /). In a four-member cluster (C₁C₂C₃C₄), C₂ is a member of a subclass which may appear as the second member in a cluster with C₁ and as the first member in a cluster with C₃; similarly, C₃ belongs to a subclass which may appear as the second member in a cluster with C₂ and as the first member in a cluster with C₄ (example: / ndʂʔ /, from the possible two-member clusters / nd /, / dʂ /, and / ʂʔ /). All clusters of more than two members are describable in this manner. Random examples of clusters with more than two members are listed below.

Three members:

/ wú·lʂpî / to tie up, hitch, / dágʂpî / to press,
 / ʂóntsî / to chop to pieces, / gógs ʂóiga· / dog pet,
 / hátasppa· / five places.

Four members:

/ nd ʔ ía p ʔ o wa ʔ i dá·kad̥# / I should stay here,
 / wú·lsp ʔ o· g ↓ káw̥yu·# / He is hitching the horse up.
 / wántʂ ʔ and̥i g̥ ↓ tapial̥# / I tore the paper.

1.3.2. The present subsection is concerned with the distribution of vowel phonemes.

All vowels (V) may occur medially (/ ...__... /), finally (/ ...__# /), and between consonants (/ C__C... /). Short vowels and the long vowel / a· / occur in vowel clusters.

This subsection includes four statements regarding the distribution of vowels. Subsection 1.3.2.1. treats vowel clusters; 1.3.2.2. treats the distribution of / ɛ̥ /; 1.3.2.3. is a statement regarding short / u, o, a / in environment between / C / and a following / # /; 1.3.2.4. is a statement regarding the distribution of / ǎ /.

1.3.2.1. All vowel clusters are non-identical and include one or the other of the vowels / u / or / i /. There are no vowel clusters with more than two members.

One long vowel / a· /, but no other, may occur in certain vowel clusters; it occurs as the second member in clusters with / i / or / u /.

Vowels are treated below according to their occurrence as the first member in vowel clusters.

/ i / occurs as the first member in clusters with / u, o, a, a· /. Examples of vowel clusters with / i / as the first member are listed below.

/ hákiu / old, former, / gíusan̥ / to strike a match;
 / náhagio / mouse, earring, / kíot̥ / to rustle cattle;

/ nágia / to hang, / hía / to urinate, non-present;
 / hía·?i / to urinate, hortative.

/ ì / occurs as the first member in clusters with
 / i, u /. Examples are listed below.

/ mái / to burn, non-present, / ǎigadii / chewing gum;
 / háu?u / yes.

/ u / occurs as the first member in clusters with
 / i, a, a· /. Examples are listed below.

/ hialiwui / poison, / kúi / mesquite;
 / túa / acorn;
 / kúa· / forehead, cliff.

/ o / occurs as the first member in clusters with
 / i /. Examples are given below.

/ hó·hoi / mourning dove, / ?óidì / to follow.

/ a / occurs as the first member in clusters with
 / i, u /. Examples are listed below.

/ hó·dai / stone, / tái / fire;
 / háupalì / hawk.

1.3.2.2. The total distribution of / ì / sets it off, into a separate subclass, from all other vowels. This subsection is concerned with the occurrence of short, unstressed / ì / in environments of the type / C__C / (symbolized below as environments X and Y).

/ ì / may occur in environment X and never occurs in environment Y (in which, however, it is set up morphophonemically, see 2.1.2.2. below).

Environment X includes all sequences of the type

/ C₁—C₂ / in which C₁ and C₂ are consonants which never occur as the first and second members of a cluster with each other (see 1.3.1. for consonant distribution subclasses).

Environment Y includes all sequences of the type / C₁—C₂ / in which C₁ and C₂ are consonants which may occur respectively as the first and second members of a consonant cluster with each other (see 1.3.1. for consonant clusters).

1.3.2.3. Short, unstressed / u, o, a / occur in the environment / ...C__# / (finally, following a consonant) only where C = C^h (/ h, ʔ /). Examples of / u, o, a / in the environment / ...C^h__# / are listed below.

- / ... wáhu# / to sweat, non-present;
- / ... móʔo# / head,
- / ... dáʔa# / to jump, fly, single actor.

1.3.2.4. / V́ / (any short stressed vowel) never occurs immediately followed by / ↓, # / (contour included juncture or contour defining pause) or preceded by / V / (any vowel).

Environments in which / V́ / occurs are / C__C... / (flanked by consonants) and / C__V̇... / (between a consonant and a following unstressed vowel). Examples are listed below.

- / tátai / sinew, / gágítí / rifles, bows;
- / kái / seed, / símóikí / soft.¹

FOOTNOTE TO CHAPTER I

1. This analysis of Papago phonemes is the result of a great deal of consultation and discussion with Dr. C. F. Voegelin and other scholars associated with the Indiana University Field Station at Flagstaff, Arizona. Trips to the Field Station and constant correspondence with Dr. Voegelin were of great help during my field work with the Papago.

Upon my return to Indiana University to work up the data, I took the opportunity to discuss this analysis with Dr. George Herzog whose intimate knowledge of Pima, a closely related dialect, was of great help. I am also indebted to the staff of the Ethnolinguistic Seminar, under the joint direction of the Linguistics Committee and the Anthropology Department, before whom I had the privilege of presenting this analysis.

CHAPTER II

MORPHOPHONEMICS

2. The inventory, description, and distribution of phonemes are presented in 1. Inventories of affixes and minor stems and the distribution of these and of members of the major stem classes are given in 3, and 4 below. In the present chapter, we are concerned with the distribution of morpheme alternants. That is, we are concerned here with the phonemic constituency of given morphemes in specific phonological and/or morphological environments.

Any morphologically minimum segment which is isolated in utterances occurring in the corpus and assigned as a member to a single morpheme is here termed an ALTERNANT (an alternant may be a sequence of phonemes or zero). An alternant is said to OCCUR in such and such an environment. A given morpheme may have a single alternant (i.e., appear as a particular sequence of phonemes in all its environments) or multiple alternants (i.e., appear as different sequences of phonemes or as zero in different environments).

Certain alternations are automatic or phonologically determined in that the environments of two or more alternants are phonemically differentiable (i.e., all the environments of a given alternant share some phonemic feature). Some alternations are morphologically determined in that the environments of two or more alternants must be specified morphemically;

morphemically specified environments are either class-specified (that is, an alternation is associated with all members of a particular morphological class or all members of a particular class which, in some environment, share some phonemic feature), or list-specified (that is, an alternation is associated with all members of a list of morphemes where the list overlaps morphological class boundaries or includes some, but not all, of the members of a given class).

Phonologically determined alternations are either productive or unproductive. Those phonologically determined alternations which are generalizable as occurring in all morphemes which, in some environment, share some phonemic feature are termed productive. Phonologically determined alternation which is characteristic of one or only a few morphemes is termed unproductive. Operationally, productive alternations are supplied with morphophonemic notation; unproductive alternations are not so supplied.

This chapter is divided into two sections: section 2.1. treats phonologically determined alternations which are productive; section 2.2. treats morphologically determined alternations and phonologically determined alternations which are unproductive (the procedure in section 2.2. is to treat alternants of affixes in the order in which the affixes appear in inventories in Chapters III and IV). The morphophonemic analysis presented here is not considered exhaustive; only those alternations are treated which are useful in ensuing chapters.

2.1. Alternations treated in this section are those which are describable in terms of phonemic environment. Alternations are supplied with a system of notations and rules, termed MORPHOPHONEMES, by which it is possible to translate a uniquely constituted morpheme (string of morphophonemes) into its various phonemic shapes. Morphophonemic notation is enclosed in braces { }.

The first type of alternation treated below (2.1.1.) involves the substitution of vowels in sets. That is, morpheme alternants differ in one of their constituent vowel phonemes. As an example of this type of alternation, we cite the following. A morpheme glossed as (inal N sp) anus has, among others, the alternants ?átí ~ ?áta- occurring in phonemically differentiable sets of environments and differing from each other in constituent vowel phoneme (here, the final vowel).

Another type of alternation (see 2.1.2.) involves the presence or absence of certain vowel phonemes; that is, alternants differ in the presence or absence of a constituent vowel phoneme. As an example of this type of alternation, we cite the following. A morpheme glossed as (al N sp) stick, tree has alternants ?ú·sî(-) ~ ?ú·si- ~ ?ú·s- occurring in phonemically differentiable sets of environments and differing from each other in a final vowel or in the presence or absence of that vowel.

Subsection 2.1.3. treats alternation involving the substitution of consonants in sets. That is, morpheme alternants differ in one of their constituent consonant phonemes.

As an example of alternation involving the substitution of consonants in sets, we cite the following. A morpheme glossed as (tr V₁ b sp) to kindle has alternants ná·dA~ná·ǰ- occurring in phonemically differentiable sets of environments and differing from each other in a constituent consonant phoneme (as well as in the presence or absence of a final vowel).

Subsection 2.1.4. treats alternation involving the presence or absence of a particular consonant / h /. A morpheme glossed as (inal N sp) eye has alternants wúhi~wui occurring in phonemically differentiable sets of environments and differing from each other in the presence or absence of a medial / h /.

2.1.1. This subsection is concerned with alternation involving the substitution of morpheme final, short, unstressed vowels in sets. Specifically, the alternations treated here are: / ...Ca / ~ / ...C_h /; / ...Ci / ~ / ...C_i /; and / ...Cu / ~ / ...C_u / (the notation ... stands for phonemic material which may or may not be present but which is irrelevant to the discussion).

Members of a large list of morphemes exhibit an alternation exemplified by the morpheme glossed as (inal N sp) anus ʔát_h(-)~ʔáta-. The final vowels of morphemes showing this alternation are included in the morphophoneme † A †. Another large list of morphemes exhibits an alternation exemplified by the morpheme glossed as (inal N sp) mouth čín_h(-)~čín_i-. The final vowels of morphemes showing this alternation are included in the morphophoneme † I †. Finally, a single morpheme in the

data exhibits an alternation exemplified by the morpheme glossed as (adv₂A₁sp) black čúkĩ(-) ~ čúku-; the final vowels of this morpheme are subsumed under the morphophoneme † U †.

In the alternations listed above, morphemes appear with one or the other of two vowels. Each of these sets of two vowels has been supplied with a morphophonemic symbol. In the paragraphs which follow, the environments are specified and exemplified in which each of the vowels in the three sets † A †, † I †, and † U † occur.

The morphophoneme † A † represents a morpheme final vowel which appears as / a / in certain environments and as † ĩ † (see 2.1.2.2. for the values of † ĩ †) in certain others.

Environments in which † A † appears as † ĩ † are: (1) word finally; (2) before a suffix beginning in / C^{v1} / (p, t, č, k, s, š, h); (3) before a morpheme or morpheme sequence beginning in / C^v / (b, d, ž, g, m, n, ŋ, l, w, y) plus / V[•] / or / a /. The morphophoneme † A † appears as / a / before a suffix or suffix sequence beginning in / C^v / plus / V^{non-a} / (any short vowel other than / a /).

Examples of † A † are given below:

† níokA † / níokĩ / to speak; † níokA + -dA † / níokadi / to speak, durative; † níokA + -dani † / níokidani / to speak, dur., imperative singular.

† číkípanA † / číkípanĩ / to work; † číkípanA + -dA † / číkípanadi / to work, dur.; † číkípanA + -ni † / číkípanani / to work, imperative sg.; † číkípanA + -dani- † / číkípanidani / to work, dur., imperative sg.

† kó·sA † / kó·ṣi / to sleep; † kó·sA + -dA † / kó·sadi / to sleep, dur.; † kó·sA + -daṇi † / kó·ṣidani / to sleep, dur., imperative sg.

† ?ónA † / ?óṇi / salt; † ?ónA + -g̣i † / ?ónagi / full of salt; † ?ónA + -ga· † / ?óṇiga· / possessed salt; † ?ónA + -kaẓ̌i † / ?óṇikaẓ̌i / with, by means of salt.

† ḅána † / ḅani / coyote; † si- + reduplicative + ḅána + -g̣i † / ṣiḅá·banagi / full of coyotes; † si- + ḅána + -ma· † / ṣiḅáni·ma· / coyote like; † ḅána + -ga· † / ḅani·ga· / possessed coyote.

† híkA † / híḳi / navel; † híkA + -ẓ̌i † / híkaẓ̌i / his navel.

† č̣í·mA † / č̣í·ṃi / heel; † č̣í·mA + -ẓ̌i † / č̣í·maẓ̌i / his heel.

The morphophoneme † I † represents a morpheme final vowel which appears as / i / in certain environments and as † ị † in certain others.

Environments in which † I † appears as † ị † are: (1) word finally following one of the consonants / č̣, ẓ̌, n, s, l /; (2) before a suffix beginning in / C^{v1} /; (3) before a suffix or suffix sequence beginning in / C^v / plus / V· /. Environments in which † I † appears as / i / are: (1) word finally following one of the consonants / p, b, m /; and (2) before a suffix or suffix sequence beginning in / C^v / plus / V /.

Examples of † I † are listed below:

† hú·č̣I † / hú·č̣ị / finger nail, claw; † hú·č̣I + -kaẓ̌i † / hú·č̣ikaẓ̌i / by means of the claw; † hú·č̣I + -ẓ̌i † / hú·č̣iẓ̌i /

his fingernail, its claw.

† hú·nǎ † / hú·nǎ / corn; † hú·nǎ + -ga· † / hú·nǎga· / possessed corn; † sǎ- + hú·nǎ + -gǎ † / sǎhú·nǎgǎ / full of corn.

† čínǎ † / čínǎ / mouth; † čínǎ + -ǒǎ † / čínǎǒǎ / his mouth.

† ?ú·sǎ † / ?ú·sǎ / stick, tree; † ?ú·sǎ + -kaǒǎ † / ?ú·sǎkaǒǎ / by means of a stick; † ?ú·sǎ + -ga· † / ?ú·sǎga· / possessed stick, tree; † sǎ- + reduplicative + ?ú·sǎ + -gǎ † / sǎ?ú·sǎgǎ / full of trees.

† čú·lǎ † / čú·lǎ / hip; † čú·lǎ + -ǒǎ † / čú·lǎǒǎ / his hip.

† tó·bǎ † / tó·bǎ / cottontail; † tó·bǎ + -kaǒǎ † / tó·bǎkaǒǎ / like a cottontail; † tó·bǎ + -ga· † / tó·bǎga· / possessed cottontail; † sǎ- + reduplicative + tó·bǎ + -gǎ † / sǎtótobǎgǎ / full of cottontails.

† kómǎ † / kómǎ / small of the back, shell; † kómǎ + -kaǒǎ † / kómǎkaǒǎ / by means of a shell; † kómǎ + -ǒǎ † / kómǎǒǎ / his small of the back, its shell.

† ǒǎ·nǎ † / ǒǎ·nǎ / to smoke; † ǒǎ·nǎ + -himǎ † / ǒǎ·nǎhimǎ / to smoke, progressive; † ǒǎ·nǎ + -kuǎ † / ǒǎ·nǎkuǎ / smoking instrument; † ǒǎ·nǎ + -dǎ † / ǒǎ·nǎdǎ / to smoke, dur.; † ǒǎ·nǎ + -nǎ † / #ǎ·nǎnǎ / to smoke, imperative, sg.

The morphophonemes † A † and † I † have partially non-overlapping distribution. Consonants which may immediately precede † A † are / p, b, g, t, d, k, m, n, s, w /; consonants

which may precede † I † are / p, b, č, ž, s, m, n, l /. The environments in which the distributions of † A † and † I † show overlap are / ...p__ /, / ...b__ /, and / ...m__ /.

The morphophoneme † U †, appearing in the single morpheme † čúkU † black, appears as † ě † word finally and before / C^{v1} /; it appears as / u / before / C^v /.

Examples of † U † are given below:

† čúkU † / čúkě / black; † čúkU + -ču²u † / čúkěču²u / something black, the black one; † čúkU + -ma[•] † / čúkuma[•] / black, adverbial; † čúkU + -dA † / čúkuďě / to blacken.

2.1.2. The following subsections treat alternation involving the presence or absence of certain vowel phonemes. Specifically, 2.1.2.1. treats alternation involving the presence or absence of morpheme final, unstressed, short vowels; 2.1.2.2. treats alternation involving the presence or absence of / ě /.

2.1.2.1. All morphemes which otherwise appear as / ...CV /, appear as / ...C / (i.e., without the final vowel) before any morpheme beginning in a vowel. Morphemes showing this alternation are specified morphophonemically as † ...CV †. The formula † ...CV † includes phoneme sequences / ...CV / and / ...C / with a rule stating that † ...CV † appears as / ...C / before / V... / and as / ...CV / elsewhere.

Examples of † ...CV † are listed below:

† hí¹a + -i † / hí¹i / urine.

† máhi + -i † / máhi / fire.

† wú[•]đA + -a[•] † / wú[•]đa[•] / act of roping, tying.

- † wá·gA † / wá·ga· / irrigation.
 † ?í?i + -okí † / ?í?okí / having drunk.
 † nǎidA + -okí † / nǎidokí / having seen.
 † wí·nI + -o· † / wí·no· / to suck, imperative plural.
 † číkípanA + -o· † / číkípano· / to work, imperative pl.

2.1.2.2. The present subsection is concerned with alternation involving the presence or absence of / $\dot{\text{z}}$ / (see 1.3.2.2. for a discussion of the distribution of / $\dot{\text{z}}$ /).

In Papago, all morphemes which show alternants ending in / ...C $\dot{\text{z}}$ / when they occur in sequence before a morpheme beginning in a consonant of a certain type, show otherwise identical alternants but without the final / $\dot{\text{z}}$ / when they occur before a morpheme beginning in a consonant of another type. For example, a morpheme ll s $\dot{\text{z}}$ -~s- intensive appears as / s $\dot{\text{z}}$ - / before the morpheme g $\acute{\text{w}}$ íkí strong and some others, and as / s- / before káwíkí hard and some others. The distribution of these alternants, and analogous ones, is describable entirely in terms of the phonemic environment (specifically, the initial consonant of a following morpheme).

The specific environments of alternants with and without final / $\dot{\text{z}}$ / may be stated as follows:

Morphemes which show alternants of the shape / ...C $\dot{\text{z}}$ / (where C $\dot{\text{z}}$ is a given consonant) when they occur in sequence before morphemes of the shape / C $\dot{\text{y}}$... / (where C $\dot{\text{y}}$ is a consonant of a class which may not appear as the second member in a cluster with C $\dot{\text{z}}$, see 1.3.1.1. for distribution of consonants), show alternants of the shape / ...C $\dot{\text{z}}$ / when they occur in

sequence before morphemes of the shape / C^Z... / (where C^Z is a consonant of a class which may appear as the second member of a cluster with C^X, see 1.3.1.1. and 1.3.1.1.1.).

In our example above, the morpheme ll s[±]-ns- intensive appears as / s[±]- / (C^X plus / [±] /) in sequence before g[±]w[±]k[±] strong (C^Y...; / g / is a consonant which never appears as the second member of a cluster with / s /, and as / s- / (C^X alone) before k[±]w[±]k[±] hard (C^Z...; / k / is a consonant which may appear as the second member in a cluster with / s /).

The phonemic distribution of / [±] / shows that it may appear flanked by consonants which never appear as the first and second members of a cluster with each other (environment C^X__C^Y above), and that it does not appear flanked by consonants which may occur as the first and second members of a cluster with each other (environment C^X__C^Z above).

In order to have, in our morphophonemic notation, identical constitution for all members of morphemes showing the alternation treated above, we rewrite all phonemic consonant clusters with an intervening { [±] }, thus extending the use of a phoneme symbol to environments in which it is not written in phonemic transcription (environment C^X±C^Z).

The morphophonemic notation { C[±]C } , then, includes the formulae { C^X±C^Y } , representing phoneme sequences of the type / C[±]C /, and { C^X±C^Z } , representing phoneme sequences of the type / CC /. Now, the alternants of the morpheme ll intensive have identical constitution { s[±]- } in the

morphophonemic notation; similarly for all morphemes showing an alternation analogous to that of $\{ s_{\pm} - \}$. A rule states that any juxtaposition of morphemes resulting in sequences specified morphophonemically as $\{ \dots C^X_{\pm} C^Z \dots \}$, appears as phonemic / $\dots C^X C^Z \dots$ /; similarly, $\{ \dots C^X_{\pm} C^Y \dots \}$ appears as phonemic / $\dots C^X C^Y \dots$ /.

Additional examples of $\{ \pm \}$ are listed below:

$\{ t_{\pm} - \}$ 43 1 pl. goal, possessor: $\{ t_{\pm} - + má \cdot gina \cdot \}$ / $t_{\pm} má \cdot gina \cdot$ / our car; $\{ t_{\pm} - + ?_{\pm} \cdot ?_{\pm} d_{\pm} \}$ / $t_{\pm} ?_{\pm} \cdot ?_{\pm} d_{\pm}$ / our blood.

$\{ ?_{\pm} m_{\pm} - \}$ 44 2 pl. goal, possessor: $\{ ?_{\pm} m_{\pm} - + k_{\pm} \cdot \}$ / $?_{\pm} m_{\pm} k_{\pm} \cdot$ / your house; $\{ ?_{\pm} m_{\pm} - + má \cdot gina \cdot \}$ / $?_{\pm} m_{\pm} má \cdot gina \cdot$ / your (pl.) car.

$\{ h_{\pm} \cdot n_{\pm} \}$ corn: $\{ h_{\pm} \cdot n_{\pm} + -ga \cdot \}$ / $h_{\pm} \cdot n_{\pm} ga \cdot$ / possessed corn; $\{ h_{\pm} \cdot n_{\pm} + -č_{\pm} \dots \}$ / $h_{\pm} \cdot n_{\pm} č_{\pm} ?_{\pm} d_{\pm}$ / in among the corn plants.

$\{ ?_{\pm} ú \cdot s_{\pm} \}$ stick, tree: $\{ ?_{\pm} ú \cdot s_{\pm} + -ga \cdot \}$ / $?_{\pm} ú \cdot s_{\pm} ga \cdot$ / possessed tree, stick; $\{ ?_{\pm} ú \cdot s_{\pm} + -kaž_{\pm} \}$ / $?_{\pm} ú \cdot skaž_{\pm}$ / by means of a stick.

The notation adopted in regard to alternation involving presence or absence of / \pm / is maintained throughout the remainder of this study. Citations in diagonals are morphophonemic in this respect.

2.1.3. Alternations involving the substitution of consonants in sets are treated in the present subsection. Subsection 2.1.3.1. treats alternation involving substitution between members of the two consonant sets C' (t, d, \dot{d} , s, n) and C''

(s, ʒ, l, s, n). Subsection 2.1.3.2. treats alternation involving substitution between members of sets C^2 (t, d, n) and C^3 (č, ʒ, n).

2.1.3.1. Alternations involving substitution between members of the consonant set C' (t, d, ḍ, ʒ, n) and their serially corresponding members of set C'' (s, ʒ, l, s, n) are treated in this subsection: i.e., $C' t \sim C'' s$; $C' d \sim C'' ʒ$; $C' ḍ \sim C'' l$; $C' ʒ \sim C'' s$; $C' n \sim C'' n$.

The environments of alternants in each of the sets $C' \sim C''$ are specified below.

Morphemes which, when they are not followed by suffixes of the shape $\{ -i... \}$ or $\{ -I... \}$, show alternants of the shape $\{ ...C'A \}$, show alternants of the shape $/ ...C'' /$ when they occur before suffixes beginning in $\{ -i... \}$ or $\{ -I... \}$. In the morphophonemic notation, morphemes showing this alternation are specified as $\{ ...C'A \}$ with the rule that sequences specified morphophonemically as $\{ ...C'A + -i..., -I... \}$ appear as phonemic $/ ...C''i... /$ or $/ ...C''I... /$ (see 2.1.1. for values of $\{ I \}$).

Examples of $\{ ...C'A \}$ are listed below:

$\{ ná \cdot dA \}$ / $ná \cdot dI$ / to kindle; $\{ ná \cdot dA + -I \}$ / $ná \cdot ʒI$ / fire, result of kindling.

$\{ híotA \}$ / $híotI$ / to bloom; $\{ híotA + -igA \}$ / $híosigI$ / flower.

$\{ wíhotA \}$ / $wíhotI$ / to vomit; $\{ wíhotA + -I \}$ / $wíhosI$ / vomit.

$\{ ?ó?otA \}$ / $?ó?otI$ / to leak, drip; $\{ ?ó?otA + -idA \}$

/ ʔóʔosid̩ / to percolate, strain.

‡ háwɪd̩A † / háwɪd̩ / to blow, as wind; ‡ háwɪd̩A +
-I † / háwɪl̩ / wind.

‡ wú·d̩A † / wú·d̩ / to rope, tie; ‡ wú·d̩A + id̩A †
/ wú·lid̩ / to rope, tie for someone.

‡ kó·s̩A † / kó·s̩ / to sleep; ‡ kó·s̩A + -id̩A †
/ kó·sid̩ / to put to sleep.

‡ ʔís̩A † / ʔís̩ / to plant; ‡ reduplicative + ʔís̩A +
-I † / ʔís̩ʔís̩ / crops.

‡ číkɪpanA † / číkɪpan̩ / to work; ‡ číkɪpanA + -id̩A †
/ číkɪpanid̩ / to work for someone.

‡ wákɔnA † / wákɔn̩ / to wash; ‡ wákɔnA + -id̩A †
/ wákɔnid̩ / to wash for someone; ‡ wákɔnA + -I † / wákɔn̩ /
a baptized person.

2.1.3.2. Alternation involving substitution between members of the consonant set C^2 (t, d, n) and C^3 (č, ʒ, n) is treated here. This alternation is characterized by regressive assimilation operating in environments of the type ‡ ...CVC... † not interrupted by an occurrence of / ↓ /.

Morphemes which otherwise appear as / ... C^2 V / (where C^2 is in a given manner subclass), appear as / ... C^3 / (where C^3 is in the same manner subclass as original C^2) before suffixes beginning in / č /. Morphemes showing this alternation are specified morphophonemically as ‡ ... C^2 V † in all environments. Morphemes which otherwise appear as / ... C^3 V /, appear as / ... C^2 V / before suffixes beginning in

/ t /; these are specified as $\{ \dots C^3 V \}$. A rule states that sequences specified morphophonemically as $\{ \dots C^3 V + -t \dots \}$ appear as / $\dots C^2 \dot{t} \dots$ /, and sequences specified as $\{ \dots C^2 V + -\check{c} \dots \}$ appear as / $\dots C^3 \dot{\check{c}} \dots$ /.

Examples are listed below:

$\{ \text{?a-} + \check{c}I + -t\dot{\check{c}} \}$ / $\text{?at}\dot{\check{c}}\dot{\check{c}} /$ 1 pl., nonsp. mode, non-present.

$\{ \text{náwo}\check{z}I + -tA \}$ / $\text{náwo}\dot{\check{c}}\dot{\check{c}} /$ to make a friend.

$\{ \check{z}\acute{u}nI + -tA \}$ / $\check{z}\acute{u}n\dot{\check{c}}\dot{\check{c}} /$ to make cactus candy.

$\{ \text{?á?ana} + -\check{c}udA \}$ / $\text{?á?an}\dot{\check{c}}\dot{\check{c}} /$ to fletch.

$\{ \text{má}\dot{\check{c}}A + -dA + -\check{c}\dot{\check{c}} \}$ / $\text{má}\dot{\check{c}}\dot{\check{c}}\dot{\check{c}} /$ while running along.

2.1.4. The present subsection treats alternation involving the presence or absence of a specific consonant, / h /, in phonemically differentiable environments.

All morphemes which otherwise appear as / $\dots \acute{V}_1 h V_2$ / (where V_1 and V_2 are non-identical), appear as / $\dots \acute{V}_1 V_2$ / before morphemes beginning in / C^{V1} /. Morphemes which otherwise appear as / $\dots \acute{V}_1 h \acute{V}_1$ /, appear as / $\dots \acute{V} \cdot$ / before morphemes beginning in / C^{V1} /. In the morphophonemic notation, morphemes showing this alternation are specified as $\{ \dots \acute{V} h V \}$ with a rule stating that the medial / h / is phonemically absent before / C^{V1} /.

Examples of $\{ \dots \acute{V} h V \}$ are listed below:

$\{ \text{wúhi} \}$ / $\text{wúhi} /$ eye; $\{ \text{wúhi} + -ka\check{z}\dot{\check{c}} \}$ / $\text{wúika}\check{z}\dot{\check{c}} /$ by means of the eye.

$\{ \text{máhi} \}$ / $\text{máhi} /$ to burn; $\{ \text{máhi} + -himi \}$ / $\text{máihimi} /$ to burn, progressive.

+ móho † / móho / barril grass; + móho + -kaǰi †
/ mó·kaǰi / by means of barril grass.

2.2. The present section treats alternation involving affixes (listed in 3. and 4.) and minor stems (listed in 4.). Alternations treated here include some phonologically determined alternations which are unproductive, certain alternations describable in terms of class-specified morphological environments, and alternation describable in terms of list-specified morphological environments.

In the presentation of list-specified environments, lists are given only if they are small (i.e., include two or three members) and are relegated to a dictionary (not included in the scope of this grammar) if they are large.¹

The procedure in this section is to proceed through the inventories and to treat, in the order of its appearance in those inventories, each affix or minor stem showing multiple alternants. Affixes and sets of affixes are treated in separate subsections below. Minor stems are treated last in a single subsection.

Certain environments are specified by means of morpheme sequence formulae in which affixes are represented by decade numbers and in which stems are represented by italicized caps (plus-minus lower case or subscript specification for subclass). In morpheme sequence formulae, obligatory items are preceded by a plus (+), nonobligatory items by plus-minus (±). Items which are mutually exclusive are separated by a comma (,). Phonemic or morphemic material which is irrelevant to

the particular environment being specified in a given instance, is omitted; its omission is represented by three dots (...).

2.2.1. The present subsection is concerned with alternants of the various reduplicative morphemes included in decade 50. Members of decade 50 are characterized, in most alternants, by repetition of a stem initial consonant-vowel sequence. Since the initial consonant-vowel sequence of one stem may be different from that of another, one occurrence of 50 may show complete lack of similarity to another. This suppletive aspect of reduplication is inherent in its definition and is not included here as a morphophonemic problem. In this subsection we treat alternants in terms of their different CV patterns (interphonemic specifications of the types $C\acute{V}CV\dots$, $C\acute{V}\cdot CV\dots$, etc.) in combination with stems which may combine with one or more of the reduplicatives 50. Hence, all occurrences of a given reduplicative which show the same interphonemic specification are grouped into a single alternant.

The reduplicative morphemes in Papago are the following: 51 plural, 52 distributive, 53 continuative, and 54 momentaneous (see 3.). Each reduplicative is treated separately below.

Alternants of 51 plural are listed and exemplified in the immediately following paragraphs. Environments of alternants are list-specified.

51.1: $C\acute{V}CV\dots$ ($C\acute{V}_1CV_1\dots$ in combination with stems of the shapes $C^6\acute{V}\dots$ (where $C^b = /ʔ, h /$), $C\acute{x}\dots$, $C\acute{x}\cdot\dots$, $C\acute{V}\dots$,

$C\acute{V}i\dots$, and in combination with certain, list-specified, stems of the shapes $C\acute{V}^{non-\acute{z}}\dots$ and $C\acute{V}\cdot non-\acute{z}\cdot\dots$; $\sim C\acute{V}^{non-\acute{z}}C\acute{z}\dots$ in combination with certain, list-specified, stems of the shapes $C\acute{V}^{non-\acute{z}}\dots$ or $C\acute{V}\cdot non-\acute{z}\cdot\dots$; $\sim C\acute{V}_1C\acute{V}_2\dots$ in combination with stems of the shapes $C\acute{u}a\dots$ or $C\acute{a}u\dots$):

$\acute{z}'uwi$ woman, $\acute{z}'u'wi$ women;
 $\acute{z}'u\cdot s\acute{z}$ stick, tree, $\acute{z}'u'us\acute{z}$ sticks, trees;
 $h\acute{a}'a\cdot$ bottle, pot, $h\acute{a}h\acute{a}'a\cdot$ bottles, pots;
 $h\acute{u}'u\cdot$ star, $h\acute{u}h\acute{u}'u\cdot$ stars;
 $\acute{c}\acute{z}\cdot g\acute{z}g\acute{z}$ name; $\acute{c}\acute{z}'\acute{c}\acute{z}g\acute{z}g\acute{z}$ names;
 $m\acute{a}ihog\acute{z}$ centipede, $m\acute{a}m\acute{a}ihog\acute{z}$ centipedes;
 $k\acute{u}i$ mesquite tree, $k\acute{u}k\acute{u}i$ mesquite trees;
 $k\acute{u}bi\acute{a}\acute{z}$ shovel, $k\acute{u}k\acute{u}bi\acute{a}\acute{z}$ shovels;
 $g\acute{o}'ki$ track, $g\acute{o}g\acute{o}ki$ tracks;
 $k\acute{a}\cdot w\acute{z}$ badger, $k\acute{a}k\acute{a}w\acute{z}$ badgers;
 $m\acute{a}\acute{c}\acute{z}'pod\acute{z}$ finger, $m\acute{a}m\acute{a}\acute{c}\acute{z}'pod\acute{z}$ fingers;
 $w\acute{a}k\acute{a}l\acute{a}\acute{z}$ cowboy, $w\acute{a}p\acute{a}k\acute{a}l\acute{a}\acute{z}$ cowboys;
 $k\acute{o}'ba\cdot$ drinking glass, $k\acute{o}k\acute{a}b\acute{a}\cdot$ drinking glasses;
 $g\acute{a}'t\acute{z}$ rifle, bow, $g\acute{a}g\acute{a}'t\acute{z}$ rifles, bows;
 $\acute{z}'u\acute{a}m\acute{z}$ yellow, $\acute{z}'u' \acute{z}'u\acute{a}m\acute{z}$ yellow, pl.;
 $h\acute{u}aw\acute{z}$ deer, $h\acute{u}h\acute{a}w\acute{z}$ deer, pl.;
 $h\acute{a}up\acute{a}l\acute{a}\acute{z}$ hawk, $h\acute{a}h\acute{a}up\acute{a}l\acute{a}\acute{z}$ hawks.

51.2: $C\acute{V}\cdot C\acute{V}\dots$ ($C\acute{V}\cdot C\acute{V}_1\dots$ in combination with stems of the shapes $C\acute{z}i\dots$, $C\acute{V}i\dots$, certain stems of the shapes $C\acute{V}C^v\dots$ and $C\acute{V}\cdot C^v\dots$; $\sim C\acute{V}\cdot C\acute{z}\dots$ in combination with stems of the shapes $C\acute{V}C^{v1}\dots$ and $C\acute{V}\cdot C^{v1}\dots$ and certain stems of the

shapes $CVC^V\dots$, $CV^C^V\dots$):

líati saddle rope, lí·liati saddle ropes;

láí king, lá·lai kings;

báni coyote, bá·bani coyotes;

táđi foot, tá·tadı feet.

wági hole, wá·pagi holes;

ná·ǰi fire, ná·naǰi fires;

ká·mi cheek, ká·kami cheeks;

nágia to hang, ná·nigia to hang pl. objects;

wú·đi to rope, tie, wú·pıđi to rope, tie pl. objects;

ná·ki ear; ná·niki ears;

dá·ki nose, abrupt ending of a mountain; dá·điki

noses, abrupt endings of mountain;

čúkuđi owl, čú·čikudı owls.

51.3: $CV_1CV_1(\dots)CV_2CV_2\dots$ (combined with certain stems of the shape $CV_1(\dots)CV^2_2\dots$):

kadó·di· marble, kakadóđodi· marbles;

wiyó·di· acorn, wipiyóyodi· acorns;

payá·so· clown, papayáyaso· clowns;

piló·di· ball, pipilólodi· balls;

piligí·do· parrot, pipiligígido· parrots;

?oligí·ya· pitch fork ?o?oligígiya· pitch forks;

?isikó·bıli· chisel, ?i?isikókobıli· chisels;

51.4: $CV_1wıpV_2\dots$ (combined with certain stems of the shape $CV_1wV_2\dots$):

wáwukı raccoon, wáwıpukı raccoons;

káwıki hard, káwıpıki hard pl.;

kówíkí thick, kówípíkí thick, pl.;
 gáwíkí strong, gáwípíkí strong, pl.;

Alternants of 52 distributive are listed and exemplified below. Lists are included for the few list-specified environments in which the lists are small.

52.1: CV[?]VCí... (combined with stems of the shape CV...):

sáwadíkí thick - as rope, sá[?]asíwadíkí thick, dist.;
 gákodíkí crooked, gá[?]agíkodíkí crooked, dist.;
 wádádíkí shiny, wá[?]apídadíkí shiny, dist.;
 ʒúsadíkí loose, ʒú[?]uʒísadíkí loose, dist.;
 gíwulíkí tapered, gí[?]igíwulíkí tapered, dist.;
 sípolíkí mounded, piled, sí[?]isípolíkí piled, dist..

52.2: CV[?]VCV[?]V... (combined with stems of the shapes CV... and CV[?]V...):

tó[?]oníkí mounded, bordered - as land for irrigating,
 tó[?]oto[?]oníkí mounded, bordered, dist.;
 lá[?]asípí to trap, lá[?]ala[?]asípí to trap, dist.;
 čú[?]dípí six, čú[?]učú[?]udípí by sixes;
 gí[?]íkí four, gí[?]igí[?]íkí by fours.

52.3: CV[?]CV... (combined with either of the stems húmugítí nine or hámakí one):

húmugítí nine, húhumugítí by nines;
 hámako[?] one, once, háhámako[?] by ones.

52.4: CV[?]wípV... (combined with the single stem wáwíkí seven):

wáwíkí seven, wáwípíkí by sevens.

Alternants of 53 continuative are listed and exemplified

in the immediately following paragraphs. Environments of the alternants are list-specified.

53.1: $C\acute{V}C(V)\dots V^\circ$ ($C\acute{V}_1CV_1\dots V^\circ$ in combination with stems of the shape $C^6\acute{V}\dots$; $\sim C\acute{V}C\ddot{\dots}V^\circ$ in combination with stems of the shapes $C^{\text{non-6}}\acute{V}\dots$ or $C^{\text{non-6}}\acute{V}^\circ\dots$; $\sim C\acute{V}C\dots V^\circ$ in combination with stems of the shapes $C^{\text{non-m}}\acute{V}^\circ\dots$, $C^{V1}\acute{V}h\dots$, $C\acute{V}^\circ$, or $C\acute{V}_1V_2$):

$há\acute{g}i$ to melt, $há\acute{h}ag\ddot{\dots}$ to melt, cont.;

$ʔá\acute{h}i$ to complete a cycle, $ʔá\acute{ʔ}ah\ddot{\dots}$ to complete a cycle, cont.;

$mú\acute{k}i$ to die, sg. actor, $mú\acute{m}áku^\circ$ to be sick, sg. actor;

$má\acute{d}\ddot{\dots}$ to run, sg. actor, $má\acute{m}á\acute{d}a^\circ$ to run, sg. actor, cont.;

$śá\acute{d}\ddot{\dots}$ to herd, $śá\acute{s}á\acute{d}a^\circ$ to herd, cont.;

$bá\acute{h}i$ to take a sg. object, $bá\acute{b}á\acute{h}\ddot{\dots}$ to take a sg. object, cont.;

$bá\acute{ʔ}a$ to swallow, $bá\acute{b}\ddot{\dots}$ to swallow, cont.;

$kó\acute{ʔ}i$ to die, pl. actor, $kó\acute{k}o^\circ$ to be sick, pl. actor;

$bí\acute{ʔ}a$ to dish out food, $bí\acute{b}ia$ to dish out food, cont.;

$mú^\circ$ to wound, shoot with a bow, $mú\acute{m}u^\circ$ to wound, cont.;

$wá$ to ruin, trample, $wí\acute{p}ia$ to ruin, cont.

53.2: $C\acute{V}\cdot C(V)\dots V^\circ$ ($C\acute{V}\cdot C\dots V^\circ$ in combination with either of the stems $ʔí\acute{ʔ}i$ to drink or $wú\acute{a}^\circ$ to throw a sg. object, to do; $\sim C\acute{V}\cdot C\ddot{\dots}V^\circ$ in combination with the stem $ná\acute{d}\ddot{\dots}$ to kindle, ignite):

$ʔí\acute{ʔ}i$ to drink, $ʔí\acute{ʔ}\ddot{\dots}$ to drink, cont.;

wú· to throw a sg. object, wú·pa· to throw a sg. object, cont.;

ná·dî to kindle, ná·nída· to kindle, cont..

53 continuative is, in most alternants, discontinuous. It is characterized by stem initial reduplication plus a final long vowel (of some quality or other) replacing the original stem final vowel. The replacive long vowel may be any of the following: -i·, -î·, -u·, -o·, -a· or the vowel cluster -ia. The environments of these alternants are list-specified. That is, members of verb subclass \underline{V}_1 (of which subclass association with 53 is diagnostic) are grouped into five lists; the members of one list take -i·; members of another list take -î·, and so on.

The single alternant of 54 momentaneous is exemplified below.

54: CV·CV... (CV·₁CV₁... in combination with stems of the shapes CV·C^v... and CV·C^v...; ~CV·Cî... in combination with stems of the shape CV·C^{v1}...):

dó·mî to copulate, dó·domî to copulate, mom.;

kú·mî to gnaw, kú·kumî to gnaw, mom.;

bí·tî to excrete, bí·bitî to excrete, mom.;

gá·wî to strike, gá·gáwî to strike, mom..

Stems which combine with 54 momentaneous are members of verb subclass \underline{V}_2 ; those members of \underline{V}_2 which otherwise end in † ...nI †, appear as † ...nA † when they occur in combination with 54.

Examples:

ʒí·nî to smoke, ʒí·ninî to smoke, imperative sg.,
 ʒí·ʒinî to smoke, mom., ʒí·ʒinani to smoke, mom., impera-
tive sg.

wí·nî to suck, wí·ninî to suck, imperative sg.,
 wí·pinî to suck, mom., wí·pinani to suck, mom., imperative sg.

wó·nî to pluck, wó·ninî to pluck, imperative sg.,
 wó·ponî to pluck, mom., wó·pinani to pluck, mom., impera-
tive sg.

Alternants of each of the reduplicative morphemes included in decade 50 are given above. In the following paragraphs, we treat the behavior of certain stem included phonemes of stems in combination with 50.

Most stems which begin in / w / show / p / as the repeated consonant when they combine with any one of the reduplicatives 50.

Examples:

wó·gî road, wópogî roads;
 wádadîkî shiny, wáʔapîdadîkî shiny, dist.;
 wú·dî to rope, wúpîda· to rope, cont.;
 wó·nî to pluck, wó·ponî to pluck, mom.

Two stems in the data beginning in / w /, wáikî three and wísítimá·mî ten show / w / as the repeated consonant when they occur in combination with 52 distributive.

Examples:

wáikî three, wáʔawaikî by threes;
 wísítimá·mî ten, wíʔíwí·sítimá·mî by tens.

Morphemes which otherwise appear as / C^{non-m,l,hʋʔ}... /

(where C^{non-m,l,h} is any consonant other than m, n, ŋ, h, or l) appear without the medial / ʔ / when they occur in combination with any of the reduplicatives 50.

Examples:

kóʔi corpse, kókoi corpses;

kóʔi to die, pl. actor, kóko· to be sick, pl. actor;

ʔúʔa to take pl. objects, ʔúʔu· to take pl. objects,

cont..

Morphemes which otherwise appear as / C^{vl}ʔh... / or as / wʔh... / appear without the medial / h / when they occur in combination with 50.

Examples:

káhió leg, kákio legs;

wúhi eye, wú·pui eyes.

2.2.2. Alternants of the cancellation morpheme lll non-present (see 3.) are treated in this subsection.

lll non-present is characterized, in most of its occurrences, by the cancellation of a stem final consonant plus vowel. The final consonant plus vowel of one stem may be different from that of another, thus, like reduplication, lll non-present is somewhat suppletive in nature: for example, wá·ki to enter, wá· to enter, non-present; nó·d̥i to bend, nó· to bend, non-present; só·m̥i to sew, só· to sew, non-present.

Alternants of lll non-present are listed according to their interphonemic specification below. (The notation ...(CV) will stand for a final portion which is cancelled in a given occurrence of lll non-present; ...CV, etc. for the

stem which combines with lll. Certain alternants of lll show, in addition to the cancellation of a final CV, addition of one or more phonemes; added phonemes are enclosed in diagonals in the specification).

lll.1: ...CV + lll = ... (CV) (simple cancellation without change in non-cancelled phonemes):

mú·ki to die, sg. actor, mú· to die, sg. actor, non-present;

má·kî to give, má· to give, non-pres.;

čákîdî to vaccinate, čákî to vaccinate, non-pres.;

ʔá·gî to tell, ʔá· to tell, non-pres.;

wúhanî to wake, wúha to wake, non-pres.;

wáhuđî to sweat, wáhu to sweat, non-pres.;

wáʔučî to wet, wáʔu to wet, non-pres.;

číhanî to hire, číha to hire, non-pres..

lll.2: ...CV + lll = ... (CV) + / · / (cancellation of stem final CV and addition of length):

hímî to go, hí· to go, non-pres.;

máđî to run, sg. actor, má· to run, sg. actor, non-pres.;

čáʔîhidî to cover, čáʔîhi· to cover, non-pres.;

kómîbisî to confess, kómîbi· to confess, non-pres.;

sónakî to chop, sóna· to chop, non-pres..

lll.3: ...v^{non-î}CV + lll = ...î(CV) (cancellation of stem final CV with preceding V becoming / î /):

húđunî to descend, húđî to descend, non-pres.;

čísáʔî to rise, ride, čísî to rise, ride, non-pres.;

wámîgî to wake up, wámî to wake up, non-pres.;

čikápani to work, čikápi to work, non-pres..

111.4: ...CV + 111 = ...(CV) + / i / (cancellation of final CV and addition of / i /):

ʔuʔa to take pl. objects, ʔui to take pl. objects, non-pres.;

máhi to burn, mái to burn, non-pres.;

gáʔi to roast, gái to roast, non-pres..

111.5: ...V̇CV + 111 = ...V̇(CV) + / i / (cancellation of final CV and preceding length and addition of / i /):

sá·d̄i to herd, sái to herd, non-pres.;

ná·d̄i to kindle, nái to kindle, non-pres.;

kó·s̄i to sleep, kói to sleep, non-pres.;

má·č̄i to know, mái to know, non-pres..

111.6: ...ʔa + 111 = ... (ʔ)a (cancellation of pre-final / ʔ /):

híʔa to urinate, hía to urinate, non-pres.;

bíʔa to dish out food, bía to dish out food, non-pres.;

múʔa to kill a sg. object, múa to kill a sg. object, non-pres..

111.7: ...CV, ...V̇, ...V + 111 = ...CV, ...V̇, ...V
(a zero alternant of 111):

wía to trample, ruin, wía to trample, ruin, non-pres.;

čúʔakad̄i to stab, čúʔakad̄i to stab, non-pres.;

sá·muḡi to shake, sá·muḡi to shake, non-pres.;

wák̄i· to milk, squeeze, wák̄i· to milk, squeeze, non-pres..

111.8: ...CV + 111 = ... (CV) + / d̄i / (cancellation of stem final CV and addition of / d̄i /):

giuʒani to strike a match, giuʒadi to strike a match,
non-pres.;

hukas̄i to scratch several times, hukadi to scratch
several times, non-pres..

111.0: ...CV + 111 = ... (CV) + / n̄i / (cancellation
of stem final CV and addition of / n̄i /; an alternant occur-
ring only with the stem below):

?̄i·bidi to fear, ?̄i·bini to fear, non-pres..

111.10: ...aCV + 111 = ...i(CV) + / hai / (cancellation
of final CV, with preceding V becoming / i /, plus addition of
/ hai /; an alternant occurring only with the stem below):

kawani to quarrel, kawaihai to quarrel, non-pres..

2.2.3. The suffix 121: -?̄i hortative has a single
alternant. In this subsection, we are concerned with the
alternants of stems in combination with 121.

Stems which combine with 121 are members of verb sub-
class V_{1a} . Most members of V_{1a} share the interphonemic speci-
fication CVC^6V (where $C^6 = / ?̄, h /$).

Members of V_{1a} which, when unaccompanied by affixes,
appear as / Cí?̄a /, appear as / Cía· / in combination with 121:

hi?̄a to urinate, hía·?̄i to urinate, hortative;

bí?̄a to dish out food, bíá·?̄i to dish out food, hort..

Stems which, when they occur unaccompanied by affixes,
appear as / CV₁C⁶i /, appear as / CV[·]₁ / when they occur in
combination with 121:

bíhi to take a sg. object, bí·?̄i to take a sg. object,
hort.;

káʔi to bite, ká.ʔi to bite, hort.;

kóʔi to die, pl. actor, kó.ʔi to die, pl. actor, hort.;

wíʔi to stay, wí.ʔi to stay, hort..

Stems which, when unaccompanied by affixes, appear as / CV₁a, a· / or as / CV· /, appear respectively as / CV₁a· / or / CV· / when they occur in combination with l2l:

wía to trample, ruin wía.ʔi to trample, ruin, hort.;

wúa· to throw a sg. object, wúa.ʔi to throw a sg. object, hort.;

mú· to wound, mú.ʔi to wound, hort..

Two stems share the specification / Cúʔa / but show non-analogous alternants before l2l.

A stem glossed as to kill a single object appears as / múʔa / when unaccompanied by affixes and as / múa·- / in combination with l2l:

múʔa to kill a sg. object, múa.ʔi to kill a sg. object, hort..

A stem glossed as to take pl. objects appears as / ʔúʔa / when unaccompanied by affixes and as / ʔú·- / before l2l:

ʔúʔa to take pl. objects, ʔú.ʔi to take pl. objects, hort..

2.2.4. The environments of the alternants l3l.: -ahim̄ and l3l.2: -him̄ progressive (see 3.) are specified below.

Alternant l3l.1: -ahim̄ occurs following morphemes having the specification { ...CA }:

{ hí·KA } / hí·k̄ / to mow, { hí·KA + l3l } / hí·kahim̄ / to mow, progressive;

† číkápanA † / číkápaná / to work, † číkápanA + 131 †
/ číkápanahimí / to work, prog..

The alternant 131.2: -himí occurs following morphemes having the specification † ...CV^{non-A} † or † ...V †:

† mú·ki † / mú·ki / to die, sg. actor, † mú·ki + 131 †
/ mú·kihimí / to die, sg. actor, prog.;

† móika· † / móika· / to become soft, † móika· - 131 †
/ móika·himí / to become soft, prog..

2.2.5. The environments of alternants 152.1: -wo·, 152.2: -yo·, 152.3: -o·, 152.4: -io imperative plural (see 3.) are specified below.

Alternant 152.1: -wo· occurs after stems having the specification † CVCi- †:

† húgi- + 152 † / húgiwo· / to eat, imperative pl.;
† ?í?i + 152 † / ?í?iwo· / to drink, imperative pl.;
† báhi + 152 † / báhiwo· / to take a sg. object,
imperative pl..

Alternant 152.2: -yo· occurs after morphemes having the specification † ...V †:

† wákí· - 152 † / wákí·yo· / to milk, squeeze,
imperative pl.;
† číčáwi· - 152 † / číčáwi·yo· / to play, imperative pl..

The alternant 152.3: -o· occurs after morphemes having the specification † ...CA † or † ...CI †:

† číkápanA - 152 † / číkápano· / to work, imperative pl.;
† wí·nI - 152 † / wí·no· / to suck, imperative pl..

The alternant 152.4: -io occurs after stems having the

specification $\{ \dots VC^5 i \}$ (where C^5 is / k / or / g /):

$\{ wá \cdot pamigi - + 152 \}$ / $wá \cdot pamigio$ / to wake up,

imperative pl.;

$\{ wá \cdot piki + 152 \}$ / $wá \cdot pikio$ / to enter, imperative pl.

2.2.6. The environments of the alternants 161.1:

-ki and 161.2: -oki successive, having verbed (see 3.) are specified below.

The alternant 161.1: -ki occurs after stems having the specification $\{ \dots V' \}$ and after certain, list-specified, stems having the specification $\{ \dots CV \}$:

$\{ wúa^\circ - 161 \}$ / $wúa \cdot ki$ / having thrown a sg.object;

$\{ níokA - 161 \}$ / $níokiki$ / having spoken.

The alternant 161.2: -oki occurs after certain list-specified, stems having the specification $\{ \dots CV \}$:

$\{ níidA + 161 \}$ / $níidoki$ / having seen;

$\{ íí?i + 161 \}$ / $íí?oki$ / having drunk.

2.2.7. The environments of the alternants 221.2:

-ti and 221.2: -či sequence increment (see 3.) are specified below.

Alternant 221.1: -ti occurs in the environment $\underline{N} + 221$ 612 + $\underline{S}_{1,2,3}$ (see 3.2.3. and 4.2.):

$wó?otí \text{ } ?ámí$ ($\underline{N} + 221$ 612 + \underline{S}_1) at the pond, tank;

$?ú \cdot sítí \text{ } ?ání$ ($\underline{N} + 221$ 612 + \underline{S}_2) on the pole;

$pó \cdot tolítí \text{ } ?abí$ ($\underline{N} + 221$ 612 + \underline{S}_3) onto, against
the bronc.

Alternant 221.2: -či occurs in the environment $\underline{N} + 221$

612 + S₄:

kí·č̣ṭ ʔíq̣ṭ (N + 221 612 + S₄) in the house.

2.2.8. Environments in which the alternants 521.1: ʔa~a-, 521.2: ʔo~o-, 521.3: ʔV-, and 521.4: -u- non-specified mode (see 4.) occur are specified below.

Alternant 521.1: ʔa~a- occurs in the environments + 511, 512 + 521 + P_{1,2} + 531 and + 511, 512 + 521 + P_{3sp} + 531. The alternant without initial / ʔ / appears after 511 or 512.

Examples:

ʔap̣iṭ 2 sg., nonsp. mode, non-present (521 + P_{2s} + 531);

na-∅-ṭ 3 nonsp. no., interrogative, non-pres.

(512 + 521 + P_{3sp} + 531).

Alternant 521.2: ʔo~o- occurs in the environment + 511, 512 + 521 + P_{3sp}. The alternant without initial / ʔ / occurs after 511 or 512.

Examples:

ʔo~∅ 3 nonsp. no., nonsp. mode (521 + P_{3sp});

no~∅ 3 nonsp. no., interrogative (512 + 521 + P_{3sp}).

Alternant 521.3: ʔV- (vowel assimilated to a preceding vowel) alternates freely with alternants 521.1 and 521.2 in environments of the type ...V + 521 + P (where V is the final vowel of a preceding morpheme):

ḥma· ʔa-∅ ki ṃṭ ʔaʔaga·# or ḥma· ʔo~∅ ki ṃṭ ʔaʔaga·#

Someone is beckoning to you.

mú· ʔu-∅-ṭ# or mú· ʔa-∅-ṭ# He died.

?i. ?inid̥↓g̥i # or ?i. ?anid̥↓g̥i # I fell down.

Alternant 521.4: -u- occurs in the environment 513 +

521 + P + 531:

kup̥ 2 sg., introductive (513 + 521 + P_{2s});

kunid̥ 1 sg., intro., non-pres. (513 + 521 + P_{1s} + 531).

2.2.9. Environments in which the alternants 531.1: -t̥ and 531.2: -d̥ personal non-present (see 4.) occur are specified below.

Alternant 531.1: -t̥ occurs in the environments

...P_{2s,p} + 531, ...P_{1p} + 531, and ...P_{3sp} + 531:

nap̥t̥ 2 sg., inter., non-pres. (512 + 521 + P_{2s} + 531);

kit̥t̥ 1 pl., intro., non-pres. (513 + 521 + P_{1p} + 531);

ma-∅-t̥ 3 nonsp. no., subj., non-pres. (511 + 521 + P_{3sp} + 531).

Alternant 531.2: -d̥ occurs in the environment ...P_{1s} + 531:

n̥id̥ 1 sg., non-pres. (P_{1s} + 531).

2.2.10. Environments in which the alternants 541.1: ?á·- and 541.2: ...Ṽ... personal deictic (see 4. and 4.1.) occur are specified below.

Alternant 541.1: ?á·- occurs in the environment 541 + P_{1,2} + 710:

?á·pi?i 2 sg., deic., demonstrative sg. (541 +

$\underline{P}_2\underline{S} + 711$);

$\text{ʔá} \cdot \check{\text{c}}\text{im}\check{\text{a}}$ 1 pl., deic., dem. pl. (541 + $\underline{P}_1\underline{p}$ + 712).

Alternant 541.2: ...V... occurs in the environment

541 + $\underline{P}_3\underline{sp}$ + 710:

$\text{h}\acute{\text{a}}\text{ga}\text{ʔi}$ 3 nonsp. no., deic., dem. sg. (541 + $\underline{P}_3\underline{sp}$ + 711);

$\text{h}\acute{\text{a}}\text{gam}\check{\text{a}}$ 3 nonsp. no., deic., dem. pl. (541 + $\underline{P}_3\underline{sp}$ + 712).

2.2.11. The environments in which alternants of the prefixes 610 spatial deictic (see 4., 4.2.) occur are specified below.

Alternants 611.1: ʔi - proximal deictic, 613.1: $\text{g}\check{\text{i}}$ - ultradistal deictic, and 614.1: $\text{h}\check{\text{i}}$ - interrogative deictic occur in the environment 610 + \underline{S} :

$\text{ʔin}\check{\text{i}}$ around here, this way (611 + \underline{S}_2);

$\text{g}\check{\text{i}}\text{m}\check{\text{i}}$ there, out of sight (613 + \underline{S}_1);

$\text{h}\check{\text{i}}\text{b}\check{\text{i}}$ where, somewhere (614 + \underline{S}_3).

Alternants 611.2: $\text{ʔi}'$ - proximal deictic, 613.2: $\text{g}\acute{\text{a}}$ - ultradistal deictic, and 614.2: $\text{h}\acute{\text{i}}$ - interrogative deictic occur in the environment 610 + \underline{S} + 710:

$\text{ʔi}' \cdot \text{na}\text{ʔa}$ over here (611 + \underline{S}_2 + 711);

$\text{g}\acute{\text{a}}\text{ma}\text{ʔi}$ over there, beyond (613 + \underline{S}_1 + 711);

$\text{h}\acute{\text{i}}\text{dai}$ who (614 + \underline{S}_4 + 711).

The distribution of alternants of the prefix 612 distal deictic is as follows. Alternant 612.1: ʔá - occurs in the environment ...↓, # 612 + $\underline{S}_{1,2,3}$. Alternant 612.2: ʔá - occurs in the environments 612 + $\underline{S}_{1,2,3}$ + 711 and \underline{N} + 221 612 +

$\underline{S}_{1,2,3}$. Alternant 612.3: $\text{ʔ}^{\acute{a}}\text{-}$ occurs in the environment
 612 + \underline{S}_4 + 711.

Examples:

$\text{ʔam}^{\acute{a}}\text{}$ there, in that general direction (612 + \underline{S}_1);

$\text{ʔama}^{\acute{a}}\text{ʔi}$ over there (612 + \underline{S}_1 + 711);

$\text{w}^{\acute{o}}\text{ʔot}^{\acute{a}}\text{}$ $\text{ʔam}^{\acute{a}}\text{}$ at the pond, tank (\underline{N} + 221 612 + \underline{S}_1);

$\text{ʔ}^{\acute{o}}\text{ʔod}^{\acute{a}}\text{č}^{\acute{a}}\text{}$ $\text{ʔ}^{\acute{a}}\text{d}^{\acute{a}}\text{}$ in the sand (\underline{N} + 221 612 + \underline{S}_4);

$\text{ʔ}^{\acute{a}}\text{da}$ inside, then (612 + \underline{S}_4 + 711).

2.2.12. The environments in which the alternants

711.1: $-i^{\acute{a}}$, 711.2: $-a^{\acute{a}}$, 711.3: $-a^{\acute{a}}\text{i}$, 711.4: $-i^{\circ}$, 711.5: $-a^{\circ}$,
 and 711.6: $-a\text{i}$ demonstrative deictic, singular (see 4.) occur
 are specified below.

Alternant 711.1: $-i^{\acute{a}}$ occurs in the environment 541 +
 $\underline{P}_{1,2}\underline{S}$ + 711:

$\text{ʔa}^{\acute{a}}\text{ni}^{\acute{a}}\text{ʔi}$ 1 sg., deic., dem. sg. (541 + $\underline{P}_1\underline{S}$ + 711).

Alternant 711.2: $-a^{\acute{a}}$ occurs in the environment 611 +
 \underline{S} + 711:

$\text{ʔi}^{\acute{a}}\text{da}^{\acute{a}}$ this (611 + \underline{S}_4 + 711).

Alternant 711.3: $-a^{\acute{a}}\text{i}$ occurs in the environments 612 +
 $\underline{S}_{1,2,3}$ + 711; 541 + $\underline{P}_3\underline{sp}$ + 711:

$\text{ʔaba}^{\acute{a}}\text{ʔi}$ over there (612 + \underline{S}_3 + 711);

$\text{h}^{\acute{a}}\text{ga}^{\acute{a}}\text{ʔi}$ 3 nonsp. no., deic., dem. sg. (541 + $\underline{P}_3\underline{sp}$ +
 711).

Alternant 711.4: $-i^{\circ}$ alternates freely with 711.1 in
 the environment 541 + $\underline{P}_{1,2}\underline{S}$ + 711:

$\text{ʔa}^{\acute{a}}\text{pi}^{\acute{a}}\text{ʔi}$ or $\text{ʔa}^{\acute{a}}\text{pi}^{\circ}$ 2 sg., deic., dem. sg. (541 + $\underline{P}_2\underline{S}$ +
 711).

Alternant 711.5: -a· occurs in the environment 612 + S₄ + 711 and alternates freely with 711.2 in the environment 611 + S + 711:

?ída· inside, then (612 + S₄ + 711);

?í·ya?a or ?í·ya· right here (611 + S₅ + 711).

Alternant 711.6: -ai occurs in the environment 614 + S + 711 and alternates freely with 711.3 in the environments 612 + S_{1,2,3} + 711 and 541 + P_{3sp} + 711:

hábai where (614 + S₃ + 711);

?ána?i or ?ánai over there (612 + S₂ + 711);

hága?i or hágai 3 nonsp. no., deic., dem. sg. (541 + P_{3sp} + 711).

2.2.13. The environments of the alternants 811.1: -ho· and 811.2: -o· times (see 4., 4.3.) are specified below.

Alternant 811.1: -ho· occurs following morphemes having the specification † ...C^m †; alternant 811.2: -o· occurs following morphemes having the specification † ...C^{non-mv} †:

† wísítimá·mí + 811 †/ wísítimá·mího· / ten times;

† hátasípí + 811 †/ hátasípo· / five times.

2.2.14. Alternants of members of the various minor stem classes (see 4.) are treated in this subsection.

Three members of P(ronoun) (see 4.1.) have multiple alternants: P_{1s} nî ~ nî 1 sg., P_{2p} mî ~ -pi- 2 pl., and P_{3sp} hága ~ gA ~ ∅.

Alternant / nî / of P_{1s} occurs in the environment † 510 + 520 + P_{1s}, and the alternant / nî / occurs in the

environment ...P_{1s} + 531:

naní 1 sg., inter., (512 + 521 + P_{1s});

nanídí 1 sg., inter., non-pres. (512 + 521 + P_{1s} + 531).

Alternant / mí / of P_{2p} occurs in the environments + 510 + 520 + P_{2p}- + 530 and + P_{2p} + 531. Alternant / -pi- / occurs in the environment 541 + P₂ + 712:

kumítí 2 pl., intro., non-pres. (513 + 521 + P_{2p} + 531);

?á·pimí 2 pl., deic., dem. sg. (541 + P_{2p} + 712).

The three alternants of P_{3sp} occur as follows:

P_{3sp} appears as \emptyset in the environments + 510 + 520 + P_{3sp} + 531 and P_{3sp} + 531, as / hígA / in the environment 541 + P_{3sp} + 710 and when unaccompanied by affixes, and as / gA /, alternating freely with / hígA /, when unaccompanied by affixes in contour medial environments:

hígí ~ gí 3 non-sp. no. (P_{3sp});

hígamí 3 nonsp. no., deic., dem. pl. (541 + P_{3sp} + 712);

na- \emptyset -tí 3 nonsp. no., inter., non-pres. (512 + P_{3sp} + 531);

\emptyset -tí 3 nonsp. no., non-pres. (P_{3sp} + 531).

Two members of S (patial) show multiple alternants:

S₄ dí ~ -dA this, general spatial temporal, in and S₅

?i ~ -y ~ -a here (see 4.2.).

The two alternants of S₄ occur as follows: / -dA / occurs in the environment 611 + S₄ + 710, and / dí / occurs in

the environment + 612, 613, 614 + \underline{S}_4 ... :

ʔi·daʔa this (611 + \underline{S}_4 711);

ʔi·da· inside, then (612 + \underline{S}_4 + 711);

gid± beyond, there, then (long ago) (613 + \underline{S}_4);

hídai who (614 + \underline{S}_4 + 711).

The three alternants of \underline{S}_5 occur as follows: \underline{S}_5 appears as / ʔi / when unaccompanied by affixes, as / -y- / in the environment 611 + \underline{S}_5 + 711, and as / -a / in the environments 611 + \underline{S}_5 and 613 + \underline{S}_5 .

ʔi here (\underline{S}_5);

ʔi·yaʔa right here (611 + \underline{S}_5 + 711);

ʔia here (611 + \underline{S}_5);

ga beyond, away from here (613 + \underline{S}_5).

A single member of Q(uantifier) shows multiple alternants: Q_{12} h́ma· ~ h́má- one (see 4.4.). Q_{12} appears as / h́má- / in the environment Q_{12} + 811 and as / h́ma· / elsewhere:

h́ma· one (Q_{12});

h́máho· once (Q_{12} + 811);

h́ma·pa· one place, together (Q_{12} + 812).

FOOTNOTE TO CHAPTER II

1. A projected general dictionary of Papago includes provisions for list-specified environments of morpheme alternants. Each entry in the projected dictionary is to be followed immediately by its combination with one or more of the reduplicatives in decade 50 and, in the case of members of stem class V(erb), by its combination with 111 non-present. Those entries which are members of V₁ (see 3.1.1. for definition of subclasses V₁, V₂, and V₃) are followed by their combination with 53 continuative, 51 plural (if they so combine), and with 111 non-present; members of V₂ are followed by their combination with 54 momentaneous and 111 non-present (which obligatorily co-occurs with 54 in combination with V₂); members of V₃ are followed by their combination with 51 plural (if they so combine) and with 111 non-present. Entries which are members of N(oun) are followed by their combination with 51 plural (if they so combine), and members of A(tribute) are followed by their combination with one or the other of the reduplicatives 51 plural or 52 distributive (if they so combine). For definitions of major stem classes V, N, and A, see Chapter III., subsections 3.1., 3.2., and 3.3.

CHAPTER III

MAJOR STEMS AND AFFIXES

3. This chapter is concerned with morpheme sequences in which members of the major stem classes occur in combination with affixes. Major stem classes are those having large, dictionary-size inventories and which, as classes, recur frequently in textual material (though an individual member of a given stem class may recur only infrequently in texts). This is in direct contrast to minor stems which are low inventory and individually frequent in texts.

Major stem classes are three in number: V(erbs), N(ouns), and A(ttributes). The establishment of each of these classes is attested by virtue of combination with certain affixes or sets of affixes termed DIVISIVES. An affix is said to be divisive if it is exclusively associated with members of a single class of stems. It is diagnostic of that class if it may combine with all its members; it is diagnostic of a subclass if it may combine only with certain members of a large class of stems.

As a prerequisite to the discussion of each of the major stem classes and their combination with affixes, we present an inventory of the affixes with which they combine. Following the inventory, we state the combinatory privileges of each affix (i.e., stems with which each affix may combine) and the relationships of order which obtain between affixes in

combination with a member of a given stem class (i.e., the position of affixes in the word).

In the inventory, each affix is supplied with an index number by which it is represented in formulae throughout the remainder of this study. Affixes showing index numbers below 100 are prefixes or, in the case of 50, manipulatives (reduplicatives) associated with the beginning of a stem. Affixes showing index numbers 100 through 400 are suffixes or, in the case of 111 non-present, a manipulative (cancellation) associated with the end of a stem. Index numbers are grouped into decades including mutually exclusive and distributionally similar affixes. Suffixes are grouped into centuries according to their stem association; suffixes 100 are exclusively associated with V, 200 with N, and 300 with A. Suffixes 400 combine with members of all three major stem classes.

The inventory is as follows (each affix is followed by a parenthetical notation indicating its stem association); see 2.2. above for distribution of multiple alternants:

- 10 11: s_i- intensive (V, N, A).
- 20 21: ta- indefinite agent (V);
 22: ču- indefinite object (V).
- 30 31: ?_i- non-1 reflexive, suus (V, N);
 32: ha- 3 pl. goal, possessor (V, N).
- 40 41: n_i- 1 sg. goal, possessor (V, N);
 42: m_i- 2 sg. goal, possessor (V, N);
 43: t_i- 1 pl. goal, possessor (V, N);
 44: ?_im_i- 2 pl. goal, possessor (V, N).

- 50 51: (reduplicative) plural (V, N, A);
 52: (reduplicative) distributive (V, A);
 53: (reduplicative) continuative (V);
 54: (reduplicative) momentaneous (V).
- 100 Suffixes exclusively associated with V:
- 110 111: (cancellation) non-present (V);
 120 121: -[?]i hortative (V);
 130 131.1: -ahm̄, 131.2: -him̄ progressive (V);
 140 141: -dA durative (V).
 150 151: -n̄ imperative singular (V);
 152.1: -wo°, 152.2: -yo°, 152.3: -o°, 152.4: -io
imperative plural. (V).
 160 161.1: -k̄, 161.2: -ok̄ successive, having verbed (V);
 162: -č̄ contemporaneous, while verbing (V).
- 200 Suffixes exclusively associated with N:
- 210 211: -ḡ existential (N).
 220 221.1: -t̄, 221.2: -č̄ sequence increment (N).
 230 231.1: -ga°, 231.2: -ka° alienable possession (N).
 240 241.1: -ž̄, 3 sg. possessor (N).
 250 251: -kaž̄ instrumental (N).
- 300 Suffixes exclusively associated with A:
- 310 311: -ž̄ predicative (A).
 320 321: -ču[?]u abstractive (A).
- 400 Suffixes having common stem association:
- 410 411: -m̄ adverbial₁ (V, N, A);
 412: -ma° adverbial₂ (V, N, A).
 Affixes 20, 53, 54, and 100, totaling twelve, are

divisive for V or for subclasses thereof. Of these, one, 131 progressive, is diagnostic of the class as a whole. Suffixes 200, five in number, are divisive for N; of these, all except 231 alienable possession are diagnostic of the class as a whole. Suffixes 300, two in number, are divisive for A; of these, 321 abstractive is diagnostic of A.

In the immediately following paragraphs, the relationships of order (relative order positions) for each of the affixes are defined. Prefixes are defined as occurring word initially (i.e., not preceded by other prefixes) in some or all of their occurrences, word medially in some or all of their occurrences, or adjacent to the stem (i.e., not followed by other prefixes) in some or all of their occurrences. Similarly, suffixes are defined as occurring word finally (i.e., not followed by other suffixes) in all or some of their occurrences, medially in all or some of their occurrences, or adjacent to the stem (not preceded by other suffixes) in all or some of their occurrences. Each discussion of an affix or set of distributionally similar affixes is accompanied by a parenthetical reference to one or more following subsections in which actually occurring sequences are treated.

Prefix 11 si- intensive occurs word initially in all occurrences; it may or may not occur adjacent to the stem. In combination with certain members of V it may be followed by prefixes 30 or 40 and/or 53, 54 in sequences of the type + 30, 40 + 53, 54 + V... (for actually occurring sequences of this type see 3.1.4.2; in the formula, items separated by

a comma are mutually exclusive). Example: sihawípiá to ruin them, cont. (11 + 32 + 53 + tr V_{1a}sp in). In combination with members of V, 11 may be followed by one or the other of the prefixes 20 in sequences of the type + 11 + 20 + V... (see 3.1.4.3.). Examples: sítaʔí·bidamí frightening (11 + 21 + tr V₂sp + 411); síčuʔí·bidamí fearful (11 + 22 + tr V₂sp + 411). In combination with members of N or A, prefix 11 may be followed by 51 in sequences of the types + 11 + 51 + N... (see 3.2.2.) and + 11 + 51 + A... (see 3.3.). Examples: síbá·banagí full of coyotes (11 + 51 + al N sp + 211); síʔúʔamí yellow, pl. (11 + 51 + adv₂A₁sp). for additional examples of 11 see the subsections referred to above.

Prefixes 20: 21 ta- indefinite agent and 22 ču- indefinite object, combining exclusively with members of V, occur in position adjacent to the stem in all occurrences; they occur word initially in some occurrences. They may be preceded by 11 in sequences of the type + 11 + 20 + V... (see 3.1.4.3.). Example: taníidáma· worth seeing (21 + tr V₂sp + 412). For additional examples see above under prefix 11 and in subsection 3.1.4.3. below.

Prefixes 30: 31 ʔí- non-1 reflexive, suus; 32 ha- 3 pl. goal, possessor are mutually exclusive. They occur word initially in some occurrences, medially in some, and adjacent to the stem in some occurrences. In combination with certain members of V, they may be preceded by 11 and followed by 53 or 54 in sequences of the type + 11 + 30 + 53, 54 + V... (see 3.1.4.2.). Example: síʔíwí·himí to ruin self

(non-first person), prog. ($11 + 31 + \text{tr } V_{1a} \text{ sp} + 131$);
sihagi'gi to strike them, non-present ($11 + 32 + 54 + \text{tr } V_2 \text{ sp} +$
 111). In combination with certain V, prefix 32 is obliga-
 torily followed by 51, and 31 may or may not be: $+ 32 + 51 +$
 $V...$ and $+ 31 + 51 + V...$ (see 3.1.2. under tr V spp). Ex-
 amples: hawu'pi to rope them, non-pres. ($32 + 51 + \text{tr } V_{1b} \text{ spp} -$
 111); ?idai to put self, non-pres. ($31 + \text{tr } V_{1b} \text{ spp} + 111$);
?ida'disi to put selves ($31 + 51 + \text{tr } V_{1b} \text{ spp}$). In combina-
 tion with certain members of V, prefix 32 may be followed by
 40 and 51 in sequences of the type $+ 32 + 40 + 51 + V...$
 (see 3.1.2. under double tr V). In this way, 32 differs in
 its distribution from 31 (in Tecolote, a closely related and
 mutually intelligible dialect, prefix 31 may be followed by
 prefix 44 2 pl. goal, possessor). Example of $32 + 40 + 51 +$
 V : hamiwapi'konu to wash them for you, non-pres. ($32 + 42 +$
 $51 + \text{double tr } V_3 \text{ spp} + 111$). In combination with members of
N, prefixes 30 occur word initially in all occurrences; they
 may be followed by 51 in sequences of the type $+ 30 + 51 + N...$
 (see 3.2.1.). Example: hato'tonu their knees ($32 + 51 +$
inal N sp).

Prefixes 40, 41 ni- 1 sg. goal, possessor; 42 mi-
2 sg. goal, possessor; 43 ti- 1 pl. goal, possessor; 44 ?imi
2 pl. goal, possessor are mutually exclusive. They occur
 initially, medially and/or adjacent to the stem. In combina-
 tion with certain members of V, they may be preceded by 11
 and followed by 53 or 54 in sequences of the type $+ 11 + 40 +$
 $53, 54 + V...$ (see 3.1.4.2.). Examples: sihagi'gi to strike

me, non-pres. (11 + 41 + 54 + tr V₂sp + 111); sipimámíčiči°
to get myself to know it well, cont. (11 + 41 + 53 + tr V_{1b}sp)
 In combination with certain V, prefixes 40 may be preceded by
 32 and followed by 51 in sequences of the type + 32 + 40 + 51 +
V... (see 3.1.2. under double tr V). Example: hanádáda-
gákonidí to wipe them for me (32 + 41 + 51 + double tr V₃spp).
 In combination with certain V, prefixes 43 and 44 are obliga-
 torily followed by 51 in sequences of the type + 43, 44 + 51 +
V... (see 3.1.2. under V spp). Example: ʔámírókísidí to put
you (pl. to sleep (44 + 51 + tr V₃spp). In combination with
 certain V, prefixes 40 may be followed by 53, 54 in sequences
 of the type + 40 + 53, 54 + V... (see 3.1.3.). Examples:
tímámíka° to give (it) to us, cont. (43 + 53 + double tr V_{1b}sp);
máčíčiči to name you, non-pres. (42 + 54 + tr V₂sp + 11).
 Prefixes 40 are initial in all combinations with members of
N. In combination with certain members of N, they may be
 followed by 51 in sequences of the type + 40 + 51 + N... (see
 3.2.1.). Examples: náwú·pui my eyes (41 + 51 + inal N sp);
tínó·níhoi our hands (43 + 51 + inal N sp).

The reduplicatives 50 are mutually exclusive. They are
 distributionally somewhat dissimilar and are treated in separate
 paragraphs as follows:

51 plural, combining with V, N, and A, may or may not
 be preceded by prefixes. In combination with certain members
 of V, it may be preceded by 30 or 43, 44 in sequences of the
 type + 30, 43, 44 + V... (see 3.1.2. under V spp). Example:
hačú·čiči to extinguish them (32 + 51 + tr V_{1b}spp). In

combination with certain V, 51 may be preceded by the prefix sequence 32 + 40 in sequences of the type + 32 + 40 + 51 + V... (see 3.1.2. under double tr V spp). Example: hatáwápíkonið to wash them for us (32 + 43 + 51 + double tr V₃spp). In combination N, 51 may be preceded by 11 or by 30, 40 in sequences of the types + 11 + 51 N... (see 3.2.2.) and + 30, 40 + 51 + N... (see 3.2.1.). Examples: sítótobigá full of cottontails (11 + 51 + al N sp + 211); niwípísilo'ga'my calves (41 + 51 + al N sp + 231). In combination with certain members of A, 51 may be preceded by 11 in sequences of the type + 11 + 51 + A... (see 3.3. under A₁sp). Example: síčúč'íkí black, pl. (11 + 51 + adv₂A₁sp).

52 distributive, combining with V and A, may or may not be preceded by prefixes. In combination with at least one member of V, it may be preceded by one or the other of the prefixes 30 in sequences of the type + 30 + 52 + V... (see 3.1.4.4.). Example: halá'ála'asípí to trap them, dist. (32 + 52 + tr V_{1b}sppd). 52 occurs word initially in all combinations with members of A (see 3.3. under A₂). Example of + 52 + A...: só'osípolíkí short, dist. (52 + non-pred A₂).

53 continuative, combining with members of V, may or may not be preceded by prefixes. In combination with certain members of V, it may be preceded by 11 and 30, 40 in sequences of the type + 11 + 30, 40 + 53 + V... (see 3.1.4.2. and above under 11 and 30, 40). In combination with certain V, 53 may be preceded by prefixes 30, 40 in sequences of the type + 30, 40 + 53 + V... (see 3.1.3. in connection with tr).

double tr V₁, and above under 30, 40). In combination with at least one member of V, 53 may be preceded by the prefix sequence 32 + 40 in sequences of the type + 32 + 40 + 53 + V... (see 3.1.3. in connection with double tr V_{1b}sp). Example: hamámáka* to give them to you, cont. (32 + 42 + 53 + double tr V_{1b}sp).

54 momentaneous, combining with certain members of V, may or may not be preceded by prefixes. In combination with some V, it may be preceded by 11 and 30, 40 in sequences of the type + 11 and 30, 40 in sequences of the type + 30, 40 + 54 + V... (see 3.1.4.2., and above under 11, 30, and 40). In combination with certain V, 54 may be preceded by 30 or 40 sequences of the type + 30, 40 + 54 + V... (see 3.1.3. in connection with tr V₂, and above under 30, 40).

Suffixes 100, combining with members of V, are treated in the following paragraphs.

111 (cancellation) non-present is incompatible with all suffixes. It combines in sequences of the type ...V + 111 (see 3.1.1. and 3.1.3. for sequences in which 111 occurs). Example: wú' to rope, non-pres. (tr V_{1b}spp + 111).

Suffix 121 -ʔi hortative occurs adjacent to the stem and word finally in all occurrences (i.e., as 111, it is incompatible with all other suffixes). It combines in sequences of the type ...V + 121 (see 3.1.1. under V_{1a} and 3.1.3.). Example: mú'ʔi to wound, hortative (tr V_{1a}sp + 121).

Suffix 131 -ahimí ~ -himí progressive occurs adjacent

to the stem and word finally in all occurrences. It combines in sequences of the type ...V + 131 (see 3.1.1., 3.1.3., and 3.1.5.). Example: máihimá to burn, prog. (intr V_{1a}sp + 131).

Suffix 141 -dA durative occurs adjacent to the stem in all occurrences; it may or may not be followed by other suffixes. In combination with certain V, it may be followed by one of the suffixes 150 or 162 in sequences of the types V + 141 + 150 (see 3.1.3.) and ...V + 141 + 162 (see 3.1.4.1. in connection with sequences in which members of V₁ combine with 162). Examples: kó'sádaná You (sg. keep on sleeping! (intr V_{1b}spp + 141 + 151); máda³čá⁴ while running (intr V_{1b}s + 141 + 162); píokadá to speak, dur. (intr V₃spp + 141). See 3.1.1. for additional examples of V + 141.

Suffixes 150: 151 -ná imperative sg. and 152 -wo~yo~ -o~io imperative pl. are mutually exclusive. They occur word finally in all occurrences and adjacent to the stem in some occurrences. In combination with certain V, they may be preceded by 141 in sequences of the type ...V + 141 + 150 (see 3.1.3.). Examples: číkápanádaná You (sg.) keep working! (intr V₃sp + 141 + 151); gí[?]iwo^o You (pl.) get fat! (intr V_{1a}sp + 152). For additional examples of V + 150, see 3.1.2.

Suffixes 160: 161 -ká ~ -oká successive and 162 -čá contemporaneous are mutually exclusive. They occur word finally in all occurrences. Suffix 161 occurs adjacent to the stem in all occurrences; it combines in sequences of the type ...V + 161 (see 3.1.4.1.). Example: čá[?]íká having said (intr V_{1a}sp + 161). Suffix 162 is obligatorily preceded by 141 in

combination with certain V; in combination with certain other V, it obligatorily occurs adjacent to the stem; sequences in which 162 combines are of the following types: ...V + 141 ± 162 and ...V ± 162 (see 3.1.4.1.). Examples: níokiči while speaking (intr V₃spp + 162); dá[?]a₃čiči while jumping, flying (intr V_{1a}s + 141 + 162).

Suffixes 200, combining with members of N, are treated below.

Suffixes 211 -gī existential (see 3.2.2.) and 221 -tī ~ -čī sequence increment (see 3.2.3.) occur adjacent to the stem and word finally in all occurrences (i.e., they are incompatible with all other suffixes). They combine in sequences of the types ...N ± 211 (see 3.2.2.) and ...N ± 221 (a sequence of the type N + 221 is always followed immediately by a member of minor stem class S(patial) preceded by the prefix 612 distal; see 3.2.3.). Examples: sičú[?]wagi full of cottontails (ll + al N s + 211); kí[?]čiči in the house (inal N sp + 221 612 + S₄).

Suffix 231 -ga[?] ~ -ka[?] alienable possession occurs adjacent to the stem in all occurrences; it occurs word finally in some occurrences. It may be followed by suffixes 241 and/or 251 in sequences of the type ...N + 231 ± 241 ± 251 (see 3.2.1. under al N). Example: ú[?]siga[?]čiči by means of his (obviative) stick (al N sp + 231 + 241 + 251).

Suffix 241 -čī 3 sg. possessor occurs adjacent to stem, medially, or finally. In combination with certain N, it is obligatorily preceded by 231 and may be followed by 251.

In combination with certain other N, it occurs adjacent to the stem and may be followed by 251. Sequences in which 241 combines are of the following types: $\dots\text{N} + 231 \pm 241 \pm 251$ (see 3.2.1. under al N, and above under 231); and $\dots\text{N} \pm 241 \pm 251$ (see 3.2.1. under inal N). Example: hú·čičižkaž by means of its (obviative claw (inal N sp + 241 + 251)).

Suffix 251 -kaž instrumental occurs word finally in all occurrences. It occurs adjacent to the stem in some occurrences. It may be preceded by 231 and/or 241 in sequences of the types $\dots\text{N} + 231 \pm 241 \pm 251$ (see 3.2.1.) and $\dots\text{N} \pm 241 \pm 251$ (see 3.2.1., and above under 241). Examples: wí·bažkaž by means of her (obviative) milk (inal N s + 241 + 251); ʔú·sikaž by means of a stick (al N sp + 251).

Suffixes 300, combining with members of A, are treated in the following paragraphs.

Suffix 311 -ž predicative occurs adjacent to the stem and word finally in all occurrences. Sequences in which 311 combines are of the type $\dots\text{A} \pm 311$ (see 3.3. under pred A₂). Example: čímaž small, pred. (pred A₂ + 311).

Suffix 321 -čuʔu abstractive occurs adjacent to the stem and word finally in all occurrences. It combines in sequences of the type $\dots\text{A} \pm 321$ (see 3.3.). Example: gíʔičuʔu something big (pred A₂ + 321).

Suffixes 400, combining with members of V, N, and A, are treated in the following paragraph.

410: 411 -m adverbial₁ and 412 -ma adverbial₂ are mutually exclusive; they occur adjacent to the stem and word

finally in all occurrences. They combine in sequences of the type ...V, N, A + 410 (see 3.1.4.3., 3.2.2., and 3.3.). Examples: sihímimá would like to go (11 + intr V₃spp + 411); sitóníma hot, adv. (11 + adv₂A₁s + 412); sibáníma coyote like (11 + al N sp + 412).

Prefixes and suffixes which combine with members of the various major stem classes are listed in inventory above, and their relative order in sequence is shown in the above paragraphs. The following sections, 3.1. (V), 3.2. (N), and 3.3. (A), treat the co-occurrence of these affixes in combination with stems and the combinatorial relationship which obtains between stems and affixes.

3.1. Morpheme sequences in which members of the general class of V(erbs) occur in combination with affixes are treated in the present section. In each instance we define the combinatorial relationship between members of V and affixes. The result of this operation is the establishment of subclasses of the general class of V. Also, we define the co-occurrence relationship between affixes in combination with members of the subclasses of V. This operation results in a description of certain morpheme sequences which occur in the corpus.

Affixes which combine with members of V are those showing index numbers 10, 20, 30, 40, 50, 100, and 400. Of these affixes, those showing index numbers 20, 53, 54, and 100 are exclusively associated with V, hence, they are divisive for V or for subclasses thereof.

Of the affixes which are exclusively associated with

V, suffix 131. -ahimá ~ -himá progressive provides a frame which is diagnostic of V; that is, all members of V may combine with 131, and that suffix combines only with members of V.

Examples of V + 131 follow:

kó[?]ihimá to die, plural actor, progressive (intr V
1aP + 131),

mú·kihimá to die, single actor, progressive (intr V
1bS + 131),

ǰ[?]·p[?]ihimá to smoke, progressive (tr V₂sp + 131),

číkápanahimá to work, progressive (intr V₃sp + 131),

kí·kahimá to live, progressive (stative V + 131),

móika·himá to become soft, progressive (att V sp + 131).

The criterion for membership in the large class of V stems is association with 131. Members of V are further subclassified according to their association with affixes or sets of affixes in addition to 131.

Association with members of two different sets of affixes serves as a criterion for the establishment of several cross-cutting but independent subclasses. One of these sets of affixes has reference to such categories as tense and aspect; affixes belonging to this set are: 53 CV[?](V)...V[?] continuative, 54 CV[?]CV... momentaneous, 111 ... (CV) non-present, 121 -[?]i hortative, 131 -ahimá ~ -himá progressive, and 141 -dA durative. The other set of affixes has reference to such categories as person and number; affixes belonging to this set are: 31 [?]i- non-1 reflexive, suus; 32 ha- 3 plural goal,

possessor; 41 ni- 1 sg. goal, possessor; 42 mi- 2 sg. goal, possessor; 43 ti- 1 pl. goal, possessor; 44 ʔimɨ 2 pl. goal, possessor; 51 CVCV... (and other alternants, see 2.2.1.)
plural; 151 -ni imperative singular; and 152 -wo'~ -yo'~ -o'~ -io imperative plural.

A subclass attested by virtue of its association with certain of the affixes in one of these sets is further sub-classified according to its association with certain affixes in the other set. Thus, a subclass V_1 , attested by virtue of its combination with the affixes 53, 111, 131, and 141, has, among others, the subclasses tr V_1 , combining with affixes 30, 40, and 150, and intr V_1 , combining with affixes 150 and incompatible with 30, 40.

Subclasses attested by virtue of association with certain of the affixes 53, 111, 121, 131, and 141 are listed below.

V_1 labels a subclass of V whose members combine with affixes 53, 111, 131, and 141. Those members of V_1 which may combine with 121, in addition to the above listed affixes, are labeled V_{1a} (examples: intr $V_{1a}sp$ niʔi to sing; tr $V_{1a}sp$ baʔa to swallow, to eat). Those members of V_1 which are incompatible with 121 are labeled V_{1b} (examples: intr $V_{1b}s$ mu'ki to die, single actor; tr $V_{1b}sp$ wu'dɨ to rope, tie). Of the affixes combining with members of V_1 , 53 and 121 are exclusively associated with V_1 ; affix 53 combines with all members of V_1 , and suffix 121 combines with members of the subclass V_{1a} .

\underline{V}_2 labels a subclass of \underline{V} whose members combine with affixes 54, 111, 131, and 141 (examples: tr \underline{V}_2 sp dó·má to copulate; intr \underline{V}_2 sp bí·tá to excrete). Of the affixes combining with members of \underline{V}_2 , 54 is divisive for that subclass.

\underline{V}_3 labels a subclass of \underline{V} whose members combine with affixes 111, 131, and 141 (examples: intr \underline{V}_3 spp hímá ~ hímí- to go, walk; tr \underline{V}_3 spp wákoná to wash; intr \underline{V}_3 sp číkápaná to work).

Subclasses attested by virtue of association with one or more of the affixes 30, 40, 51, and 150 are listed below.

intr(ánsitive) \underline{V} labels a subclass of \underline{V} whose members combine with one or the other or both of the suffixes 150 imperative singular, plural and are incompatible with prefixes 30, 40. Those members of intr \underline{V} which combine with 151 imperative singular and are incompatible with 152 imperative plural and 51 plural are labeled intr \underline{V} s(ingular) (examples: intr \underline{V}_{1a} s dá[?]a ~ dá[?]i- to jump, fly, single actor; intr \underline{V}_{1b} s mú·ki to die, single actor). Members of intr \underline{V} which may combine with 152 imperative plural and are incompatible with affixes 151 imperative singular and 51 plural are labeled intr \underline{V} p(lural) (examples: intr \underline{V}_{1a} p ná[?]i to fly, plural actor; intr \underline{V}_{1a} p kó[?]i to die, plural actor). Members of intr \underline{V} which may combine with either of the suffixes 150 and are incompatible with 51 are labeled intr \underline{V} sp (examples: intr \underline{V}_{1a} sp gí[?]i to get fat; intr \underline{V}_2 sp bí·tá to excrete). Members of intr \underline{V} which may combine with both suffixes 150 and with 51 are labeled intr \underline{V} spp (examples: intr \underline{V}_3 spp hímá ~ hímí-

to go, walk; intr V_{1b}spp kó·sɪ̄~kó·si- to sleep).

tr(ansitive) V labels a subclass of V whose members combine with some or all of the prefixes 30, 40 and with the suffixes 150. Those members of tr V which may combine with 31 non-1 reflexive, 41 1 sg. goal, and 42 2 sg. goal and are incompatible with 32 3 pl. goal, 43 1 pl. goal, 44 2 pl. goal, and 51 plural are labeled tr V s (examples: tr V_{3s} múlinɪ̄ to break, single goal; tr V_{1as} múʔa to kill, single goal; tr V_{1as} báhi to take, single goal). Those members of tr V which may combine with prefixes 30, 43, 44 and are incompatible with prefixes 41, 42 are labeled tr V p (examples: tr V_{1ap} ʔuʔa to take, plural goal; tr V_{3p} nɪ̄·nɪ̄čudɪ̄ to cause to fly, plural goal). Members of tr V which may combine with any of the prefixes 30, 40 and are incompatible with 51 are labeled tr V sp (examples: tr V_{3sp} nɪ̄dɪ̄ to see; tr V_{3sp} wáidɪ̄ to invite; tr V_{1asp} báʔa ~ báʔi- to swallow, eat; tr V_{2sp} dó·mɪ̄ to copulate). Those members of tr V which may combine with prefixes 30, 40, and with 51 are labeled tr V spp (examples: tr V_{1b}spp wú·dɪ̄ to rope, tie; tr V₃spp kó·sidɪ̄ to cause to sleep, put to sleep).

double tr V labels a subclass of V whose members may combine with any of the prefixes 30, 40, and with the prefix sequence 32 - 40. Members of double tr V which are incompatible with 51 are labeled double tr V sp (examples: double tr V_{1b}sp má·kɪ̄ to give; double tr V₃sp máɪ̄čamɪ̄ to teach). Members of double tr V which may combine with 51 are labeled double tr V spp (example: double tr V₃spp wákonidɪ̄ to wash for

someone).

There are, in addition, two restricted subclasses of V whose members have a very limited distribution in terms of combination with affixes.

stative V labels a subclass of V whose members combine with affixes 131 and 141 (example: stative V s ká'ka- to stand, sg. actor). Certain members of stative V may combine with 51 plural; those stative V which may so combine are labeled stative V spp; those which are incompatible with 51 plural are labeled stative V s, stative V p, or stative V sp (subclasses attested on the basis of their co-occurrence with members of P(ronoun); see 4.1.).

att(ribute) V labels a subclass whose members combine with 131. Certain members of att V may combine with one or the other of the affixes 51 plural, 52 distributive. Those members of att V which may combine with 51 are labeled att V sp (examples: att V sp móika· to become soft; att V sp káwika· to become hard). Those members of att V which may combine with 52 are labeled att V sd (examples: att V sd šáwađika· to become thick, as rope; att V sd sópolika· to become short). Those members of att V which are incompatible with affixes 51, 52 are labeled att V s (examples: att V s tóni· to become hot; att V s ?í?owi· to become sweet). Of the affixes combining with members of att V, 131 is the only one with which all members of att V may combine.

In the following subsections, we treat and exemplify the co-occurrence of affixes in combination with members of

the various subclasses of V. Subsection 3.1.1. treats the co-occurrence of affixes 53, 54, 111, 121, 131, and 141 in combination with members of subclasses V₁, V₂, and V₃. Subsection 3.1.2. treats the co-occurrence of affixes 30, 40, 51, and 150 in combination with members of subclasses intr V, tr V, and double tr V. Subsection 3.1.3. is concerned with a synthesis of the two cross-cutting classifications; that is, we treat the co-occurrence of the set of affixes 53, 54, 111, 121, 131, 141 with members of the set 30, 40, 51, 150 and the combination of members of both of these sets of affixes with members of V. Subsection 3.1.4. treats sequences in which members of V combine with affixes 11, 30, 52, 160, and 140. Subsection 3.1.5. treats the restricted subclasses att V and stative V.

3.1.1. This subsection is concerned with sequences in which members of subclasses V₁, V₂, and V₃, in that order, combine with affixes.

Affixes with which all members of V₁ may combine are 53 (reduplicative) continuative, 111 (cancellation) non-present, 131 -ahimá ~ -himá progressive, and 141 -dA durative. Association with 53 is divisive for V₁.

In addition, certain members of V₁ (V_{1a}) may combine with the suffix 121 -ʔi hortative, while other members of V₁ (V_{1b}) are incompatible with 121. (an aside concerning canonical shapes of certain members of V: most members of V_{1a} share the interphonemic specification CVC^6V ; most members of V_{1b} share the interphonemic specification $C^{non-6}V^6C^{non-6}V$. Ex-

amples: \underline{V}_{1a} hí[?]a to urinate, bá[?]a to swallow, wí[?]i to remain, bíhi to take a single object, máhi to burn, ʔáhi to complete a cycle, kó[?]i to die, plural actor: \underline{V}_{1b} sá[?]dí to herd, mú[?]ki to die, wó[?]dí to lay, dá[?]sí to put a bulky object, čí[?]ki to put a sheet-like object, wú[?]dí to rope, tie, má[?]čí to know, má[?]ki to give).

The co-occurrence of affixes 53, 111, 121, 131 and 141 in combination with members of \underline{V}_1 is stated immediately below.

Affix 53 is incompatible with 111 and 121; it co-occurs with 131 and 141. Affixes 111 and 121 are incompatible with 53, 131, 141, and with each other. Suffixes 131, 141 are incompatible with each other and with 111, 121; they may co-occur with 53.

Sequences in which members of \underline{V}_1 combine with the above listed affixes are listed in formulae below. Each formula is accompanied by several examples in evidence, and each example is supplied with a translation and parenthetic morphemic break-down. Obligatory items in a given formula are preceded by a plus (+); items which may or may not be present in a given sequence represented by a formula are preceded by a plus-minus (±); mutually exclusive items are separated by a comma (,). Those examples which constitute complete and frequently occurring utterances are followed by /#/ . Most of the examples immediately following represent words which are uttered in isolation only if specifically requested; examples of this type are not accompanied by junctures.

Of the following formulae, (1, 2) represent frames in which all members of V_1 may combine; of these, (1) represents a frame which is exclusively associated with V_1 . Frame (3) is diagnostic of subclass V_{1a} and is exclusively associated therewith.

(1) $\pm 53 + V_1 \pm 131, 141$:

$ʔuʔa$ to take plural objects (tr $V_{1a}p$); $ʔuʔu$ to take plural objects, continuative ($53 + \text{tr } V_{1a}p$); $ʔuʔu \cdot himi$ to take plural objects, cont., progressive ($53 + \text{tr } V_{1a}p + 131$); $ʔuʔu \cdot di$ to take plural objects, cont., durative ($53 + \text{tr } V_{1a}p + 141$); $ʔuʔahimi$ to take plural objects, prog. (tr $V_{1a}p$ + 131); $ʔuʔadi$ to take plural objects, dur. (tr $V_{1a}p$ + 141).

$gaʔi$ to roast (tr $V_{1a}sp$); $gaʔi$ to roast, cont. ($53 + \text{tr } V_{1a}sp$); $gaʔi \cdot himi$ to roast, cont., prog. ($53 + \text{tr } V_{1a}sp + 131$); $gaʔi \cdot di$ to roast, cont., dur. ($53 + \text{tr } V_{1a}sp + 141$); $gaʔihimi$ to roast, prog. (tr $V_{1a}sp$ + 131); $gaʔadi$ to roast, dur. (tr $V_{1a}sp$ + 141).

$wiʔi$ to stay (intr $V_{1a}sp$); $wipi$ to stay, cont. ($53 + \text{intr } V_{1a}sp$); $wipi \cdot himi$ to stay, cont., prog. ($53 + \text{intr } V_{1a}sp + 131$); $wipi \cdot di$ to stay, cont., dur. ($53 + \text{intr } V_{1a}sp + 141$); $wiʔihimi$ to stay, prog. (intr $V_{1a}sp$ + 131); $wiʔidi$ to stay, dur. (intr $V_{1a}sp$ + 141).

$koʔi$ to die, pl. actor (intr $V_{1a}p$); $koʔo$ to die, be sick, pl. actor, cont. ($53 + \text{intr } V_{1a}p$); $koʔo \cdot himi$ to die, be sick, pl. actor, cont., prog. ($53 + \text{intr } V_{1a}p + 131$); $koʔo \cdot di$ to die, pl. dur. ($53 + \text{intr } V_{1a}p + 141$); $koʔihimi$

to die, pl., prog. (intr V_{1a}p + 131); kó²odá to die, pl. dur. (intr V_{1a}p + 141).

máhi to burn (intr V_{1a}sp); mámhí^o to burn, cont.
(53 + intr V_{1a}sp); mámhí^ohimí to burn, cont., prog. (53 + intr V_{1a}sp + 131); mámhí^odí to burn, cont., dur. (53 + intr V_{1a}sp + 141); máihimí to burn, prog. (intr V_{1a}sp + 131); míhdí to burn, dur. (intr V_{1a}sp + 141).

sá·dí to herd (tr V_{1b}sp); sásida^o to herd, cont.;
sásida·himí to herd, cont., prog. (53 + tr V_{1b}sp + 131);
sásida·dí to herd, cont., dur.; sá·dahimí to herd, prog.
(tr V_{1b}sp + 131); sá·dadí to herd, dur. (tr V_{1b}sp + 141).

wó·dí to lay (tr V_{1b}spp); wópida^o to lay, cont.
(53 + tr V_{1b}spp); wópida·himí to lay, cont., prog. (53 + tr V_{1b}spp + 131); wópida·dí to lay, cont., dur. (53 + tr V_{1b}spp + 141); wó·dahimí to lay, prog. (tr V_{1b}spp + 131); wó·dadí to lay, dur. (tr V_{1b}spp + 141).

má·kí to give (double tr V_{1b}spp); mánika^o to give,
cont. (53 + double tr V_{1b}sp); mámika·himí to give, cont.,
prog. (53 + double tr V_{1b}sp + 131); mámika·dí to give,
cont., dur. (53 + double tr V_{1b}sp + 141); má·kahimí to
give, prog. (double tr V_{1b}sp + 131); má·kadí to give, dur.
(double tr V_{1b}sp + 141).

mú·kí to die, single actor (intr V_{1b}s); múmiku^o
to die, be sick cont. (53 + intr V_{1b}s); múmiku·himí to die
be sick, sg. cont., prog. (53 + intr V_{1b}s + 131); múmiku·dí
to be sick, cont., dur. (53 + intr V_{1b}s + 141); mú·kihimí
to die, prog. (intr V_{1b}s + 131).

(2) $V_1 + 111$:

ʔúʔa to take pl. objects (tr V_{1ap}); ʔúí to take pl. objects, non-present (tr $V_{1as} + 111$);

báhi to take a single object (tr V_{1as}); báí to take a single object, non-present (tr $V_{1as} + 111$).

máhi to burn (intr V_{1asp}); máí to burn, non-pres. (intr $V_{1asp} + 111$).

báʔa to swallow (tr V_{1asp}); báʔ to swallow, non-pres. (tr $V_{1asp} + 111$).

ʔáhi to complete a cycle, overtake (tr V_{1asp}); ʔái to overtake, non-pres. (tr $V_{1asp} + 111$).

gáʔi to roast (tr V_{1asp}); gáí to roast, non-pres. (tr $V_{1asp} + 111$).

ʔíʔi to drink (tr V_{1asp}); ʔíʔ to drink, non-present (tr $V_{1asp} + 111$).

gíʔi to get fat (intr V_{1asp}); gíʔ to get fat, non-pres. (intr $V_{1asp} + 111$).

sá·dǎ to herd (tr V_{1bsp}); sái to herd, non-present (tr $V_{1bsp} + 111$).

mú·ki to die; sgi (intr V_{1bs}); mú· to die, sg. non-pres. (intr $V_{1bs} + 111$).

ná·dǎ to kindle (tr V_{1bsp}); náí to kindle, non-pres. (tr $V_{1bsp} + 111$).

má·čǎ to know, pres. (tr V_{1bsp}); máí to know, non-pres. (tr $V_{1bsp} + 111$).

wú·dǎ to rope, tie (tr V_{1bsp}); wú· to rope, tie, non-pres. (tr $V_{1bsp} + 111$).

$\check{v}_3^{\acute{i}}$ ki to taste (tr $V_{1b}sp$); $\check{v}_3^{\acute{i}}$ to taste, non-pres.
(tr $V_{1b}sp$ + 111).

dá's \check{s} to put a bulky object (tr $V_{1b}sp$); dáí to put,
non-pres. (tr $V_{1b}sp$ + 111).

(3) V_{1a} + 121:

$\check{u}^?a$ to take pl. objects (tr $V_{1a}p$); $\check{u}^?i$ to take
pl. objects, hortative (tr $V_{1a}p$ + 121).

gá \check{r} i to roast (tr $V_{1a}sp$); gá \check{r} i to roast, hortative
(tr $V_{1a}sp$ + 121).

kí \check{r} i to bite (tr $V_{1a}sp$); k \acute{i} \check{r} i to bite, hortative
(tr $V_{1a}sp$ + 121).

$\check{a}hi$ to complete a cycle, overtake (tr $V_{1a}sp$);
 $\check{a}^?i$ to overtake, hortative (tr $V_{1a}sp$ + 121).

b $\acute{a}hi$ to take a single object (tr V_{1as}); b $\acute{a}^?i$ to
take a single object, hortative. (tr V_{1as} + 121).

$\check{i}^?i$ to drink (tr $V_{1a}sp$); $\check{i}^?i$ to drink, hortative
(tr $V_{1a}sp$ + 121).

kó \check{r} i to die, pl. actor (intr $V_{1a}p$); kó \check{r} i to die, pl.,
hortative (intr $V_{1a}p$ + 121).

wí \check{r} i to stay (intr $V_{1a}sp$); wí \check{r} i to stay, hortative
(intr $V_{1a}sp$ + 121).

mú \check{r} to wound (tr $V_{1a}sp$); mú \check{r} i to wound, hortative
(tr $V_{1a}sp$ + 121).

gí \check{r} a to string (tr $V_{1a}sp$); g \acute{a} \check{r} i to string, hortative
(tr $V_{1a}sp$ + 121).

Sequences in which members of V_2 combine with affixes
are treated in the following paragraphs. Subclass V_2 is quite

small in terms of number of members (most members of \underline{V}_2 share a common interphonemic specification of the type $C^{\text{non-6}\check{V}\cdot C - \text{non-6}\check{V}}$).

Affixes with which members of \underline{V}_2 may combine are 54 momentaneous, 111 non-present, 131 progressive, and 141 durative. Of these affixes, 54 is divisive for \underline{V}_2 .

The co-occurrence of the affixes 54, 111, 131, and 141 in combination with members of \underline{V}_2 is as follows. Affix 54 is incompatible with 131; it may co-occur with 111 and 141. In combination with members of \underline{V}_2 , 111 obligatorily co-occurs with 54 (though 54 may or may not co-occur with 111); 111 is incompatible with 131 and 141. Suffix 131 is incompatible with 54, 111, and with 141. Suffix 141 may co-occur with 54 and is incompatible with 111 and 131. (A word about the meaning of 54: in sequence with 111 or 141, the meaning momentaneous of 54 is apparently lost. No difference in meaning has been found between sequences of the type 54 + \underline{V}_2 + 141 and \underline{V}_2 + 141; both of these sequences mean to verb, durative).

Sequences in which members of \underline{V}_2 combine with the affixes listed above are given in formulae below. Of these formulae, (2) represents a frame which is exclusively associated with \underline{V}_2 .

(1) $\underline{V}_2 \pm$ 131, 141:

$\check{z}^{\check{a}}\cdot n^{\check{a}} \underline{\text{to smoke}}$ (tr $\underline{V}_2\text{sp}$); $\check{z}^{\check{a}}\cdot n^{\check{a}}\text{himi} \underline{\text{to smoke, prog.}}$
(tr $\underline{V}_2\text{sp} + 131$); $\check{z}^{\check{a}}\cdot n^{\check{a}}\text{id} \underline{\text{to smoke, durative}}$ (tr $\underline{V}_2\text{sp} + 141$).

$w^{\check{o}}\cdot n^{\check{a}} \underline{\text{to pluck}}$ (tr $\underline{V}_2\text{sp}$); $w^{\check{o}}\cdot n^{\check{a}}\text{himi} \underline{\text{to pluck, prog.}}$
(tr $\underline{V}_2\text{sp} + 131$); $w^{\check{o}}\cdot n^{\check{a}}\text{id} \underline{\text{to pluck, dur.}}$ (tr $\underline{V}_2\text{sp} + 141$).

kú'má to gnaw, eat (tr V_{2sp}); kú'mahimá to gnaw, prog. (tr V_{2sp} + 131); kú'madá to gnaw, dur. (tr V_{2sp} + 141).

wí'pá to suck (as of mesquite beans) (tr V_{2sp}); wí'páhimá to suck prog. (tr V_{2sp} + 131); wí'páadá to suck, dur. (tr V_{2sp} + 141).

bí'tá to excrete (intr V_{2sp}); bí'táhimá to excrete, prog. (intr V_{2sp} + 131).

dó'má to copulate (tr V_{2sp}); dó'mahimá to copulate, prog. (tr V_{2sp} + 131); dó'madá to copulate, dur. (tr V_{2sp} + 141).

(2) + 54 + V₂ + 111, 141:

ǎ'ǎ'íná to smoke, momentaneous (54 + tr V_{2sp}); ǎ'ǎ'á to smoke, non-pres. (54 + tr V_{2sp} + 111); ǎ'ǎ'nadá to smoke, dur. (54 + tr V_{2sp} + 141).

wó'poná to pluck, mom. (54 + tr V_{2sp}); wó'pá to pluck, non-pres. (54 + tr V_{2sp} + 111); wó'pánadá to pluck, dur. (54 + tr V_{2sp} + 141).

wí'piná to suck, mom. (54 + tr V_{2sp}); wí'pá to suck, non-pres. (54 + tr V_{2sp} + 111); wí'pinadá to suck, dur. (54 + tr V_{2sp} + 141).

kú'kumá to gnaw, eat, mom. (54 + tr V_{2sp}); kú'ká to gnaw, non-pres. (54 + tr V_{2sp} + 111); kú'kumadá to gnaw, dur. (54 + tr V_{2sp} + 141).

bí'bítá to excrete, mom. (54 + intr V_{2sp}); bí'bá to excrete, non-pres. (54 + intr V_{2sp} + 111); bí'bítadá to excrete, dur. (54 + intr V_{2sp} + 141).

dó·domi to copulate, mom. (54 + tr V_{2sp}); dó·di
to copulate, non-pres. (54 + tr V_{2sp} + 111).

či·čigi to name, mom. (54 + tr V_{2sp}); či·či to
name, non-pres. (54 + tr V_{2sp} + 111).

gi·gawi to strike, mom. (54 + tr V_{2sp}); gi·gi to
strike, non-pres. (54 + tr V_{2sp} + 111).

Sequences in which members of V₃ combine with affixes
are treated in the following paragraphs. Subclass V₃ repre-
sents the most productive verb subclass in terms of number of
members.

Affixes with which members of V₃ combine are 111 non-
present, 131 progressive, and 141 durative. In sequence with
members of V₃, affixes 111, 131, and 141 are mutually incom-
patible.

Sequences in which members of V₃ combine with affixes
111, 131, and 141 are included in the single formula (1) below.

(1) V₃ ± 111, 131, 141:

níoki to speak (intr V_{3spp}); nío to speak, non-pres.
(intr V_{3spp} + 111); níokahimí to speak, prog. (intr V_{3spp} +
131); níokadi to speak, dur. (intr V_{3spp} + 141).

číkípani to work (intr V_{3sp}); číkípi to work, non-
pres. (intr V_{3sp} + 111); číkípanahimí to work, prog. (intr
V_{3sp} + 131); číkípanadi to work, dur. (intr V_{3sp} + 141).

hí·ki to cut grass, hair, to mow (tr V_{3sp}); hí· to
cut, non-pres. (tr V_{3sp} + 111); hí·kahimí to cut prog.
(tr V_{3sp} + 131); hí·kadí to cut, dur. (tr V_{3sp} + 141).

síkoní to hoe (tr V_{3sp}); síko· to hoe, non-pres.

(tr V_{3sp} + 111); síkonahimǎ to hoe prog. (tr V_{3sp} + 131);
síkonadǎ to hoe, dur. (tr V_{3sp} + 141).

húdupǎ to descend (intr V_{3sp}); húdǎ to descend, non-
pres. (intr V_{3sp} + 111); húdupǎhimǎ to descend, prog. (intr
V_{3sp} + 131).

hímǎ to go, walk (intr V_{3spp}); hí• to go, non-pres.
 (intr V_{3spp} + 111); hímahimǎ to go, prog. (intr V_{3spp} + 131);
hímadǎ to go, dur. (intr V_{3spp} + 141).

wá[?]učǎ to wet (tr V_{3sp}); wá[?]u to wet, non-pres.
 (tr V_{3sp} + 111); wá[?]učǎhimǎ to wet prog. (tr V_{3sp} + 131);
wá[?]učidǎ to wet, dur. (tr V_{3sp} + 141).

másǎčamǎ to teach (tr V_{3sp}); másǎča• to teach, non-
pres. (tr V_{3sp} + 111); másǎčamahimǎ to teach, prog. (tr
V_{3sp} + 131); másǎčamadǎ to teach, dur. (tr V_{3sp} + 141).

ʔúanǎ to erase, wipe off (tr V_{3sp}); ʔúa to erase,
non-pres. (tr V_{3sp} + 111); ʔúanahimǎ to erase, prog.
 (tr V_{3sp} + 131); ʔúanadǎ to erase, dur. (tr V_{3sp} + 141).

hǎhǎmǎ to laugh (intr V_{3sp}); hǎhǎ to laugh, non-
pres. (intr V_{3sp} + 111); hǎhǎmǎhimǎ to laugh, prog.
 (intr V_{3sp} + 131); hǎhǎmidǎ to laugh, dur. (intr V_{3sp} + 141).

čǎkidǎ to vaccinate (tr V_{3sp}); čǎki to vaccinate,
non-pres. (tr V_{3sp} + 111); čǎkidahimǎ to vaccinate, prog.
 (tr V_{3sp} + 131); čǎkidadǎ to vaccinate, dur. (tr V_{3sp} + 141).

wíduǎ to swing (tr V_{3spp}); wídu• to swing, non-
pres. (tr V_{3spp} + 111); wíduǎhimǎ to swing, prog. (tr V_{3spp}
+ 131); wíduǎdǎ to swing, dur. (tr V_{3spp} + 141).

wá[?]igǎ to get water, carry water (tr V_{3sp}); wá[?]i
to get water, non-pres. (tr V_{3sp} + 111); wá[?]igahimǎ to get

water, prog. (tr V_{3sp} + 131); wá'igadĩ to get water, dur.
(tr V_{3sp} + 141).

ǔ'pĩ to do, make (tr V_{3sp}); ǔ' to do, non-pres.
(tr V_{3sp} + 111); ǔ'pĩhimi to do, prog. (tr V_{3sp} + 131).

3.1.2. The present subsection treats sequences in which members of subclasses intr V, tr V, and double tr V, in that order, occur in combination with affixes 30, 40, 51, and 150.

Members of intr V may combine with one or more or all of the affixes 51 (reduplicative) plural, 151 -pĩ imperative singular, 152 -wo'~ -yo'~ -o'~ -io imperative plural. According to their combination with these affixes, members of intr V fall into four subclasses: intr V s, intr V p, intr V sp, and intr V spp.

Members of intr V s combine with 151 imperative singular and are incompatible with 152 imperative plural and with 51 plural. Sequences in which members of intr V s combine are included in the formula (1) below.

(1) intr V s + 151:

má'dĩ to run, single actor (intr V_{1bs}); má'danĩ #
You (sg.) run ! (intr V_{1bs} + 151).

dá'a to fly, jump, sg. actor (intr V_{1as}); dá'ini #
You (sg.) fly ! (intr V_{1as} + 151).

mú'ki to die, sg. actor (intr V_{1bs}); mú'kinĩ #
You (sg.) die ! (intr V_{1bs} + 151).

kíkiwa° to stand, stop, single actor (intr V_{1bs});
kíkiwa°pĩ # You (sg.) stand up, stop ! (intr V_{1bs} + 151).

Members of intr V p combine with 152 imperative plural and are incompatible with 151 imperative singular and with 51 plural. Sequences in which members of intr V p combine are included in the formula (1) below.

(1) intr V p + 152:

wó·poʔi to run, pl. actor (intr V_{1ap}); wó·poʔiyo·#
You (pl.) run! (intr V_{1ap} + 152).

náʔi to fly, jump, pl. actor (intr V_{1ap}); náʔiwo·#
You (pl.) fly! (intr V_{1ap} + 152).

kóʔi to die, pl. actor (intr V_{1ap}); kóʔiwo·# You
(pl.) die ! (intr V_{1ap} + 152).

gʔgokiwa· to stand, stop, pl. actor (intr V_{1bp});
gʔgokiwiyo· You (pl.) stand, stop ! (intr V_{1bp} + 152).

Members of intr V sp combine with both suffixes 150 and are incompatible with 51 plural. Sequences in which members of intr V sp combine are included in the formula (1) below.

(1) intr V sp + 150:

gíʔi to get fat (intr V_{1asp}); gíʔiɲi# You (sg.)
get fat ! (intr V_{1asp} + 151); gíʔiwo·# You (pl.) get fat !
(intr V_{1asp} + 152).

náʔi to sing (intr V_{1asp}); náʔiɲi# You (sg.) sing!
(intr V_{1asp} + 151); náʔiwo·# You (pl.) sing ! (intr V_{1asp}
+ 152).

bí·tʔi to excrete (intr V_{2sp}); bí·bʔitani# You (sg.)
excrete ! (54 + intr V_{2sp} + 151); bí·bito·# You (pl.)
excrete ! (54 + intr V_{2sp} + 152).

čikápaná to work (intr V_{3sp}); čikápananá# You
(sg.) work ! (intr V_{3sp} + 151); čikápano•# You (pl.) work!
 (intr V_{3sp} + 152).

háhámá to laugh (intr V_{3sp}); háhámíná# You (sg.)
laugh ! (intr V_{3sp} + 151); háhimo•# You (pl.) laugh !
 (intr V_{3sp} + 152).

Members of intr V spp combine with both suffixes 150 imperative singular, plural and with 51 plural (marking plural actor in that combination). In combination with members of intr V spp, 152 imperative plural obligatorily co-occurs with 51 plural; obligatorily co-occurs with 51 plural; 151 imperative singular is incompatible with 51 in combination with intr V spp. Sequences in which members of intr V spp combine are listed in formulae (1,2) below.

(1) intr V spp + 151:

hímá to go, walk (intr V_{3spp}); hímíná# You (sg.) go!
 (intr V_{3spp} + 151).

kó•sá to sleep (intr V_{1b}spp); kó•síná# You (sg.)
sleep ! (intr V_{1b}spp + 151).

níoká to speak (intr V_{3spp}); níokíná ~ níokaná#
You (sg.) speak ! (intr V_{3spp} + 151).

wámigá to wake up (intr V_{3spp}); wámiginá You (sg.)
wake up ! (intr V_{3spp} + 151).

(2) + 51 + intr V spp + 152:

híhimá to go, walk, pl. actor (51 + intr V_{3spp});
híhimo•# You (pl.) go ! (51 + intr V_{3spp} + 152).

kó•kásá to sleep, pl. actor (51 + intr V_{1b}spp);

kó·kíso· You (pl.) sleep ! (51 + intr V_{1b}spp + 151).

ná·nokí to speak, pl. actor (51 + intr V₃spp);

ná·noko·# You (pl.) speak ! (51 + intr V₃spp + 152).

wá·pamigi to wake up, pl. actor (51 + intr V₃spp);

wá·panigio You (pl.) wake up ! (51 + intr V₃spp + 152).

Sequences in which members of tr V combine with affixes are treated below. Members of tr V may combine with some or all of the following affixes: 31 [?]4- non-1 reflexive, suus; 32 ha- 3 plural goal, possessor; 41 ná- 1 sg. goal, possessor; 42 má- 2 sg. goal, possessor; 43 tí- 1 pl. goal, possessor; 44 [?]ímí 2 pl. goal, possessor; 51 (reduplicative) plural (marking plural goal in combination with tr V); and 150 imperative singular, plural. According to their combination with these affixes, members of tr V fall into four subclasses: tr V s, tr V p, tr V sp, and tr V spp. Each of these subclasses of tr V is treated below.

Members of tr V s combine with prefixes 31 non-1 reflexive, 41 1 sg. goal, and 42 2 sg. goal and are incompatible with 32 3 pl. goal, 43 1 pl. goal, 44 2 pl. goal, and with 51 plural. Members of tr V s may combine with both suffixes 150 imperative sg. pl.. In combination with tr V s, 151 imperative sg. may co-occur with 31 and 41 and is incompatible with 42. 152 imperative pl. may co-occur with 41 and is incompatible with 31 in combination with tr V s.

Sequences in which members of tr V s combine are listed in formulae (1, 2, 3) below.

(1) ± 31, 41, 42 + tr V s:

bíhi to take a single object (tr V_{1a}s); ?íbíhi
to take oneself (non-first person), to get caught (31 +
tr V_{1a}s); níbíhi to take, catch me (41 + tr V_{1a}s); míbíhi
to take, catch you (42 + tr V_{1a}s).

mílicudí to cause a single object to run, to start, as
of car (tr V₃s); ?ímálicudí to cause oneself to run, to run
away (31 + tr V₃s); nímálicudí to cause me, myself to run
(41 + tr V₃s); mámálicudí to cause you to run, to race with
you (42 + tr V₃s).

(2) + 31, 41 + tr V s + 151:

bíhijí# You (sg.) catch (it) ! (tr V_{1a}s + 151);
?íbíhijí# You (sg.) catch yourself, pick yourself up ! (31 +
tr V_{1a}s + 151);

(3) + 41 + tr V s + 152:

bíhiwo# You (pl.) take, catch (it) ! (tr V_{1a}s);
níbíhiwo# You (pl.) take, catch me ! (41 + tr V_{1a}s + 152).
mú[?]awo# You (pl.) kill (it) ! (tr V_{1a}s + 152);
nímú[?]awo# You (pl.) kill me ! (41 + tr V_{1a}s + 152).

Members of tr V p combine with prefixes 31 non-1 reflexive, 32 3 pl. goal, 43 1 pl. goal, and 44 2 pl. goal and are incompatible with 41 1 sg. goal and 42 2 sg. goal, and with 51 plural. Members of tr V p may combine with both suffixes 150 imperative sg., pl.. In combination with tr V p, 151 imperative sg. may co-occur with 32 and 43 and is incompatible with 31 and 44; 152 imperative pl. may co-occur with 30 and 43 and is incompatible with 44 in combination with members of tr V p.

Sequences in which members of tr V p combine with affixes are given in formulae (1, 2, 3) below.

(1) $\pm 30, 43, 44 + \text{tr V p}$:

$ʔʊʔa$ to take plural objects (tr V_{1aP}); $haʔʊʔa$ to take them ($32 + \text{tr V}_{1aP}$); $ʔiʔʊʔa$ to take oneself, get caught (non-first person) ($31 + \text{tr V}_{1aP}$); $tʔiʔʊʔa$ to take us ($43 + \text{tr V}_{1aP}$); $ʔimʔiʔʊʔa$ to take you (pl.) ($44 + \text{tr V}_{1aP}$).

(2) $\pm 32, 43 + \text{tr V p} + 151$:

$ʔʊʔipʔi\#$ You (sg.) take (them) ! (tr V_{1aP} + 151);
 $haʔʊʔipʔi\#$ You (sg.) take them ! ($32 + \text{tr V}_{1aP} + 151$);
 $tʔiʔʊʔipʔi\#$ You (sg.) take us ! ($43 + \text{tr V}_{1aP} + 151$).

(3) $\pm 30, 43 + \text{tr V p} + 152$:

$ʔʊʔiwo\#\#$ You (pl.) take (them) ! (tr V_{1aP} + 152);
 $haʔʊʔiwo\#\#$ You (pl.) take them ! ($32 + \text{tr V}_{1aP} + 152$);
 $tʔiʔʊʔiwo\#\#$ You (pl.) take us ! ($43 + \text{tr V}_{1aP} + 152$).
 $wó\#poʔiçudo\#\#$ You (pl.) cause (them) to run !
 (tr V_{3P} + 152); $ʔiwo\#poʔiçudo\#\#$ You (pl.) take off !
 ($31 + \text{tr V}_{3P} + 152$).

Members of tr V sp may combine with prefixes 31 non-1 reflexive, 32 3 pl. goal, 41 1 sg. goal, 42 2 sg. goal, 43 1 pl. goal, and 44 2 pl. goal and are incompatible with 51 plural. Members of tr V sp may combine with both suffixes 150 imperative sg., pl.. In combination with members of tr V sp, suffixes 150 imperative sg., pl. may co-occur with prefixes 30, 41, and 43, and are incompatible with prefixes 42 and 44.

Sequences in which members of tr V sp combine with

affixes are given in formulae (1,2) below.

(1) $\pm 30, 40 + \text{tr } V \text{ sp}$:

$n\acute{a}id\acute{i}$ to see ($\text{tr } V_3\text{sp}$); $^?n\acute{a}id\acute{i}$ to see oneself
(non-first person) ($31 + \text{tr } V_3\text{sp}$); $han\acute{a}id\acute{i}$ to see them
($32 + \text{tr } V_3\text{sp}$); $n\acute{n}\acute{a}id\acute{i}$ to see me ($41 + \text{tr } V_3\text{sp}$); $m\acute{n}\acute{a}id\acute{i}$
to see you (sg.) ($42 + \text{tr } V_3\text{sp}$); $t\acute{n}\acute{a}id\acute{i}$ to see us ($43 +$
 $\text{tr } V_3\text{sp}$); $^?im\acute{n}\acute{a}id\acute{i}$ to see you (pl.) ($44 + \text{tr } V_3\text{sp}$).

$k\acute{i}^?i$ to bite ($\text{tr } V_{1a}\text{sp}$); $^?ik\acute{i}^?i$ to bite oneself,
get bit (non-first person) ($31 + \text{tr } V_{1a}\text{sp}$); $hak\acute{i}^?i$ to bite
them ($32 - \text{tr } V_{1a}\text{sp}$); $n\acute{a}k\acute{i}^?i$ to bite me ($41 + \text{tr } V_{1a}\text{sp}$);
 $m\acute{a}k\acute{i}^?i$ to bite you (sg.) ($42 + \text{tr } V_{1a}\text{sp}$); $t\acute{a}k\acute{i}^?i$ to bite
us ($43 + \text{tr } V_{1a}\text{sp}$); $^?im\acute{a}k\acute{i}^?i$ to bite you (pl.) ($44 +$
 $\text{tr } V_{1a}\text{sp}$).

$d\acute{o}\cdot m\acute{i}$ to copulate, cohabit ($\text{tr } V_2\text{sp}$); $had\acute{o}\cdot m\acute{i}$ to
have intercourse with them ($32 + \text{tr } V_2\text{sp}$); $m\acute{id}\acute{o}\cdot m\acute{i}$ to have
intercourse with you (sg.) ($42 + \text{tr } V_2\text{sp}$); $t\acute{id}\acute{o}\cdot m\acute{i}$ to have
intercourse with us ($43 + \text{tr } V_2\text{sp}$).

(2) $\pm 30, 41, 43 + \text{tr } V \text{ sp} + 150$:

$n\acute{a}idan\acute{i}\#$ You (sg.) look at (it) ! ($\text{tr } V_3\text{sp} + 151$);
 $n\acute{a}ido\cdot\#$ You (pl.) look (at it) ! ($\text{tr } V_3\text{sp} + 152$); $^?n\acute{a}idan\acute{i}\#$
You (sg.) look at yourself ! ($31 + \text{tr } V_3\text{sp} + 151$); $^?n\acute{a}ido\cdot\#$
You (pl.) look at yourselves ! ($31 + \text{tr } V_3\text{sp} + 152$);
 $han\acute{a}idan\acute{i}\#$ You (sg.) look at them ($32 + \text{tr } V_3\text{sp} + 151$);
 $han\acute{a}ido\cdot\#$ You (pl.) look at them ($32 + \text{tr } V_3\text{sp} + 152$);
 $n\acute{n}\acute{a}idan\acute{i}\#$ You (sg.) look at me ! ($41 + \text{tr } V_3\text{sp} + 151$);
 $n\acute{n}\acute{a}ido\cdot\#$ You (pl.) look at me ! ($41 + \text{tr } V_3\text{sp} + 152$);
 $t\acute{n}\acute{a}idan\acute{i}\#$ You (sg.) look at us ! ($43 + \text{tr } V_3\text{sp} + 151$);

tápnáido·# You (pl.) look at us ! (43 + tr V₃sp + 152).

ká'ípná# You (sg.) bite (it) ! (tr V_{1a}sp + 151);

ká'íwo·# You (pl.) bite (it) ! (tr V_{1a}sp + 152); náká'ípná#

You (sg.) bite me ! (41 + tr V_{1a}sp + 151); háká'íwo·# You (pl.) bite them ! (32 + tr V_{1a}sp + 152).

Members of tr V spp may combine with prefixes 31 non-1 reflexive, 32 3 pl. goal, 41 1 sg. goal, 42 2 sg. goal, 43 1 pl. goal, 44 2 pl. goal and with 51 plural. In combination with members of tr V spp, prefixes 32, 43, and 44 obligatorily co-occur with 51; prefixes 41 and 42 are incompatible with 51 in that sequence, and 31 may or may not co-occur with 51 in that sequence.

Members of tr V spp may combine with both suffixes 150 imperative sg., pl.. In combination with members of tr V spp and in sequence with prefix 31, 152 imperative pl. obligatorily co-occurs with 51 plural; 151 imperative sg. is incompatible with 51 in that sequence. Suffixes 150 may co-occur with prefixes 30, 41, and 43 and are incompatible with prefixes 42 and 44.

Sequences in which members of tr V spp combine with affixes are given in formulae (1) through (6) below.

(1) + 31, 41, 42 + tr V spp:

wá'ídná to swing (tr V₃spp); 'íwá'ídná to swing one-self (non-first person) (31 + tr V₃spp); náwá'ídná to swing me, myself (41 + tr V₃spp); máwá'ídná to swing you (42 + tr V₃spp).

wákoná to wash, baptize (tr V₃spp); 'íwákoná to

wash oneself, get baptized (non-first person) (31 + tr V₃spp);

n̄iwakon̄i to wash, baptize me, myself (41 + tr V₃spp);

m̄iwakon̄i to wash, baptize you (42 + tr V₃spp).

(2) ± 30, 43, 44 + 51 + tr V spp:

wíp̄dut̄i to swing, pl. goal (51 + tr V₃spp);

?iwíp̄dut̄i to swing selves (non-first person) (31 + 51 +

tr V₃spp); hawíp̄dut̄i to swing them (43 + 51 + tr V₃spp);

t̄iwíp̄dut̄i to swing us, ourselves (43 + 51 + tr V₃spp);

?im̄iwíp̄dut̄i to swing you (pl.) (44 + 51 + tr V₃spp).

wáp̄ikon̄i to wash, pl. goal (51 + tr V₃spp);

?iwáp̄ikon̄i to wash selves (non-first person) (31 + 51 +

tr V₃spp); t̄iwáp̄ikon̄i to wash us, ourselves (43 + 51 +

tr V₃spp); ?im̄iwáp̄ikon̄i to wash you (pl.) (44 + 51 +

tr V₃spp).

(3) ± 31, 41 + tr V spp + 151:

wídut̄an̄i You (sg.) swing (him) ! (tr V₃spp + 151);

?iwídut̄an̄i# You (sg.) swing yourself ! (31 + tr V₃spp + 151);

n̄iwídut̄an̄i# You (sg.) swing me ! (41 + tr V₃spp + 151).

(4) ± 32, 43 + 51 + tr V spp + 151:

wíp̄dut̄an̄i# You (sg.) swing (them) ! (51 + tr V₃spp

+ 151); hawíp̄dut̄an̄i# You (sg.) swing them ! (32 + 51 +

tr V₃spp + 151); t̄iwíp̄dut̄an̄i# You (sg.) swing us ! (43 +

51 + tr V₃spp + 151).

(5) ± 41 + tr V spp + 152:

wíduto. You (pl.) swing (him) ! (tr V₃spp + 152);

n̄iwíduto. You (pl.) swing me ! (41 + tr V₃spp + 152).

(6) ± 30, 43 + 51 + tr V spp + 152:

wípiđuto° You (pl.) swing (them) ! (51 + tr V₃spp + 152); ?íwípiđuto°# You (pl.) swing yourselves ! (31 + 51 + tr V₃spp + 152); hawípiđuto° You (pl.) swing them ! (32 + 51 + tr V₃spp + 152); tíwípiđuto° You (pl.) swing us ! (43 + 51 + tr V₃spp + 152).

Sequences in which members of double tr V combine with affixes are treated below. Members of double tr V may combine with prefixes 31 non-1 reflexive, 32 3 pl. goal, 41 1 sg. goal, 42 2 sg. goal, 43 1 pl. goal, 44 2 pl. goal, and with the prefix sequence 32 + 40. Association with the prefix sequence 32 + 40 is divisive for double tr V. Certain members of double tr V may combine with 51 plural. All members of double tr V may combine with 150 imperative sg., pl.. According to their combination or incompatibility with 51 plural, members of double tr V fall into two subclasses: double tr V sp and double tr V spp.

Members of double tr V sp combine with prefixes 30, 40, and with the prefix sequence 32 + 40 and are incompatible with 51 plural. Members of double tr V sp may combine with both suffixes 150 imperative sg., pl.. In combination with members of double tr V sp, 150 may co-occur with prefixes 30, 41, 43 and are incompatible with the prefixes 42, 44, and with the prefix sequence 32 + 40.

(In combination with members of double tr V, prefixes 40 mark what has traditionally been called 'indirect object'. In the sequence 32 + 40 + double tr V, prefix 32 marks 'plural direct object'. In the sequence 30 + double tr V, prefixes

30 mark, ambiguously, 'direct object' or 'indirect object'.)

Sequences in which members of double tr V sp combine are listed in formulae (1, 2, 3) below.

(1) + 30, 40 + double tr V sp:

má·kĭ to give (double tr V_{1b}sp); ʔimá·kĭ to give to oneself (non-first person), (or ambiguously) to give self, to be given (31 + double tr V_{1b}sp); hamá·kĭ to give to them, (or ambiguously) to give them (32 + double tr V_{1b}sp); nĭmá·kĭ to give to me (41 + double tr V_{1b}sp); mĭmá·kĭ to give to you (42 + double tr V_{1b}sp); tĭmá·kĭ to give to us (43 + double tr V_{1b}sp); ʔimimá·ki to give to you (pl.) (44 + double tr V_{1b}sp).

másĭčamĭ to teach (double tr V₃sp); ʔimásĭčamĭ to teach oneself (non-first person) (31 + double tr V₃sp); hamásĭčamĭ to teach them, to teach some (32 + double tr V₃sp); nĭmásĭčamĭ to teach me (41 + double tr V₃sp); mĭmásĭčamĭ to teach you (42 + double tr V₃sp); tĭmásĭčamĭ to teach us (43 + double tr V₃sp); ʔimimásĭčamĭ to teach you (pl.) (44 + double tr V₃sp).

(2) + 32+40 + double tr V sp:

hanĭmá·kĭ to give them to me (32 + 41 + double tr V_{1b}sp); hamĭmá·kĭ to give them to you (32 + 42 + double tr V_{1b}sp); hatĭmá·kĭ to give them to us (32 + 43 double tr V_{1b}sp); haʔimĭmá·kĭ to give them to you (pl.) (32 + 44 + double tr V_{1b}sp).

hanĭmásĭčamĭ to teach me some (32 + 41 + double tr V₃sp); hamĭmásĭčamĭ to teach you some (32 + 42 + double tr V₃sp);

ha[?]imásičamī to teach us some (32 + 43 + double tr V_{3sp} †);
 ha[?]imásičamī to teach you (pl.) some (32 + 44 + double
tr V_{3sp}).

(3) † 30, 41, 43 + double tr V sp + 150:

má·kanī # You (sg.) give (it to him) ! (double tr
V_{1b}sp + 151); hamá·kanī # You (sg.) give them ! (32 + double
tr V_{1b}sp + 151); nímá·kanī # You (sg.) give (it, them) to me !
 (41 + double tr V_{1b}sp + 151).

másičamanī # You (sg.) teach (it) to (him, them) !
 (double tr V_{3sp} + 151); másičamo· # You (pl.) teach (it) to
(him, them) ! (double tr V_{3sp} + 152); [?]imásičamanī # You
(sg.) teach yourself ! (31 + double tr V_{3sp} + 151);
 hamásičamo· # You (pl.) teach them ! (32 + double tr V_{3sp} +
 152); nímásičamanī # You (sg.) teach me ! (41 + double tr
V_{3sp} + 151); tímásičamo· # You (pl.) teach us ! (43 + double
tr V_{3sp} + 152).

Members of double tr V spp combine with prefixes 30,
 40, with the prefix sequence 32 + 40, and with 51 plural.
 In combination with members of double tr V spp, the prefix
 sequence 32 + 40 obligatorily co-occurs with 51 plural.
 Members of double tr V spp may combine with suffixes 150
imperative sg. pl.; in combination with double tr V spp, 150
 may co-occur with 30, 41, 43, and 51 and are incompatible with
 42, 44 and with the prefix sequence 32 + 40. Sequences in
 which members of double tr V spp combine with the affixes
 listed above are given in formulae (1, 2, 3) below.

(1) † 30, 40 † 51 + double tr V spp:

wákonidǎ to wash something for some one (double tr V₃spp); wápakonidǎ to wash plural objects for some one (51 + double tr V₃spp); pa^hwákonidǎ to wash (it) for me (41 + double tr V₃spp); pa^hwápakonidǎ to wash (them) for me (41 + 51 + double tr V₃spp); ma^hwákonidǎ to wash (it) for you (sg.) (42 + double tr V₃spp); ma^hwápakonidǎ to wash (them) for you (sg.) (42 + 51 + double tr V₃spp); ti^hwákonidǎ to wash (it) for us (43 + double tr V₃spp); ti^hwápakonidǎ to wash (them) for us (43 + 51 + double tr V₃spp); ?imáwákonidǎ to wash (it) for you (pl.) (44 + double tr V₃spp); ?imáwápakonidǎ to wash (them) for you (pl.) (44 + 51 + double tr V₃spp); ?iwákonidǎ to wash (it) for oneself (non-first person) (31 + double tr V₃spp); ?iwápakonidǎ to wash (them) for oneself (31 + 51 + double tr V₃spp); hawápakonidǎ to wash them, to wash (them) for them (32 + 51 + double tr V₃spp).

(2) + 32+40 + 51 double tr V spp:

hanáwápakonidǎ to wash them for me (32 + 41 + 51 + double tr V₃spp); hamáwápakonidǎ to wash them for you (32 + 42 + 51 double tr V₃spp); hatáwápakonidǎ to wash them for us (32 + 43 + 51 + double tr V₃spp); ha^h?imáwápakonidǎ to wash them for you (pl.) (32 + 44 + 51 + double tr V₃spp).

(3) + 30, 41, 43 + 51 + double tr V spp + 150:

wakonidap^h# You (sg.) wash (it) for (him) ! (double tr V₃spp + 151); wakonido^h# You (pl.) wash it for (him) ! (double tr V₃spp + 152); wápakonidap^h# You (sg.) wash (them) for (him) !; hawápakonido^h You (pl.) wash them for (him), wash them for them ! (32 + 51 + double tr V₃spp + 152);

níwákonidani# You (sg.) wash (it) for me ! (41 + double tr V₃spp + 151).

3.1.3. Subsection 3.1.1. above treats sequences in which members of V combine with affixes 53 continuative, 54 momentaneous, 111 non-present, 121 hortative, 131 progressive, and 141 durative and the resulting subclassification of V according to association with certain of these affixes. Subsection 3.1.2. treats sequences in which members of V combine with affixes 30 and 40 goal, 51 plural, and 150 imperative and the resulting subclassification of V according to association with one or more of these affixes. In this subsection, we treat sequences in which members of V combine with members of both of these sets of affixes and the co-occurrence relationships between members of one of the sets of affixes and members of the other. The operations involved here result in a synthesis of the two sets of subclasses established in subsections 3.1.1. and 3.1.2.

Subclasses V₁, V₂, and V₃ attested by virtue of association with certain of the affixes 53, 54, 111, 121, 131, and 141 are further subclassified as tr V₁, intr V₁, double tr V₁, tr V₂, intr V₂, tr V₃, intr V₃, and double tr V₃ according to their association with one or more of the affixes 30, 40, 51, and 150.

Those members of V₁ which may combine with one or the other or both of the suffixes 150 imperative and are incompatible with prefixes 30, 40 goal and labeled intr V₁. These intr V₁ which may combine with 151 imperative sg. and are incompatible

with 152 imperative pl. and 51 plural are labeled intr V_{1s}. Members of intr V₁ which may combine with 152 imperative pl. and are incompatible with 151 imperative sg. and 51 plural are labeled intr V_{1p}. Those intr V₁ which may combine with both suffixes 150 imperative and are incompatible with 51 plural are labeled intr V_{1sp}. Certain members of intr V_{1b} may combine with 51 plural and are accordingly labeled intr V_{1b}spp (members of V_{1a} are incompatible with 51). In combination with members of intr V_{1b}spp, 152 imperative pl. obligatorily co-occurs with either 51 plural or 53 continuative; 151 imperative sg. may or may not co-occur with 53 and is incompatible with 51 in combination with intr V_{1b}spp.

Examples of intr V₁ are given below (for additional examples, see subsection 3.1.1. under V₁ and 3.1.2. under intr V):

dá[?]ip[?]i# You (sg.) fly ! (intr V_{1as} + 151); dá[?]i·dap[?]i# You (sg.) keep flying ! (53 + intr V_{1as} + 141 + 151). (53 + intr V_{1as} + 141 + 151).

n[?]i[?]wo·# You (pl.) fly ! (intr V_{1ap} + 152); n[?]i[?]·do·# You (pl.) keep flying ! (53 + intr V_{1ap} + 141 + 152).

kó·si[?]n[?]i# You (sg.) sleep ! (intr V_{1b}spp + 151); kó·s[?]i[?]dap[?]i# You (sg.) keep sleeping ! (intr V_{1b}spp + 141 + 151); kó[?]k[?]isa·dap[?]i# You (sg.) keep sleeping ! (53 + intr V_{1b}spp + 141 + 151); kó·k[?]iso·# You (pl.) sleep ! (51 + intr V_{1b}spp + 152); kó[?]k[?]isa·do·# You (pl.) keep sleeping ! (53 + intr V_{1b}spp + 141 + 152).

má'dani# You (sg.) run ! (intr V_{1b}s + 151)
 má'má'da·dani# You (sg.) keep running ! (53 + intr V_{1b}s +
 141 + 151).

wó'po[?]yo·# You (pl.) run ! (intr V_{1a}p + 152);
 wó'po·do·# You (pl. keep running) ! (53 + intr V_{1a}p + 141 +
 152).

gí[?]in# You (sg.) get fat ! (intr V_{1a}sp + 151);
 gí[?]iwó·# You (pl.) get fat ! (intr V_{1a}sp + 152).

Those members of V₁ which may combine with some or all of the affixes 30, 40 goal, 51 plural, and 150 imperative are labeled tr V₁. Members of tr V₁ which may combine with prefixes 31, 41, 42 and are incompatible with 32, 43, 44 and 51 are labeled tr V_{1s}. Those tr V₁ which may combine with 30, 43, 44 and are incompatible with 41, 42, and 51 are labeled tr V_{1p}. Those members of tr V₁ which may combine with all of the prefixes 30, 40 and are incompatible with 51 are labeled tr V_{1sp}. Certain members of tr V_{1b} may combine with 51 plural as well as with prefixes 30, 40; these are labeled tr V_{1b}spp. In combination with tr V_{1b}spp, prefixes 32, 43, and 44 obligatorily co-occur with either 51 plural or 53 continuative; prefixes 41 and 42 may or may not co-occur with 53 and are incompatible with 51 in combination with tr V_{1b}spp. Prefix 31 may or may not co-occur with 51 or 53 in combination with tr V_{1b}spp.

Examples of tr V₁ are given below (for additional examples, see subsection 3.1.1. under V₁ and 3.1.2. under tr V):
 ha[?]u[?]u· to take them cont. (32 + 53 + tr V_{1a}p);

?imí?uí to take you (pl.), non-pres. (44 + tr V_{1a}p + 111).

nímú?ani # You (sg.) kill me : (41 + tr V_{1a}s + 151);

?ímúa?i to kill oneself (non-first person), hort. (31 + tr V_{1a}s + 121); mímúa to kill you (sg.), non-pres. (42 + tr V_{1a}s + 111).

?míkókida° to kill you (pl.), cont. (44 + 53 + tr V_{1b}p).

hawú°pí to rope them, non-pres. (32 + 51 + tr V_{1b}spp + 111); hawúpida°dí to rope them, cont., dur. (32 + 53 + tr V_{1b}spp + 141); nímú° to rope, tie me, non-pres. (41 + tr V_{1b}spp + 111); tímú°pí to rope, tie us, non-pres. (43 + 51 + tr V_{1b}spp + 111).

hačú°čá to extinguish them (32 + 51 + tr V_{1b}spp + 111); hačúčisa° to extinguish them cont. (32 + 53 + tr V_{1b}spp); ?ičúi to extinguish self, go out (31 + tr V_{1b}spp + 111).

habá° to swallow them, eat them (32 + tr V_{1b}sp + 111); nábá°?i to eat me up, hort. (41 + tr V_{1b}sp + 121); bá°iwo° # You (pl.) swallow (it) : (tr V_{1a}sp + 152); habá°iní # You (sg.) swallow them (32 + tr V_{1a}sp + 151); bábá°do° # You (pl.) keep eating (it) : (53 + tr V_{1a}sp + 141 + 152).

A single member of V_{1b} occurs in the data which may combine with 30, 40, and with the prefix sequence 32 + 40; it is incompatible with 51 plural and is accordingly labeled double tr V_{1b}sp. In the corpus collected, there are no other examples of V₁ which may combine with the prefix sequence 32 + 40 diagnostic of double tr V.

Examples of double tr V_{1b}sp are given below (for additional examples, see 3.1.1. under V₁ and 3.1.2. under double tr V).

hamámá° to give them to you, non-pres. (32 + 42 + double tr V_{1b}sp + 111); tímámíka° to give to us, cont. (43 + 53 + double tr V_{1b}sp); hanámá°kí to give them to me (32 + 41 + double tr V_{1b}sp).

Those members of V₂ which may combine with both suffixes 150 imperative and are incompatible with prefixes 30, 40 goal are labeled intr V₂sp. All members of V₂ are incompatible with 51 plural. No examples occur in the data of members of V₂ which are incompatible with either of the two suffixes 150 imperative.

Examples of intr V₂sp are given below.

bí·bítí to excrete, mom. (54 + intr V₂sp);
 bí·bítaní# You (sg.) excrete ! (54 + intr V₂sp + 151);
 bí·bító°# You (pl.) excrete ! (54 + intr V₂sp + 152).

Those members of V₂ which may combine with prefixes 30, 40 goal are labeled tr V₂sp.

No examples occur in the data of members of V₂ which may combine with prefixes 31, 41, and 42 and are incompatible with 32, 43, 44 or of members of V₂ which may combine with 30, 43, 44 and are incompatible with 42, 41. All members of V₂ occurring in the data are incompatible with the prefix sequence 32 + 40.

Examples of tr V₂sp are given below (for additional examples, see subsection 3.1.1. under V₂ and 3.1.2. under

tr V sp).

wó·nipi# You (sg.) pluck ! (tr V_{2sp} + 151);
hawó·poni to pull them up (as weeds), mom. (32 + 54 +
tr V_{2sp}).

nigí·gíwi to strike me, mom. (41 + 54 + tr V_{2sp});
hagí·gí to strike them, non-pres. (32 + 54 + tr V_{2sp} + 111).

mičí·čigi to name you, mom. (42 + 54 + tr V_{2sp});
tičí·čí to name us, non-pres. (43 + 54 + tr V_{2sp} + 111).

hadó·dái to have intercourse with them, non-pres.
(32 + 54 + tr V_{2sp} + 111); dó·domani# You (sg.) have inter-
course (with her) ! (54 + tr V_{2sp} + 151); mídó·domi to have
intercourse with you, mom. (42 + 54 + tr V_{2sp}).

Those members of V₃ which may combine with suffixes 150 imperative and are incompatible with prefixes 30, 40 goal are labeled intr V₃. Those intr V₃ which are incompatible with 51 plural are labeled intr V_{3sp}; those intr V₃ which may combine with 51 plural are labeled intr V_{3spp}. In combination with members of intr V_{3spp}, 152 imperative pl. obligatorily co-occurs with 51, and 151 imperative sg. is incompatible with 51.

Examples of intr V₃ are given below (for additional examples see in subsection 3.1.1. under V₃ and in subsection 3.1.2. under intr V).

híhi· to go, pl. actor, non-pres. (51 + intr V_{3spp}
+ 111); híhimio# You (pl.) go ! (51 + intr V_{3spp} + 152);
hímini# You (sg.) go ! (intr V_{3spp} + 151).

ni·no· to speak, pl. actor, non-pres. (51 + intr V_{3spp}

+ 111); niokadi to speak, sg. actor, dur. (intr V_{3spp} + 141); ni¹•pokadi to speak, pl. actor, dur. (51 + intr V_{3spp} + 141); niokidani # You (sg.) keep speaking ! (intr V_{3spp} + 141 + 151); ni¹•pokido # You (pl.) keep speaking ! (51 + intr V_{3spp} + 141 + 152).

čiki¹pi to work, non-pres. (intr V_{3sp} + 111); čiki¹panidani # You (sg.) keep working ! (intr V_{3sp} + 141 + 151); čiki¹pano # You (pl.) work ! (intr V_{3sp} + 152).

ʔi¹ʔiho to cough, non-pres. (intr V_{3sp} + 111); ʔi¹ʔihogani # You (sg.) cough ! (intr V_{3sp} + 151); ʔi¹ʔihogo # You (pl.) cough ! (intr V_{3sp} + 152).

These members of V₃ which may combine with some or all of the affixes, 30, 40 goal, 51 plural, and 150 imperative are labeled tr V₃. Those tr V₃ which may combine with prefixes 31, 41, 42 and are incompatible with 32, 43, 44 and 51 are labeled tr V_{3s}. Members of tr V₃ which may combine with prefixes 30, 43, 44 and are incompatible with 41, 42 and 51 are labeled tr V_{3p}. Members of tr V₃ which may combine with all of the prefixes 30, 40 and are incompatible with 51 are labeled tr V_{3sp}. Those members of tr V₃ which may combine with all of the prefixes 30, 40 and with 51 are labeled tr V_{3spp}. In combination with members of tr V_{3spp}, prefixes 32, 43, and 44 obligatorily co-occur with 51, and prefixes 41, 42 and are incompatible with 51. Prefix 31 may or may not co-occur with 51 in combination with tr V_{3spp}.

Examples of tr V₃ are given below (for other examples see in subsection 3.1.1. under V₃ and in subsection 3.1.2. under tr V).

námáličí to start me running, non-pres. (41 + tr V_{3s} + 111); mámáličudadž to cause you to run, dur. (42 + tr V_{3s} + 141); ʔámáličí to cause oneself to run (non-first person) (31 + tr V_{3s} + 111).

ʔápná·náččí to cause selves to fly, to be thrown non-pres. (31 + tr V_{3p} + 111); haná·náčudahimá to throw them, prog. (32 + tr V_{3p} + 131).

haʔó·mi to break them, non-pres. (32 + tr V_{3p} + 111).

náčikápanidá to work for me (41 + tr V_{3sp}); hačikápaná to work for them, non-pres. (32 + tr V_{3sp} + 111); máčikápanidahimá to work for you, prog. (42 + tr V_{3sp} + 131); táčikápanidadž to work for us, dur. (43 + tr V_{3sp} + 141).

nádágákoná to wipe me off (41 + tr V_{3spp}); hadádágáko· to wipe them off, non-pres. (32 + 51 + tr V_{3spp} + 111); ʔámádádágákonahimá to wipe you (pl.) off, prog. (44 + 51 + tr V_{3spp} + 131); ʔídádágákonadž to wipe selves off, dur. (31 + 51 + tr V_{3spp} + 141).

Those members of V₃ which may combine with prefixes 30, 40 goal and with the prefix sequence 32 + 40 are labeled double tr V₃. Certain members of double tr V₃ may combine with 51 plural, while other members are incompatible with that affix. Members of double tr V₃ which are incompatible with 51 are labeled double tr V_{3sp}. Those double tr V₃ which may combine with 51 are labeled double tr V_{3spp}. In combination with double tr V_{3spp}, the prefix sequence 32 + 40 obligatorily co-occurs with 51; prefixes 40, unaccompanied by 32, may or may not co-occur with 51 in combination with double tr V_{3spp}.

Examples of double tr V₃ are given below (for other examples see in subsection 3.1.1. under V₃ and in subsection 3.1.2. under double tr V).

hap^ʔi^ʔičud^ʔ to give me a drink (32 + 41 + double tr V₃sp); ham^ʔi^ʔič^ʔ to give you a drink, non-pres. (32 + 42 + double tr V₃sp + 111).

hapimásiča[•] to teach me some, non-pres. (32 + 41 + double tr V₃sp + 111); hatimásičamahim^ʔ to teach us some, prog. (32 + 43 + double tr V₃sp + 131); ^ʔimásičamad^ʔ to teach oneself (non-first person), dur. (31 + double tr V₃sp + 141); ^ʔimásičam^ʔdo[•]# You (pl.) keep going to school, teaching yourselves ! (31 + double tr V₃sp + 141 + 152).

hapiwó[•]nid^ʔ to pluck them for me (32 + 41 + double tr V₃sp); ha^ʔimiwó[•]n^ʔ to pluck them for you (pl.), non-pres. (32 + 44 + double tr V₃sp + 111); hatiwó[•]nidahim^ʔ to pluck them for us, prog. (32 + 43 + double tr V₃sp + 131); hamiwó[•]nidad^ʔ to pluck them for you (sg.) dur. (32 + 42 + double tr V₃sp + 141).

hanidádag^ʔkonid^ʔ to wipe them for me (32 + 41 + 51 + double tr V₃spp); hanidádag^ʔkon^ʔ to wipe them for you (sg), non-pres. (32 + 42 + 51 + double tr V₃spp + 111); tidág^ʔkonid^ʔdad^ʔ to wipe (it) for us, dur. (43 + double tr V₃spp + 141); ^ʔimidádakonidahim^ʔ to wipe (them) for you (pl.), prog. (44 + 51 + double tr V₃spp + 131).

The co-occurrence of affixes 53, 54, 111, 121, 131, and 141 with each other in combination with members of V is treated in subsection 3.1.1. In subsection 3.1.2., the co-

occurrence of affixes 30, 40, 51, and 150 and their combination with members of V are treated. In the following paragraphs, we treat sequences in which members of the set of affixes 53, 54, 111, 121, 131, 141 co-occur with members of the set 30, 40, 51, and 150 in combination with members of V.

53 continuative may co-occur with prefixes 30, 40 goal in combination with members of tr V₁ and double tr V₁. In combination with double tr V₁, it may co-occur with the prefix sequence 32 + 40. 54 is compatible with 51 plural; it may co-occur with 150 imperative in combination with intr, tr, double tr V₁. In sequence with 150, 53 obligatorily co-occurs with 141 durative.

54 momentaneous may co-occur with 30, 40 goal in combination with members of tr V₂; it co-occurs with 150 in combination with intr, tr V₂.

111 non-present and 131 progressive co-occur with 30, 40 goal in combination with tr V_{1,2,3}, double tr V_{1,3} and with the prefix sequence 32 - 40 in combination with double tr V_{1,3}. Both co-occur 51 in combination with intr, tr V_{1,3}spp and double tr V₃spp. 111 and 131 are incompatible with 150 imperative.

Suffix 121 hortative co-occurs with 30, 41, 43 goal in combination with members of tr V_{1a}; it is incompatible with 42, 44 2 sg., pl., goal, with 51 plural and with 150 imperative.

Suffix 141 durative co-occurs with 30, 40 goal in combination with tr V_{1,2,3} and double tr V_{1,s} and with the prefix sequence 32 + 40 in combination with double tr V_{1,3}. 141 may

co-occur with 51 plural in combination with members of intr, tr V_{1,3}spp or double tr V₃spp. It may co-occur with 150 imperative in combination with V_{1,2,3}.

The following formulae express the co-occurrence relationships obtaining between members of the affix set 53, 54, 111, 121, 131, 141 and members of the set 30, 40, 51, 150. Co-occurrence of affixes within each set and their combination with members of stem class V are generalized in these formulae; actually occurring sequences are according to the co-occurrence and combinatorial relationships covered in subsections 3.1.1. and 3.1.2. Each formula is accompanied by one or more examples.

(1) $\pm 30, 40 + 53 + \underline{V} \pm 131, (141 \pm 150)$:

wúpída° to rope, tie, cont. ($53 + \underline{tr V_{1b}spp}$); hawúpída° to rope them, cont. ($32 + 53 + \underline{tr V_{1b}spp}$); hawúpída°himí to rope them, cont., prog. ($32 + 53 + \underline{tr V_{1b}spp} + 131$); wúpída°dí to rope, cont., dur. ($53 + \underline{tr V_{1b}spp} + 141$); ?ímíwúpída°dí to tie you (pl.) up, cont., dur. ($44 + 53 + \underline{tr V_{1b}spp} + 141$); wúpída°daní # You (sg.) keep roping ! ($53 + \underline{tr V_{1b}spp} + 141 + 151$); hawúpída°do° # You (pl.) keep on roping them ! ($32 + 53 + \underline{tr V_{1b}spp} + 141 + 152$).

kíkí° to bite, cont. ($53 + \underline{tr V_{1a}sp}$); kíkí°himí to bite, cont., prog. ($53 + \underline{tr V_{1a}sp} + 131$); níkíkí°dí to bite me, cont., dur. ($41 + 53 + \underline{tr V_{1a}sp} + 141$); kíkí°daní # You (sg.) keep on biting ! ($53 + \underline{tr V_{1a}sp} + 141 + 151$); kíkí°do° # You (pl.) keep on biting ! ($53 + \underline{tr V_{1a}sp} + 141 + 152$).

mímída° to run, sg. actor, cont. ($53 + \underline{intr V_{1b}s}$); mímída°himí to run, cont., prog. ($53 + \underline{intr V_{1b}s} + 131$); mímída°dí to run, cont., dur. ($53 + \underline{intr V_{1b}s} + 141$);

mámáda·daní # You (sg.) keep on running ! (53 + intr V_{1b}s + 141 + 151).

wópo· to run, pl. actor, cont. (53 + intr V_{1ap});

wópo·himí to run, cont., prog. (53 + intr V_{1ap} + 131); wópo·dí to run, cont. dur. (53 + intr V_{1ap} + 141); wópo·do· # You(pl.) keep on running ! (53 + intr V_{1ap} + 141 + 152).

(2) + 32+40 + 53 + V ± 131, 141:

hanímámíka· to give them to me, cont. (32 + 41 + 53 + double tr V_{1b}sp); hanímámíka·himí to give them to you (sg.) cont., prog. (32 + 42 + 53 + double tr V_{1b}sp + 131); hatímámíka·dí to give them to us, cont., dur. (32 + 43 + 53 + double tr V_{1b}sp + 141).

(3) ± 30, 40 + 54 + V ± 111, 141, 150:

gí·gíwí to strike (with a stick) mom. (54 + tr V₂sp); gí·gí to strike, non-pres. (54 + tr V₂sp + 111); nígí·gíwadí (rare) to strike me dur. (41 + 54 + tr V₂sp + 141); gí·gíwani # You (sg.) strike once ! (54 + tr V₂sp + 151); nígí·gí to strike me, non-pres. (41 + 54 + tr V₂sp + 111); mígí·gíwí to strike you (sg.) mom. (42 + 54 + tr V₂sp); [?]ígí·gíwani # You (sg.) strike your self ! (31 + 54 + tr V₂sp + 151); tígí·gí to strike us, non-pres. (43 + 54 + tr V₂sp + 111).

bí·bíti to excrete, mom. (54 + intr V₂sp); bí·bí to excrete, non-pres. (54 + intr V₂sp + 111); bí·bíyadi to excrete, dur. (54 + intr V₂sp + 141); bí·bíyani # You (sg.) excrete ! (54 + intr V₂sp + 151); bí·bíto· # You (pl.) excrete ! (54 + intr V₂sp + 152).

(4) ± 30, 40 ± 51 + V ± 111, 131, 150, (141 ± 150):

wú·d̥i to rope (tr V_{1b} spp); n̥iwú· to rope, tie me, non-pres. (41 + tr V_{1b} spp + 111); m̥iwú·dahim̥i to tie you, prog. (42 + tr V_{1b} spp + 131); hawú·p̥id̥ad̥i to tie them, dur.; ?im̥iwú·p̥i to tie you (pl.) non-pres. (44 + 51 + tr V_{1b} spp + 111); t̥iwú·p̥id̥ido·# You (pl.) keep tying us up ! (43 + 51 + tr V_{1b} spp + 141 + 152); hawú·p̥id̥an̥i# You (sg.) tie them up, rope them ! (32 + 51 + tr V_{1b} spp + 151).

n̥i'ʔi to sing (intr V_{1a} sp); n̥i'ʔid̥an̥i# You (sg.) keep singing ! (intr V_{1a} sp + 141 + 151); n̥i'ʔido·# You (pl.) keep singing ! (intr V_{1a} sp + 141 + 152).

wákon̥i to wash, baptize (tr V_3 spp); ?iwáko· to wash oneself, non-pres. (31 + tr V_3 spp + 111); hawáp̥ikonahim̥i to wash them, prog. (32 + 51 + tr V_3 spp + 131); n̥iwákonad̥i to wash me dur. (41 + tr V_3 spp + 141); t̥iwáp̥ikon̥id̥an̥i# You (sg.) keep washing us ! (43 + 51 + tr V_3 spp + 141 + 151).

č̥ík̥ipan̥i to work (intr V_3 sp); č̥ík̥ipan̥id̥an̥i# You (sg.) keep working ! (intr V_3 sp + 141 + 151).

g̥íw̥i to strike (with a stick) (tr V_2 sp); n̥íg̥íwad̥i to strike me, dur. (41 + tr V_2 sp + 141); n̥íg̥íwid̥an̥i# You (sg.) keep striking me ! (41 + tr V_2 sp + 141 + 151); hag̥íwid̥o·# You (pl.) keep striking them ! (32 + tr V_2 sp + 141 + 152).

(5) ± 32 + 40 ± 51 + V ± 111, 131, 141:

n̥imás̥ič̥am̥i to teach me (51 + double tr V_3 sp); han̥imás̥ič̥a· to teach me some, non-pres. (32 + 41 + double tr V_3 sp + 111); han̥imás̥ič̥amahim̥i to teach you some, prog. (32 + 42 + double tr V_3 sp + 131); hat̥imás̥ič̥amad̥i to teach us

some, dur. (32 + 43 + double tr V₃sp + 141).

námá'kí to give to me (41 + double tr V_{1b}sp);
hamámá' to give them to you (sg.), non pres. (32 + 42 +
double tr V_{1b}sp + 111); ha[?]ímámá'kahimí to give them to you
(pl.), prog. (32 + 44 + double tr V_{1b}sp + 131); hanámá'kadí
to give them to me, dur. (32 + 41 + double tr V_{1b}sp + 141).

níwákonidí to wash for me (41 + double tr V₃spp);
hamíwáponí to wash them for you, non-pres. (32 + 42 + 51 +
double tr V₃spp + 111); haníwáponidahimí to wash them
for me, prog. (32 + 41 + 51 + double tr V₃spp + 131);
hatíwáponidadí to wash them for us, dur. (32 + 43 + 51 +
double tr V₃spp + 141).

(6) ± 30, 41, 42 + V + 121:

kí'í to bite, hort. (tr V_{1a}sp + 121); í'íkí'í to
bite self, hort. (31 + tr V_{1a}sp + 121); níkí'í to bite
me, hort. (41 + tr V_{1a}sp + 121); tíkí'í to bite us, hort.
 (43 + tr V_{1a}sp + 121).

bá'í to swallow, hort. (tr V_{1a}sp + 121); habá'í
to swallow them, hort. (32 + tr V_{1a}sp + 121); níbá'í to eat
me up, hort. (41 + tr V_{1a}sp + 121).

múa'í to kill, single goal, hort. (tr V_{1a}s + 121);
ímúa'í to kill yourself, hort. (31 + tr V_{1a}s + 121);
nímúa'í to kill me, hort. (41 + tr V_{1a}s + 121).

3.1.4. The present subsection treats sequences in which members of V occur in combination with affixes 161 -kí~ -okí successive, having verbed, 162 -čí contemporaneous, while verbing; 11 sí-intensive; 21 ta- indefinite agent, 22 ču-

indefinite object, 411 -m̄ adverbial₁, 412 -ma' adverbial₂; and 52 (reduplicative) distributive.

Subsection 3.1.4.1., below, treats sequences in which members of V combine with suffixes 160. 3.1.4.2. treats sequences in which prefix 11 co-occurs with affixes 30, 40, 53, 54, 111, 121, 131, and 141 in combination with certain members of V. Subsection 3.1.4.3. treats those sequences in which members of V combine with the affixes 11, 20, and 410. Finally, subsection 3.1.4.4. treats sequences in which certain members of V combine with 52.

3.1.4.1. Verbs of subclasses established in the preceding subsections may combine with suffixes 161 -k̄~ -ok̄ successive, having verbed and 162 -č̄ contemporaneous, while verbing.

Suffix 161 may co-occur with prefixes 30, 40 goal in combination with members of tr, double tr V_{1,3}. In combination with members of intr, tr V₂, 161 obligatorily co-occurs with 54 momentaneous. It is incompatible with all other suffixes and with 53 continuative. No examples occur in the data in which 161 co-occurs with 51 plural.

Sequences in which members of V combine with 161 are given in formulae (1) through (4) below.

(1) + 30, 40 + tr, double tr V_{1,3} + 161:

ʔóid̄ to follow (tr V_{3sp}); haʔóid̄k̄ having followed them, among them (32 + tr V_{3sp} + 161).

n̄id̄ to see (tr V_{3sp}); n̄id̄ok̄ having seen him (tr V_{3sp} + 161); n̄n̄id̄ok̄ having seen me (41 + tr V_{3sp} + 161).

k̄ihin̄ to kick (tr V_{3sp}); mk̄ihinok̄ having kicked

you (42 + tr V_{3sp} + 161).

ʔiʔi to drink (tr V_{1asp}); ʔiʔokɪ having drunk (it)
(tr V_{1asp} + 161); haʔiʔokɪ having taken a drink, having
drunk some (32 + tr V_{1asp} + 161).

sikónidɪ to hoe for some one (double tr V_{3sp});
nɪsikónidɪkɪ having hoed for me (41 + double tr V_{3sp} + 161).

(2) intr V_{1,3} ± 161:

níokɪ to speak (intr V_{3spp}); níokɪkɪ having spoken
intr V_{3spp} + 161).

dáʔa to fly, jump sg. actor (intr V_{1as}); dáʔakɪ having
jumped, flown (intr V_{1as} + 161).

gíʔsɪ to fall, sg. actor (intr V_{1bs}); gíʔsokɪ having
fallen (intr V_{1bs} + 161).

(3) ± 30, 40 + 54 + tr V₂ ± 161:

wóʔonɪ to pluck, mom. (54 + tr V_{2sp}); wóʔonɪkɪ
having plucked (54 + tr V_{2sp} + 161); hawóʔonɪkɪ having
pulled them up (weeds) (32 + 54 + tr V_{2sp} + 161).

dóʔdomɪ to have intercourse, mom. (54 + tr V_{2sp});
dóʔdomɪkɪ having had intercourse (with her) (54 + tr V_{2sp} +
161); mɪdóʔdomɪkɪ having had intercourse with you (sg.)
(42 + 54 + tr V_{2sp} + 161).

(4) + 54 + intr V₂ ± 161 :

bíʔbitɪ to excrete, mom. (54 + intr V_{2sp}); bíʔbitɪkɪ
having excreted (54 + intr V_{2sp} + 161).

Suffix 162 may co-occur with prefixes 30, 40 goal in
combination with members of tr, double tr V_{1,3} and tr V₂. In
combination with members of V₁, 162 obligatorily co-occurs

with 141 durative and may or may not co-occur with 53 continua-
tive. It is incompatible with 54 momentaneous. The data indi-
cate that, in combination with $\underline{V}_{2,3}$, 162 is incompatible with
other suffixes.

Sequences in which members of \underline{V} combine with 162 are
given below.

(1) \pm 30, 40 \pm 53 + tr, double tr \underline{V}_1 + 141 \pm 162:

$\text{?u}^{\text{?}}\text{ad}\dot{\text{z}}$ to take pl. objects, dur. (tr \underline{V}_{1aP} + 141);
 $\text{?u}^{\text{?}}\text{a}\dot{\text{z}}\dot{\text{z}}\dot{\text{c}}\dot{\text{z}}$ while taking pl. objects (tr \underline{V}_{1aP} + 141 + 162);
 $\text{ha}^{\text{?}}\text{u}^{\text{?}}\text{u}\dot{\text{z}}\dot{\text{z}}\dot{\text{c}}\dot{\text{z}}$ while taking them, catching them (32 + 53 +
tr \underline{V}_{1aP} + 141 + 162); $\text{t}\dot{\text{z}}\text{?u}^{\text{?}}\text{u}\dot{\text{z}}\dot{\text{z}}\dot{\text{c}}\dot{\text{z}}$ while taking us (43 + 53 +
tr \underline{V}_{1aP} + 141 + 162).

$\text{k}\dot{\text{z}}\text{?s}\dot{\text{a}}\dot{\text{z}}\dot{\text{z}}$ to stand (something up), dur. (tr \underline{V}_{1bS} + 141);
 $\text{k}\dot{\text{z}}\text{?s}\dot{\text{a}}\dot{\text{z}}\dot{\text{z}}\dot{\text{c}}\dot{\text{z}}$ while standing (it) up (tr \underline{V}_{1bS} + 141 + 162).

(2) \pm 53 + intr \underline{V}_1 \pm 162:

$\text{m}\dot{\text{z}}\text{d}\dot{\text{z}}\dot{\text{a}}\dot{\text{z}}$ to run, sg. actor, dur. (intr \underline{V}_{1bS} + 141);
 $\text{m}\dot{\text{z}}\text{d}\dot{\text{z}}\dot{\text{a}}\dot{\text{z}}\dot{\text{z}}\dot{\text{c}}\dot{\text{z}}$ while running (intr \underline{V}_{1bS} + 141 + 162).
 $\text{d}\dot{\text{a}}^{\text{?}}\text{ad}\dot{\text{z}}$ to fly, sg. actor, dur. (intr \underline{V}_{1aS} + 141);
 $\text{d}\dot{\text{a}}^{\text{?}}\text{a}\dot{\text{z}}\dot{\text{z}}\dot{\text{c}}\dot{\text{z}}$ while flying (intr \underline{V}_{1aS} + 141 + 162); $\text{d}\dot{\text{a}}\dot{\text{d}}\dot{\text{z}}\dot{\text{z}}\dot{\text{z}}\dot{\text{c}}\dot{\text{z}}$
while flying along, while bucking (53 + intr \underline{V}_{1aS} + 141 + 162).

(3) \pm 30, 40 + tr $\underline{V}_{2,3}$ \pm 162:

$\text{?oid}\dot{\text{z}}$ to follow (tr \underline{V}_{3sp}); $\text{ha}^{\text{?}}\text{oi}\dot{\text{z}}\dot{\text{z}}\dot{\text{c}}\dot{\text{z}}$ while follow-
ing them, while being among them (32 + tr \underline{V}_{3sp} + 162).

$\text{n}\dot{\text{z}}\text{i}\dot{\text{z}}\dot{\text{z}}\dot{\text{c}}\dot{\text{z}}$ while looking (at him) (tr \underline{V}_{3sp} + 162);
 $\text{n}\dot{\text{z}}\text{n}\dot{\text{z}}\text{i}\dot{\text{z}}\dot{\text{z}}\dot{\text{c}}\dot{\text{z}}$ while looking at me (41 + tr \underline{V}_{3sp} + 162).

$\text{w}\dot{\text{o}}\text{?n}\dot{\text{z}}$ to pluck (tr \underline{V}_{2sp}); $\text{haw}\dot{\text{o}}\text{?n}\dot{\text{z}}\dot{\text{z}}\dot{\text{c}}\dot{\text{z}}$ while pluck-
ing them, while pulling them up (weeds) (tr \underline{V}_{2sp} + 162).

(4) + intr V₃ † 162 (no examples occur in the data of a member of intr V₂ in combination with 162).

níokǎ to speak (intr V₃spp); níokičǎ while speaking (intr V₃spp + 162).

3.1.4.2. The prefix 11 si- intensive may co-occur with affixes 30, 40, 53, 54, 11, 121, 131, 141 in combination with certain members of V.

Those members of V which may combine with 11 in sequences which include one of the affixes 111 non-present, 131 progressive, and 141 durative are labeled V in; those V which may not so occur are labeled V non-in. The subclassification V in, V non-in crosscuts and is independent of the subclasses attested in the preceding subsections.

Examples of V in are rare in the data; those which occur in the data are listed below:

wíá to ruin (tr V_{1a}sp in);

má•čǎ to know, learn (tr V_{1b}sp in);

gǎwǎ to strike (with a stick) (tr V₂sp in);

wáhuǎǎ to sweat (intr V₃sp in);

?ámíčudǎ to understand (tr V₃sp in).

Prefix 11 may co-occur with prefixes 30, 40 goal in combination with tr V_{1,2,3}sp in, with 53 continuative in combination with tr V₁sp in, with 54 momentaneous in combination with tr V₂sp in, and with 121 hortative in combination with tr V_{1a}sp in. 11 may co-occur with suffixes 111 non-present, 131 progressive, and 141 durative in combination with any V in. Sequences in which 11 co-occurs with these affixes in

combination with V in are listed and exemplified below.

(1) + 11 + 30, 40 + 53 + tr V₁in + 131, 141:

wípia to ruin, cont. (53 + tr V_{1a}sp); s^hwípia to ruin, cont. (11 + 53 + tr V_{1a}sp in); s^hhawípia to ruin them (11 + 32 + 53 + tr V_{1a}sp in); s^hhawípiahim^h to ruin them, cont., prog. (11 + 32 + 53 + tr V_{1a}sp in + 131); s^hhawípiad^h to ruin them, cont., dur. (11 + 32 + 53 + tr V_{1a}sp in + 141).

(2) + 11 + 30, 40 + tr V_{1,3}in + 111, 131, 141:

má·č^h to know, learn (tr V_{1b}sp in); s^hmá·č^h to (really) know (11 + tr V_{1b}sp in); s^hí·má·č^h to be good at it (non-first person) (11 + 31 + tr V_{1b}sp in); s^hí·má·i to get myself to know it non-pres. (11 + 41 + tr V_{1b}sp in + 111).

s^hwí·a to ruin (11 + tr V_{1a}sp in); s^hí·wí·a to ruin itself, non-pres. (11 + 31 + tr V_{1a}sp in + 111); s^hí·wí·him^h to ruin itself, prog. (11 + 31 + tr V_{1a}sp in + 131).

s^hí·ámí·čudad^h to understand, dur. (11 + tr V₃sp in + 141); s^hí·n^hí·ámí·čudad^h to understand me dur. (11 + 41 + tr V₃sp in + 141); s^hím^h·ámí·č^h to understand you, non-pres. (11 + 42 + tr V₃sp in + 111).

(3) + 11 + 30, 40 + (54 + tr V₂in + 111), (tr V₂in + 131, 141):

g^h·g^hwí to strike (with a stick), mom. (54 + tr V₂sp in); s^hí·n^hí·g^h·g^h to strike me, non-pres. (11 + 41 + 54 + tr V₂sp in + 111); s^hí·hag^h·g^hwí to strike them, mom. (11 + 32 + 54 + tr V₂sp in); s^hím^h·g^hwí to strike you (sg.) (11 + 42 + tr V₂sp in); s^hí·n^hí·g^hwad^h to strike me, dur. (11 + 41 + tr V₂sp in + 141); s^hí·g^hwahim^h to strike (him), prog. (11 +

tr V₂sp in + 131).

(4) + 11 + intr V₃in + 111, 131, 141:

síwáhudž to sweat (11 + intr V₃sp in); síwáhu
to sweat, non-pres. (11 + intr V₃sp in + 111); síwáhudahimž
to sweat, prog. (11 + intr V₃sp in + 131); síwáhudadž to
sweat, dur. (11 + intr V₃sp in + 141).

(5) + 11 + tr V_{1a}in + 121:

wía[?]i to ruin, hort. (tr V_{1a}sp in + 121); síwía[?]i
to ruin, hort. (11 + tr V_{1a}sp in + 121).

3.1.4.3. Sequences in which affixes 11, 20, and 410 co-occur in combination with members of V are treated in the present subsection.

11 intensive may co-occur with prefixes 20 indefinite agent, object, and 410 adverbial in combination with members of subclasses of V established in 3.1.1. and 3.1.2. Prefixes 21 ta- indefinite agent and 22 čů- indefinite object obligatorily co-occur with 410 adverbial in combination with V; they may or may not co-occur with 11 intensive in that combination. In combination with V, 412 -ma' adverbial₂ obligatorily co-occurs with 20 indefinite agent, object and may or may not co-occur with 11 intensive. Suffix 411 -mž adverbial₁ obligatorily co-occurs with one or more of the prefixes 11 intensive, 20 indefinite agent, object (i.e., at least one must be present) in combination with V.

Sequences in which members of V combine with affixes 11, 20, and 410 are listed in formulae (1,2) below.

(1) + 11 + V (non-att, stative) + 411:

sámá·čimí would like to know, learn (11 + tr V_{1b}sp
- 411).

síhímimí would like to go (11 + intr V₃spp + 411).

sípíokimí would like to speak (11 + intr V₃spp + 411).

síwípíamídámí would like to go hunting (11 + intr
V₃s + 411).

sí^íí^íimí would like to drink (11 + tr V_{1a}sp + 411).

sí^íí^í·nimí would like to smoke (11 + tr V₂sp + 411).

sípídámí would like to see (11 + tr V₃sp + 411).

síhí^íámí would like to urinate (11 + intr V_{1a}sp + 411).

(2) + 11 + 20 + V (non-att, stative) + 410:

sítahíhímíma· laughter inducing, funny (11 + 21 +
intr V₃sp + 412); tahíhímimí funny (21 + intr V₃sp + 411);
síčuhíhímimí full of laughter (11 + 22 + intr V₃sp + 411).

síta^í·bídamí frightening, (11 + 21 + tr V₃sp + 411);
ta^í·bídáma· frightening, fright inducing (21 + tr V₃sp + 412);
síču^í·bídamí cowardly, scared of things (11 + 22 + tr V₃sp
+ 411).

sítapídámí worth seeing (11 + 21 + tr V₃sp + 411);
sítapídáma· worth seeing, interesting (11 + 21 + tr V₃sp +
412); síčupídámí interested, always wanting to see things
(11 + 22 + tr V₃sp + 411).

tahí^íama· urine inducing, causing one to want to
urinate (21 + intr V_{1a}sp + 412); čuhí^íama· full of urine,
having to urinate (22 + intr V_{1a}sp + 412).

3.1.4.4. One member of V in the data may occur in
combination with 52 (reduplicative) distributive and with 51

(reduplicative) plural in such a way that a clear contrast is shown between 52 dist. and 51 plural: láʔasip̄ to trap (labeled tr V_{1b}sppd); láʔalaʔasip̄ to set traps out distributively (for them) (52 + tr V_{1b}sppd); láláʔasip̄ to trap them (51 + tr V_{1b}sppd).

Sequences in which 52 occurs in combination with tr V_{1b}sppd are given below:

(1) ± 30 + 52 + tr V_{1b}sppd ± 111, 131, 141:
haláʔalaʔasip̄ to trap them, dist. (32 + 52 + tr V_{1b}sppd); ʔiláʔalaʔasip̄ to get caught, dist. non-pres. (31 + 52 + tr V_{1b}sppd + 111); haláʔalaʔasip̄pahim̄ to trap them, dist., prog. (32 + 52 + tr V_{1b}sppd + 131); láʔalaʔasip̄pad̄ to trap, dist., dur. (42 + tr V_{1b}sppd + 141).

Certain members of att V (specifically att V sd) may combine with 52 (see 3.1.5.1.).

3.1.5 Sequences in which members of the restricted subclasses att V and stative V combine with affixes are treated in this subsection.¹ Members of att V are treated in 3.1.5.1., and members of stative V are treated in 3.1.5.2.

Members of these subclasses are restricted in terms of their combination with affixes. Of the affixes which are exclusively associated with V, members of att V combine only with 131 progressive. Certain members of att V (att V sp) may combine with 51 plural, and certain members of att V (att V sd) may combine with 52 distributive; this represents the total affix association of members of att V.

Members of stative V obligatorily combine with one or

the other of the suffixes 131 progressive or 141 durative. Certain stative V may combine with 51 plural. This represents the total of affix association of members of stative V.

3.1.5.1. All members of att V may combine with the suffix 131 -ahimĩ~ -himĩ progressive. In addition, certain att V may combine with one or the other of the affixes 51 plural or 52 distributive; certain att V may combine with neither of these.

Those att V which are incompatible with 51 and 52 are labeled att V s. Sequences in which members of att V s combine are included in the single formula (1) below.

(1) + att V s + 131:

?ónĩka· to become salty (att V s); ?ónĩka·himĩ to become salty, prog. (att V s + 131).

tópi· to become hot (att V s); tópi·himĩ to become hot, prog. (att V s + 131).

?í?owi· to become sweet (att V s); ?í?owi·himĩ to become sweet, prog. (att V s + 131).

Those att V which may combine with 51 plural and are incompatible with 52 distributive are labeled att V sp. Sequences in which members of att V sp combine with affixes are included in the formula (1) below.

(1) + 51 + att V sp + 131:

?úama· to become yellow (att V sp); ?úama· to become yellow, plural (51 + att V sp); ?úama·himĩ to become yellow, prog. (att V sp + 131); ?úama·himĩ to become yellow, pl. prog. (51 + att V sp + 131).

móika· to become soft (att V sp); mómoika· to become soft, pl. (51 + att V sp); móika·himí to become soft, prog. (att V sp + 131); mómoika·himí to become soft, pl., prog. (51 + att V sp + 131).

káwika· to become hard (att V sp); káwipika· to become hard, pl. (51 + att V sp); káwika·himí to become hard, prog. (att V sp + 131); káwipika·himí to become hard, pl., prog. (51 + att V sp + 131).

Those att V which may combine with 52 distributive and are incompatible with 51 plural are labeled att V sd. Sequences in which members of att V sd combine with affixes are included in the single formula (1) below.

(1) + 52 + att V sd + 131:

śáwadaika· to become thick, strong (as of rope) (att V sd); śá[?]aśiwadaika· to become thick, dist. (52 + att V sd); śáwadaika·himí (att V sd + 131); śá[?]aśiwadaika·himí to become thick, dist., prog. (52 + att V sd + 131).

śópolika· to become short (att V sd); śó[?]ośipolika· to become short, dist. (52 + att V sd); śópolika·himí to become short, prog. (att V sd + 131); śó[?]ośipolika·himí to become short, dist., prog. (52 + att V sd + 131).

wádadika· to become shiny, bald (att V sd); wá[?]apídadika· to become shiny, dist. (52 + att V sd); wádadika·himí to become shiny, prog. (att V sd + 131); wá[?]apídadika·himí to become shiny, dist., prog. (52 + att V sd + 131).

3.1.5.2. Members of stative V obligatorily combine

with one or the other of the suffixes 131 -ahimí ~ -himí progressive or 141 -dA durative. Certain members of stative V combine with 51 plural; these are labeled stative V spp. Members of stative V which are incompatible with 51 are labeled stative V s, stative V p, or stative V sp according to their co-occurrence with members of minor stem class P(ronoun) (see 4.1.).

Examples of stative V are given in two paragraphs below; paragraph (1) exemplifies stative V s, p, sp, and paragraph (2) exemplifies stative V spp.

(1) stative V + 131, 141:

kí·kahimí to stand, sg. actor, prog. (stative V s + 131); kí·kadí to stand, sg. actor, dur. (stative V s + 141).

čú·čikahimí to stand around, inanimate objects, prog. (stative V p + 131); čú·čikadí to stand around, dur. (stative V p + 141).

kí·kahimí to live, prog. (stative V sp + 131); kí·kadí to live, dur. (stative V sp + 141).

(2) + 51 + stative V spp + 131, 141:

dá·kahimí to sit, prog. (stative V spp + 131); dá·kadí to sit, dur. (stative V spp + 141); dáđ·hakahimí to sit, pl., prog. (51 + stative V spp + 131); dáđ·hakadí to sit, pl., dur. (51 + stative V spp + 141).

3.2. Morpheme sequences in which members of the large class of N(oun) stems occur in combination with affixes are treated in this section. Subclasses of N are established according to the combinatorial relationship between members

of N and affixes. Morpheme sequences involving members of N are described in terms of the co-occurrence relationships between affixes which may combine with N.

Affixes which may combine with members of N are those showing index numbers 10, 30, 40, 51, 200, and 400. Of these affixes, those showing index numbers 200 are exclusively associated with N. As examples of members of N in combination with suffixes 200, we cite the following:

síki'kigi full of houses, Phoenix (11 + 51 + inal N sp + 211); kí'čá'ídi inside the house (inal N sp + 221 612 + S₄); kí'čá his house (inal N sp + 241); kí'kačá by means of a house (inal N sp + 251).

sí'ónagi full of salt (11 + al N s + 211); 'óničá'ídi in the salt (al N s + 221 612 + S₄); 'ónigačá his salt (al N s + 231 + 241); 'ónikačá with, by means of salt (al N s + 251).

Members of N are grouped into two large subclasses on the basis of their occurrence in combination with the following affixes: 31 'í- non-1 reflexive, suus; 32 ha- 3 pl. goal, possessor; 41 pi- 1 sg. goal, possessor; 42 mi- 2 sg. goal, possessor; 43 ti- 1 pl. goal, possessor; 44 'imí- 2 pl. goal, possessor; 231 -ga'~ -ka' alienable possession; and 241 -čá 3 sg. possessor.

inal(ienable) N labels a subclass of N whose members combine with affixes 30, 40, and 241 and are incompatible with 231.

al(ienable) N labels a subclass of N whose members

in which members of subclasses inal N and al N, in that order, combine with affixes 30, 40, 51, 231, 241, and 251.

In combination with members of N, prefixes 30, 40 possessor are mutually exclusive. They may co-occur with 51 plural in combination with N sp and with 251 instrumental in combination with any N. In combination with members of al N, prefixes 30, 40 obligatorily co-occur with 231 alienable possession. They are incompatible with 241 3 sg. possessor.

Affix 51 plural may co-occur with affixes 30, 40, 241 in combination with any N sp and with 231 in combination with al N sp.

Suffix 231 alienable possession may co-occur with affixes 30, 40, 241, and 251 in combination with members of al N and with 51 in combination with al N sp.

Suffix 241 3 sg. possessor may co-occur with 51 in combination with any N sp and with 251 in combination with any N. In combination with al N, suffix 241 obligatorily co-occurs with 231 alienable possessor. It is incompatible with prefixes 30, 40.

Suffix 251 instrumental may co-occur with 30, 40, and 241 in combination with any N, with 231 in combination with al N, and with 51 in combination with any N sp.

Sequences in which members of inal N combine with affixes 30, 40, 51, 241, and 251 are included in the formulae (1,2) below.

- (1) $\pm 30, 40 + (\pm 51 + \text{inal N sp}), (\text{inal N s}) \pm 241$:
 wíhi eye (inal N sp); ?wíhi one's own eye

(31 + inal N sp); hawúhi their eye (unusual) (32 + inal N sp); ?íwú·pui one's own eyes (31 + 51 + inal N sp); hawú·pui their eyes (32 + 51 + inal N sp); nîwúhi my eye (41 + inal N sp); mîwúhi your eye (42 + inal N sp); wúikažǝ by means of an eye (inal N sp + 251); nîwúikažǝ by means of my eye (41 + inal N sp + 251); tîwú·pui our eyes (43 + 51 + inal N sp); ?ímîwú·pui your (pl.) eyes (44 + 51 + inal N sp); tîwú·puikažǝ by means of our eyes (43 + 51 + inal N sp + 251).

nówi hand (inal N sp); nó·nâhoi hands (51 + inal N sp); ?ínówi one's own hand (non-first person) (31 + inal N sp); hanó·nâhoi their hands (32 + 51 + inal N sp); ?ínó·nâhoikažǝ by means of one's own hands, your own hands, their own hands (31 + 51 + inal N sp + 251); nînówi my hand (41 + inal N sp); nînówikažǝ by means of my hand (41 + inal N sp + 251); mînówi your hand (42 + inal N sp); mînó·nâhoi your hands (42 + 51 + inal N sp); tînó·nâhoikažǝ by means of our hands (43 + 51 + inal N sp + 251).

mó'ó head (inal N sp); mó·mi heads (51 + inal N sp); ?ímó'ókažǝ by means of his, your own head (31 + inal N sp + 251); hamó·mi their heads (32 + 51 + inal N sp); ?ímó·mîkažǝ by means of your, their own heads (31 + 51 + inal N sp + 251); nîmó'ó my head (41 + inal N sp); nîmó'ókažǝ by means of my head (41 + inal N sp + 251); tîmó·mi our heads (43 + 51 + inal N sp); ?ímîmó·mi your (pl.) heads (44 + 51 + inal N sp).

číhilǝ scissors (inal N sp); číčilǝ plural pairs of scissors (51 + inal N sp); ?íčíhilǝ your, his, their own

scissors (31 + inal N sp); ʔičíčilíkaž by means of your,
his, their own scissors (31 + 51 + inal N sp + 251). máčihilí
your scissors (42 + inal N sp); máčíčilíkaž by means of
your plural pairs of scissors (42 + 51 + inal N sp + 251);
táčihilí our scissors (43 + inal N sp); ʔimáčíčilí your
(pl.) plural pairs of scissors. (44 + 51 + inal N sp).

lá·bisí pencil (inal N sp); lálabisí pencils
(51 + inal N sp); ɲilá·bisíkaž by means of my pencil (41 +
inal N sp + 251); mílá·bisíkaž by means of your pencil
(42 + inal N sp + 251); tílálabisíkaž by means of our
pencils (43 + inal N sp + 251); ʔimílálabisí your (pl.)
pencils (44 + 51 + inal N sp); ʔimílálabisíkaž by means
of your (pl.) pencils (44 + 51 + inal N sp + 251).

wí·bí milk (inal N s); ʔiwí·bí its, your, their
own milk (31 + inal N s); wí·bíkaž by means of milk
(inal N s + 251); ɲiwí·bíkaž with my milk (41 + inal N s
+ 251); hawí·bíkaž by means of their milk (32 + inal N s
+ 251); míwí·bí your milk (42 + inal N s); tíwí·bí our
milk (43 + inal N s).

hí·ʔi urine (inal N s); ɲihí·ʔi my urine (41 + inal
N s); míhí·ʔi your urine (42 + inal N s); tíhí·ʔi our
urine (43 + inal N s); ʔimíhí·ʔi your (pl.) urine (44 +
inal N s); hí·ʔikaž by means of urine (inal N s + 251).

ʔó·ʔó bone (inal N s); ʔó·ʔókaž by means of
bone (inal N s + 251); ɲíʔó·ʔó my bone(s) (41 + inal N s);
haʔó·ʔókaž by means of their bone(s) (32 + inal N s + 251);
tíʔó·ʔó our bone(s) (43 + inal N s).

(2) (+ 51 + inal N sp), (inal N s) + 241 + 251:
 báhi tail (inal N sp); bá·b^hhai tails, tail
feathers (51 + inal N sp); báhi₃ its tail (inal N sp +
 241); báka₃ by means of the tail (inal N sp + 251);
 báhi₃ka₃ by means of its (obviative) tail (inal N sp +
 241 + 251); bá·b^hhai₃ka₃ by means of its (obviative) tail
feathers (51 + inal N sp + 241 + 251).

hú·č₃ fingernail, claw (inal N sp); húhúč₃ ~ húh₃č₃
fingernails, claws (51 + inal N sp); hú·č₃ his fingernail,
its claw (inal N sp); húhúč₃ his fingernails, its claws
 (51 + inal N sp); hú·č₃ka₃ by means of its (obviative)
claw (inal N sp + 241 + 251).

ʔáti anus, buttocks (inal N sp); ʔátika₃ by means
of the buttocks (inal N sp + 251); ʔaʔati buttocks, pl.
 (51 + inal N sp); ʔáta₃ his buttocks (inal N sp + 241).

táti foot (inal N sp); tá·táti feet (51 + inal N sp);
 táda₃ his foot (inal N sp + 241); tá·táda₃ his feet
 (51 + inal N sp + 241); tá·táti₃ka₃ by means of the feet
 (51 + inal N sp + 251).

wí·bi milk (inal N s); wí·ba₃ its milk (inal N s
 + 241); wí·ba₃ka₃ by means of its milk (inal N s + 241 +
 251).

híʔi urine (inal N s); híʔi₃ his urine (inal
N s + 241).

Sequences in which members of al N combine with affixes
 30, 40, 51, 231, 241, and 251 are included in the formulae
 (1. 2. 3) below.

(1) (± 51 + al N sp), (al N s) ± 231, 251:

ʔú·sɪ́ stick, tree (al N sp); ʔúʔusɪ́ sticks, trees
 (51 + al N sp); ʔú·sɪ́ga· possessed tree, a tree is owned
 (al N sp + 231); ʔúʔusɪ́ga· possessed trees (51 + al N sp +
231); ʔú·sɪ́kaʒɪ́ by means of a stick (al N sp + 251);
 ʔúʔusɪ́kaʒɪ́ by means of sticks (51 + al N sp + 251).

hú·nɪ́ corn (al N s); hú·nɪ́ga· possessed corn
 (al N s + 231); hú·nɪ́kaʒɪ́ by means of corn (al N s + 251).

(2) + 30, 40 + (± 51 + al N sp), (al N s) +
 231 ± 251:

ʔúʔú·sɪ́ga· your, his, their own tree, stick (31 +
al N sp + 231); haʔúʔusɪ́ga· their sticks, trees (32 + 51 +
al N sp + 231); nɪ́ʔú·sɪ́ga· my stick, tree (41 + al N sp +
231); nɪ́ʔúʔusɪ́ga·kaʒɪ́ by means of my sticks (41 + 51 +
al N sp + 231 + 251); tɪ́ʔú·sɪ́ga· our stick, tree (43 +
al N sp + 231); ʔɪ́mɪ́ʔúʔusɪ́ga·kaʒɪ́ by means of your (pl.)
sticks (44 + 51 + al N sp + 231 + 251).

ʔɪ́háhaiwanɪ́ga· his, your, their own cows (31 + 51 +
al N sp + 231); haháhaiwanɪ́ga· their cows (32 + 51 +
al N sp + 231); nɪ́háiwanɪ́ga· my cow (41 + al N sp + 231);
 nɪ́háiwanɪ́ga· your cow (42 + al N sp + 231); tɪ́háhaiwanɪ́ga·
our cows (43 + 51 + al N sp + 231); ʔɪ́mɪ́háhaiwanɪ́ga· your
(pl.) cows (44 + 51 + al N sp + 231).

ʔɪ́wó·gɪ́ka· his, your, their own road, path (31 +
al N sp + 231); hawóogɪ́ka· their roads (32 + 51 + al N sp +
231); nɪ́wó·gɪ́ka· my road (41 + al N sp + 231); tɪ́wóogɪ́ka·
our roads (43 + 51 + al N sp + 231); ʔɪ́mɪ́wó·gɪ́ka· your (pl.)

road (44 + al N sp + 231).

ʔíhú·niga· his, your, their own corn (31 + al N s + 231); hahú·niga·kaǔ́ with their corn (32 + al N sp + 231 + 251); pihú·niga· my corn (41 + al N s + 231); mihú·niga· your corn (42 + al N s + 231); tihú·niga·kaǔ́ by means of our corn (43 + al N s + 231 + 251); ʔimihú·niga· your (pl.) corn (44 + al N s + 231).

ʔíʔóniga·kaǔ́ by means of his, your, their own salt (31 + al N s + 231 + 251); haʔóniga· their salt (32 + al N s + 231); piʔóniga· my salt (41 + al N s + 231); ʔimíʔóniga· your (pl.) salt (44 + al N s + 231).

(3) + (+ 51 + al N sp), (al N s) + 231 + 241 + 251:

ʔú·siga·ǔ́ his stick, tree (al N sp + 231 + 241); ʔúʔusiga·ǔ́ his sticks, trees (51 + al N sp + 231 + 241); ʔú·siga·ǔ́kaǔ́ by means of his (obviative) stick (al N sp + 231 + 241 + 251); ʔúʔusiga·ǔ́kaǔ́ by means of his (obviative) sticks (51 + al N sp + 231 + 241 + 251).

gógisiga·ǔ́ his dog (al N sp + 231 + 241); gógogisiga·ǔ́ his dogs (51 + al N sp + 231 + 241).

ʔóniga·ǔ́ his salt (al N s + 231 + 241); ʔóniga·ǔ́kaǔ́ by means of his (obviative salt (al N s + 231 + 241).

hú·niga·ǔ́ his corn (al N s + 231 + 241).

3.2.2. Sequences in which members of N (inal N s, sp; al N s, sp) combine with affixes 11, 51, 211, and 410 are treated in this subsection.

Prefix 11 si- intensive may co-occur with suffixes 211 existential and 410 adverbial in combination with members

of N. It may co-occur with 51 plural in combination with N sp.

51 plural may co-occur with affixes 11 intensive, 211 existential, and 410 adverbial in combination with N sp.

Suffix 211 -g̃ existential may co-occur with 11 intensive in combination with N, and with 51 plural in combination with N sp; it is incompatible with 410 adverbial.

Suffixes 411 -m̃ adverbial₁ and 412 -ma' adverbial₂ may co-occur with 11 intensive in combination with N, and with 51 plural in combination with N sp. They are incompatible with 211 existential and with each other.

Sequences in which members of N combine with the above listed affixes are given in formula (1) below (examples of N + 410 are quite rare in the data; N + 211 is quite frequent).

(1) $\pm 11 + (\pm 51 + \underline{N\ sp})$, $(\underline{N\ s}) \pm 211$, 410:

bá'banag̃ full of coyotes (51 + al N sp + 211);

sibá'banag̃ full of coyotes (11 + 51 + al N sp + 211);

sibánima' coyote like (11 + al N sp + 412).

sí'ú'uwim̃ fond of women (11 + 51 + al N sp + 411);

sí'ú'uwima' woman like (11 + 51 + al N sp + 412).

sikí'kig̃ full of houses, Phoenix (11 + 51 + inal N sp + 211).

sikákawiyu'g̃ full of horses (11 + 51 + al N sp + 211); sikákawiyu'm̃ fond of horses (11 + al N sp + 411).

há'şanig̃ there are saguaros (al N sp + 411);

sihá'şanig̃ full of saguaros (11 + al N sp + 211).

sihúkag̃ full of pines, Prescott (11 + al N s + 211).

sitó'big̃ full of cottontails (11 + al N sp + 211);

tótobig_± there are cottontails (51 + al N sp + 211).

simúmuwalig_± full of flies (11 + 51 + al N sp + 211).

sičú.wag_± full of jack rabbits (11 + al N s + 211).

siʔaʔalimaʔ child like (11 + 51 + al N sp + 412).

3.2.3. Sequences in which members of N combine with 221 -tá~-č_± sequence increment are treated in this subsection. Suffix 221 is exclusively associated with N.

In combination with members of N, 221 is incompatible with other affixes. An occurrence of a sequence of the type N + 221 implies the occurrence of an immediately following 612 + S, (see 4.2.).

Sequences in which N combines with 221 are included in the single formula (1) below.

(1) + N + 221 612 + S:

kí.č_± ʔíđ_± in the house (inal N sp + 221 612 + S₄).

ʔíwíđ_±č_± ʔíđ_± in the earth, ground (al N sp + 221 612 + S₄).

hú.p_±č_± ʔíđ_± in the corn (al N s + 221 612 + S₄).

ʔó.ʔod_±č_± ʔíđ_± in the sand (al N s + 221 612 + S₄).

ʔú.s_±t_± ʔán_± on the tree, stick, post (inal N sp + 221 612 + S₂).

káw_±yu.t_± ʔáb_± onto, against the horse (inal N sp + 221 612 + S₃).

wóʔot_± ʔám_± at the water hole (al N sp + 221 612 S₁).

3.3. In the present section, we treat morpheme sequences in which members of the class of A(ttribute) stems

occur in combination with affixes. Membership in A is quite large, but the class as a whole is unlike the other two major stem classes in that the number of affixes which are exclusively associated with it is quite small (two affixes, one of which combines only with a subclass of A), whereas, for the other two major stem classes, N and V, the number of divisive affixes is somewhat larger (five for N, twelve for V).

Affixes which combine with members of A are those showing index numbers 11, 51, 52, 300, and 400. Of the affixes combining with members of A, those included in century 300 are exclusively associated with A.

Of the suffixes 300, 321 -čú[?]u abstractive provides a frame which is diagnostic of A. All members of A may combine with 321. Examples of members of A in combination with 321 are given below:

sá[?]uamí[?]čú[?]u the yellow one (11 + adv₂A₁ + 321);
 sík[?]áwí[?]kí[?]čú[?]u the hard one (11 + adv₁A₁sp + 321);
 sáw[?]adí[?]kí[?]čú[?]u the thick one (as rope) (non-pred A₂ + 321);

gí[?]í[?]čú[?]u the big one (pred A₂ + 321).

Association with affixes 11 sí- intensive, 51 (redupl.) plural, 52 (redupl.) distributive, and 311 -[?]í predicative serves as a criterion for the establishment of two large subclasses of A.

A₁ labels a subclass of A whose members may combine with 11 intensive and are incompatible with 52 distributive and with 311 predicative. Certain members of A₁ may combine

with 51 plural; those which may be labeled \underline{A}_1 sp; those \underline{A}_1 which are incompatible with 51 are labeled \underline{A}_1 s.

\underline{A}_2 labels a subclass of \underline{A} whose members may combine with 52 distributive and are incompatible with 11 intensive and 51 plural. Certain members of \underline{A}_2 may combine with 311 predicative. Those \underline{A}_2 which may combine with 311 are labeled pred \underline{A}_2 ; those which are incompatible with 311 are labeled non-pred \underline{A}_2 .

Association of members of \underline{A} with suffixes 411 -má adverbial₁ and 412 -ma' adverbial₂ is as follows.

Certain members of \underline{A}_1 may combine with 411 adverbial₁ and are incompatible with 412 adverbial₂; these are labeled adv₁ \underline{A}_1 . Members of \underline{A}_1 which may combine with 412 adverbial₂ and are incompatible with 411 adverbial₁ are labeled adv₂ \underline{A}_1 . All members of \underline{A}_2 are incompatible with 412 adverbial₂, and all members of pred \underline{A}_2 are incompatible with 411 adverbial₁. All members of non-pred \underline{A}_2 may combine with 411 adverbial₁.

The reduplicatives 51 plural and 52 distributive occur in non-overlapping or complimentary distribution in combination with members of \underline{A} ; i.e., 51 combines with members of \underline{A}_1 , while 52 combines with members of \underline{A}_2 . 51 plural is a reduplicative having, in most of its occurrences, one or the other of the shapes $\text{CV}^\acute{\text{C}}\text{CV}\dots$ or $\text{CV}^\acute{\text{C}}\text{CV}\dots$. 52 distributive has one or the other of the shapes $\text{CV}^\acute{\text{C}}\text{V}^\text{?}\text{CV}\dots$ or $\text{CV}^\text{?}\text{V}^\text{?}\text{CV}^\text{?}\text{V}\dots$. The possibility of considering these shapes as members of a single morpheme is obviated by the contrast demonstrated in association with at least one member of \underline{V} (láłá'áşáípá 51 + \underline{V}

to trap plural objects : láʔalaʔasɨpi 52 + V to trap, dist.; see 3.1.4.4.). The possibility of isolating the intrusive /ʔ/ in 52 as a separate morpheme co-occurring with the reduplicative has not been considered here.

Similarly, in combination with members of A, suffixes 411 adverbial₁ and 412 adverbial₂ occur in non-overlapping distribution. There is no member of A which may combine with both 411 and 412 (though some members of V, N may; see 3.1.4.3. and 3.2.2.).

In the following paragraphs, we treat sequences in which members of A₁ and A₂, in that order, combine with affixes.

The co-occurrence relationships between affixes which may combine with A are stated in the immediately following paragraphs.

Prefix 11 sɨ- intensive, combining with A₁, may co-occur with 51 plural in combination with members of A₁sp, with 411 adverbial₁ in combination with adv₁A₁, and with 412 adverbial₂ in combination with adv₂A₁. It may co-occur with 321 abstractive in combination with any A₁. It is incompatible with members of A₂ and hence, with affixes 52 distributive and 311 predicative.

51 (redupl.) plural, combining with members of A₁, may co-occur with 11 intensive and with 321 abstractive in combination with A₁sp. It may co-occur with 411 adverbial₁ in combination with adv₁A₁sp and with 412 adverbial₂ in combination with adv₂A₁sp. It is incompatible with 311 predicative and with 52 distributive.

52 (redupl.) distributive, combining with members of

A_2 , may co-occur with 321 abstractive in combination with any A_2 and with 311 predicative in combination with pred A_2 . It may co-occur with 411 adverbial₁ in combination with non-pred A_2 . It is incompatible with 11 intensive and with 412 adverbial₂.

Suffix 311 - \check{z} predicative, combining with pred A_2 , may co-occur with 52 distributive. It is incompatible with 312 abstractive and with 411 adverbial₁. It is incompatible with A_1 and hence, with affixes 11 intensive and 412 adverbial₂.

Suffix 321 - $\check{c}u^{\check{r}}u$ abstractive, combining with all A , may co-occur with 11 intensive in combination with A_1 , with 51 plural in combination with A_1 sp, and with 52 distributive in combination with A_2 . It is incompatible with 410 adverbial and with 311 predicative.

Suffix 411 - $m\check{z}$ adverbial₁ may co-occur with 11 intensive in combination with adv₁ A_1 , with 51 plural in combination with adv₁ A_1 sp, and with 52 distributive in combination with non-pred A_2 . It is incompatible with affixes 311 predicative, 321 abstractive and 412 adverbial₂. Suffix 412 - ma^{\cdot} adverbial₂, combining with adv₂ A_1 , may co-occur with 11 intensive in combination with any adv₂ A_1 , and with 51 plural in combination with adv₂ A_1 sp. It is incompatible with suffixes 311 predicative, 321 abstractive, and 411 adverbial₁.

Sequences in which members of A_1 combine with affixes are given in formulae (1,2) below. Formula (1) represents sequences in which adv₁ A_1 occurs, and formula (2) represents sequences in which members of adv₂ A_1 occur.

(1) ± 11 + (± 51 + adv₁A₁sp), (adv₁A₁s) ± 321, 411:
káwíkí hard, difficult (adv₁A₁sp); síkáwíkí hard,
difficult (11 + adv₁A₁sp); síkáwípíkí hard, pl. (11 + 51 +
adv₁A₁sp); síkáwíkíčú[?]u the hard one (11 + adv₁A₁sp + 321);
síkáwípíkíčú[?]u the hard ones (11 + 51 + adv₁A₁sp + 321);
síkáwíkamí hard, with difficulty, diligently (11 + adv₁A₁sp
+ 411); síkáwípíkamí hard, pl. (as in to make them hard)
(11 + 51 + adv₁A₁sp + 411).

móikí soft (adv₁A₁sp); símóikí soft (11 + adv₁A₁sp);
símómoikí soft, pl. (11 + 51 + adv₁A₁sp); símóikíčú[?]u the
soft one (11 + adv₁A₁sp + 321); símómoikíčú[?]u the soft ones
(11 + 51 + adv₁A₁sp + 321); símóikamí softly, soft (11 +
adv₁A₁sp + 411).

sígíwíkí strong, stiff (11 + adv₁A₁sp); sígíwípíkí
strong, pl. (11 + 51 + adv₁A₁sp); gíwíkíčú[?]u the strong one
(adv₁A₁sp + 321); sígíwíkamí strongly, diligently (11 +
adv₁A₁sp + 411).

sí[?]í[?]owi sweet (11 + adv₁A₁s); í[?]í[?]owíčú[?]u the
sweet one, sugar (adv₁A₁s + 321); sí[?]í[?]owimí sweetly (11 +
adv₁A₁s + 411).

(2) ± 11 + (± 51 + adv₂A₁sp), (adv₂A₁s) ± 321, 412:
í[?]uamí yellow (adv₂A₁sp); sí[?]ú[?]amí yellow, pl. (11 +
51 + adv₂A₁sp); sí[?]ú[?]amíčú[?]u the yellow one, palomino (11 +
adv₂A₁sp + 321); sí[?]ú[?]amíčú[?]u the yellow ones (11 + 51 +
adv₂A₁sp + 321); sí[?]ú[?]amíma yellow, adv. (11 + adv₂A₁sp +
412); í[?]ú[?]amíma yellow, adv., pl. (51 + adv₂A₁sp + 412).
síčúkí black (11 + adv₂A₁sp); síčúčíkí black, pl.

(11 + 51 + adv₂A₁sp); síčúkičú[?]u the black one, Negro (11 + adv A₂sp + 321); čúčíkičú[?]u the black ones, Negroes (51 + adv₂A₁sp + 321); síčúkuma black, adv. (11 + adv₂A₁sp + 412); síčúčíkuma black, pl., adv. (11 + 51 + adv₂A₁sp + 412).

síwígi red (11 + adv₂A₁sp); síwípigi red, pl.

(11 + 51 + adv₂A₁sp); wígičú[?]u the red one, bay, redhead (adv₂A₁sp + 321); wígima red, adv. (adv₂A₁sp + 412).

sítuha white (11 + adv₂A₁sp); tó'ta white, pl.

(51 + adv₂A₁sp); sítuáču[?]u the white one (11 + adv₂A₁sp + 321); sítuhama white, adv. (11 + adv₂A₁sp + 412).

sítóni hot (11 + adv₂A₁sp); tóničú[?]u the hot one, lye (adv₂A₁s + 321); sítónima hot, adv. (11 + adv₂A₁s + 412).

Sequences in which members of A₂ combine with affixes are given in formulae (1,2) below. Formula (1) represents sequences in which members of non-pred A₂ combine, and formula (2) represents those in which members of pred A₂ combine.

(1) + 52 + non-pred A₂ + 321, 411:

sáwadiki thick, strong (as of rope) (non-pred A₂); sá[?]asíwadiki thick, dist. (52 + non-pred A₂); sáwadikičú[?]u the thick one (non-pred A₂ + 321); sá[?]asíwadikičú[?]u the thick ones, dist. (52 + non-pred A₂ + 321); sáwadikami thickly, thick, adv. (non-pred A₂ + 411); sá[?]asíwadikami thick, dist., adv. (52 + non-pred A₂ + 411).

sópoliki short (non-pred A₂); só[?]osípoliki short, dist. (52 + non-pred A₂); sópolikičú[?]u the short one (non-pred A₂ + 321); só[?]osípolikičú[?]u the short ones, dist. (52 + non-pred A₂ + 321); sópolikami short, adv. (non-pred A₂ + 411);

sóʔosɪpɔlɪkɪ short, dist. adv. (52 + non-pred A₂ + 411).

kómalɪkɪ thin, flat and thin (non-pred A₂);

kóʔokomɪkɪ thin, dist. (52 + non-pred A₂); kómalɪkɪčúʔu the thin one (non-pred A₂ + 321); kóʔokomɪkɪčúʔu the thin ones, dist. (52 + non-pred A₂ + 321); kómalɪkɪ thin, adv. (non-pred A₂ + 411); kóʔokomɪkɪ thin, dist., adv. (52 + non-pred A₂ + 411).

wádadɪkɪ shiny, bald (non-pred A₂); wáʔapɪdadɪkɪ shiny, dist. (52 + non-pred A₂); wádadɪkɪčúʔu the shiny one (non-pred A₂ + 321); wáʔapɪdadɪkɪčúʔu the shiny ones, dist. (52 + non-pred A₂ + 321); wádadɪkɪ shiny, adv. (non-pred A₂ + 411); wáʔapɪdadɪkɪ shiny, dist., adv. (52 + non-pred A₂ + 411).

(2) ± 52 + pred A₂ ± 311, 321:

čímɪ small (pred A₂); číʔɪčímɪ small, dist., (52 + pred A₂); čímaʒɪ small, pred. (pred A₂ + 311); číʔɪčímaʒɪ small, dist., pred. (52 + pred A₂ + 311); čímɪčúʔu the small one (pred A₂ + 321); číʔɪčímɪčúʔu the small ones, dist. (52 + pred A₂ + 321).

číwɪ long (pred A₂); číʔɪčíwɪ long, dist. (52 + pred A₂); číwaʒɪ long pred. (pred A₂ + 311); číʔɪčíwaʒɪ long, dist., pred. (52 + pred A₂ + 311); číwɪčúʔu the long one (pred A₂ + 321); číʔɪčíwɪčúʔu the long ones, dist. (52 + pred A₂ + 321).

gíʔɪ big (pred A₂); gíʔɪgɪdɪ big, dist. (52 + pred A₂); gíʔɪʒɪ big, pred. (pred A₂ + 311); gíʔɪgɪdaʒɪ big, dist., pred. (52 + pred A₂ + 311); gíʔɪčúʔu the big

one (pred A₂ + 321); g'igidč'u the big ones (52 +
pred A₂ + 321).

FOOTNOTE TO CHAPTER III

1. Certain stems which satisfy the criteria for membership in one or the other of the subclasses of V are multimorphemic. That is, there are certain morpheme sequences which can substitute (in some set of frames) for single morphemes of one subclass or other. The final morpheme in a multimorphemic stem is here termed a STEM FORMATIVE (not treated in this grammar).

All members of att V are multimorphemic, being sequences of the type A(tribute) plus -V[·] (long vowel appearing as / -i[·] / after { I }, as / -u[·] / after { U }, and as / -a[·] / after { A }) developmental, to become.

CHAPTER IV

MINOR STEMS AND AFFIXES

4. The present chapter is concerned with morpheme sequences in which members of the various minor stem classes occur in combination with affixes and, in the case of members of the minor stem class P(ronoun), sequences in which these co-occur with members of the major stem class V(erb) (see 3.1.) and with affixes combining with V.

Minor stem classes are those which have small, easily listable, inventories and whose members are individually frequent in texts. Classes of minor stems are established on the basis of occurrence in combination with divisive affixes; they are three in number: P(ronoun), S(patial), and Q(uantifier).

As in the case of affixes combining with major stems, we present an inventory of affixes with which members of the minor stem classes combine. Affixes are supplied with index numbers by which they are hereafter represented in morpheme sequence formulae. Affixes are grouped into centuries according to their stem association; affixes 500 combine with members of P, 600 with S, 700 with S and P, and 800 with Q. Within each century, affixes are grouped into decades whose members are mutually exclusive and similar in distribution.

Of the affixes in the following inventory, a total of six is divisive for P; four affixes are divisive for S;

and two are divisive for Q. Two suffixes, 711 and 712 combine with certain members of classes P and S.

Certain of the affixes which combine with major stems also combine with certain minor stems.

Prefixes 11 si- intensive; 31 ʔi- non-1 reflexive, suus; and 32 ha- 3 pl. goal, possessor may combine with members of P in certain sequences of the type ± 11 + 30 + 521 + P ± 531. An occurrence of a sequence of this type is always followed immediately by a member of V plus-minus certain affixes.

The reduplicative 52 distributive may combine with members of minor stem class Q (see 4.3.).

The inventory of affixes 500 through 800 is presented below. The distribution of multiple alternants of certain of these affixes is given in 2.2.

500 Affixes combining exclusively with members of P:

510 511: m- subjunctive;

512: n- interrogative;

513: k- introductive.

520 521.1: ʔa-~ -a-, 521.2: ʔo'-~ -o'-, 521,3: ʔv-, 521.4: -u- non-specified mode.

530 531.1: -tʔ, 531.2: -dʔ personal non-present.

540 541.1: ʔa'-, 541.2: ...V'... personal deictic.

600 Prefixes combining exclusively with members of S:

610 611.1: ʔi-, 611.2: ʔi'- proximal deictic;

612.1: ʔa-, 612.2: ʔa'-, 612.3: ʔi'- distal deictic;

613.1: g±-, 613.2: gá- ultradistal deictic;

614.1: h±-, 614.2: há- interrogative deictic.

700 Suffixes combining with members of P and S:

710 711.1: -i[?]i, 711.2: -a[?]a, 711.3: -a[?]i, 711.4: -i[·],

711.5: -a[·], 711.6: -ai demonstrative deictic, singular;

712: -m± demonstrative deictic, plural.

800 Suffixes combining exclusively with members of Q:

810 811.1: -ho[·], 811.2: -o[·] times;

812: -pa[·] places.

In the immediately following paragraphs, the relationships of order for each affix or set of distributionally similar affixes are defined. Each paragraph includes parenthetical reference to one or more following sections in which co-occurrences and combinations are treated.

Prefixes 510 occur word initially in all occurrences; they are always followed by the prefix 521. Sequences in which prefixes 510 combine are of the following type: ± 510 + 521 + P... (see 4.1.). Example: map± 1 sg., subjunctive (511 + 521 + P_{1s}).

Prefix 521 occurs adjacent to the stem in all its occurrences; it may or may not be preceded by one of the prefixes 510 in sequences of the type ± 510 + 521 + P... (see 4.1.). Example: nap±t± 2 sg. interrogative, non-present (512 + 521 + P_{2s} + 531). Prefix 521 may, in certain sequences, be preceded by 11 and/or 30: ± 11 + 30 + 521 + P... (see 4.1.). Example: s±[?]±[?]±-Ø-t± ↓ wía # It got ruined, it ruined itself. (11 + 31 + 521 + P_{3sp} + 531 + tr V_{1a}sp in + 111).

Suffix 531 occurs adjacent to the stem and word finally (not followed by other suffixes) in all its occurrences: ...P + 531 (see 4.1.). Example: ʔatit̩ 1 pl., non-specified mode, non-present (521 + P₁p + 531).

Prefix 541 occurs word initially and adjacent to the stem in all of its occurrences: + 541 + P... (see 4.1.). Example: ʔá·pim̩ 2 pl., deictic, dem. pl. (541 + P₂p + 712).

Prefixes 610 occur word initially and adjacent to the stem in all of their occurrences: 610 + S... (see 4.2.). Example: ʔámaʔi right over there (612 + S₁ + 711).

Suffixes 710 occur word finally and adjacent to the stem in all their occurrences: ...S, P + 710 (see 4.1. and 4.2.). Examples: ʔá·čim̩ 1 pl., deictic, dem. pl. (541 + P₁p + 712); ʔí·yaʔa right over here (611 + S₅ + 711).

Suffixes 810 occur word finally and adjacent to the stem in all occurrences: Q + 810 (see 4.3.). Example: gó·k̩pa in two places (Q₂ + 812).

The following sections give the inventories of each of the minor stem classes together with sequences in which members of each class combine with affixes.

4.1. The present section treats morpheme sequences in which members of the minor stem class P(ronoun) (five members) occur in combination with affixes and sequences in which they co-occur with members of V. The inventory of members of P is as follows: P₁s $\text{p̩} \sim \text{n̩}$ 1 sg.; P₂s p̩ 2 sg.; P₁p čI 1 pl.; P₂p $\text{m̩} \sim \text{-pi-}$ 2 pl.; P₃sp $\text{h̩gA} \sim \text{gA} \sim \emptyset$ 3 non-specified number (see 2.2.14, for distribution of multiple alternants).

Affixes which combine with members of P are those showing index numbers 500, 700, and 10, 30. Of these, affixes 500 are exclusively associated with P and are diagnostic thereof. Any member of P may combine with any of the affixes 500.

According to their combination with suffixes 700, members of P fall into three subclasses. P_s labels a subclass of P whose members (P_{1s} and P_{2s}) may combine with 711 demonstrative deictic, singular and are incompatible with 712 demonstrative deictic, plural. P_p labels a subclass of P whose members (P_{1p} and P_{2p}) may combine with 712 demonstrative deictic, plural and are incompatible with 711 demonstrative deictic, singular. P_{sp} labels a subclass whose single member (P_{3sp}) may combine with either of the suffixes 710 demonstrative deictic. All members of P may occur unaffixed.

Sequences in which members of P combine with affixes 541 personal deictic, 711 demonstrative deictic, singular, and 712 demonstrative deictic, plural are presented in three formulae below.

(1) + 541 + P_{1,2s} ± 711:

ʔá·pí 1 sg., deic. (541 + P_{1s}); ʔá·piʔi 1 sg. deic., dem. sg. (541 + P_{1s} + 711).

ʔá·pí 2 sg., deic. (541 + P_{2s}); ʔá·piʔi 2 sg. deic., dem. sg. (541 + P_{2s} + 711).

(2) + 541 + P_{1p} ± 712; + 541 + P_{2p} + 712 (in combination with 541, P_{2p} is always followed by 712):

ʔá·čí 1 pl., deictic (541 + P_{1p}); ʔá·čimí 1 pl., deic., dem. pl. (541 + P_{1p} + 712).

$\text{?á}^\circ\text{pim}^\ddagger$ 2 pl. deic., dem. pl. (541 + $\underline{P}_2\text{p}$ + 712).

(3) + 541 + $\underline{P}_3\text{sp}$ + 710:

$\text{h}^\ddagger\text{g}^\ddagger$ 3 non-specified number, deic. (541 + $\underline{P}_3\text{sp}$);

$\text{h}^\ddagger\text{gam}^\ddagger$ 3 non-sp. no. deic., dem. pl. (541 + $\underline{P}_3\text{sp}$ + 712);

$\text{h}^\ddagger\text{ga}^\circ\text{i}$ 3 non-sp. no. deic., dem. sg. (541 + $\underline{P}_3\text{sp}$ + 711).

The remaining discussion of members of \underline{P} is divided into two subsections below. Subsection 4.1.1. treats sequences in which members of \underline{P} occur in combination with affixes 510, 520, and 530; subsection 4.1.2. treats sequences, longer than a single word, in which \underline{Pw} (a sequence including \underline{P} plus one or more of the affixes 510, 520, 530) co-occurs with \underline{Vw} (a member of \underline{V} plus-minus certain affixes).

4.1.1. All members of \underline{P} may combine with affixes 510, 520, and 530 in sequences of the types $\pm 510 + 520 + \underline{P} \pm 530$ and $\underline{P} \pm 530$. Sequences of these types are always followed, in the case of those beginning in 510 or \underline{P} , by a member of \underline{V} plus-minus certain affixes, or either preceded or followed, in the case of those beginning in 520, by a member of \underline{V} plus-minus certain affixes (see 4.1.2.).

In the following paragraphs, the combination of members of \underline{P} with affixes 510, 520, and 530 is exemplified fully.

(1) $\pm 510 + 520 + \underline{P} \pm 530$:

?an^\ddagger 1 sg., nonspecified mode (521 + $\underline{P}_1\text{s}$); $\text{?an}^\ddagger\text{id}^\ddagger$ 1 sg. nonsp. mode, nonpresent (521 + $\underline{P}_1\text{s}$ + 531); man^\ddagger 1 sg., subjunctive (511 + 521 + $\underline{P}_1\text{s}$); $\text{man}^\ddagger\text{id}^\ddagger$ 1 sg., subj. nonpres. (511 + 521 + $\underline{P}_1\text{s}$ + 531); nan^\ddagger 1 sg., interrogative (512 + 521 + $\underline{P}_1\text{s}$); $\text{nan}^\ddagger\text{id}^\ddagger$ 1 sg., inter., nonpres. (512 + 521 +

$\underline{P}_1s + 531$); $kup\dot{\iota}$ 1 sg., intro. ($513 + 521 + \underline{P}_1s$);
 $kun\dot{\iota}d\dot{\iota}$ 1 sg., intro., nonpres. ($513 + 521 + \underline{P}_1s + 531$).

$\text{?}ap\dot{\iota}$ 2 sg., nonsp. mode ($521 + \underline{P}_2s$); $\text{?}ap\dot{\iota}t\dot{\iota}$ 2 sg., nonsp. mode, nonpres. ($521 + \underline{P}_2s + 531$); $map\dot{\iota}$ 2 sg., subj. ($511 + 521 + \underline{P}_2s$); $map\dot{\iota}t\dot{\iota}$ 2 sg., subj., nonpres. ($511 + 521 + \underline{P}_2s + 531$); $napi\dot{\iota}$ 2 sg., inter. ($512 + 521 + \underline{P}_2s$); $napi\dot{\iota}t\dot{\iota}$ 2 sg., inter., nonpres. ($512 + 521 + \underline{P}_2s + 531$); $kup\dot{\iota}$ 2 sg., intro. ($513 + 521 + \underline{P}_2s$); $kup\dot{\iota}t\dot{\iota}$ 2 sg., intro., nonpres. ($513 + 521 + \underline{P}_2s + 531$).

$\text{?}a\check{c}\dot{\iota}$ 1 pl., nonsp. mode ($521 + \underline{P}_1p$); $\text{?}at\dot{\iota}t\dot{\iota}$ 1 pl., nonsp. mode ($521 + \underline{P}_1p + 531$); $ma\check{c}\dot{\iota}$ 1 pl., subj. ($511 + 521 + \underline{P}_1p$); $mat\dot{\iota}t\dot{\iota}$ 1 pl., subj., nonpres. ($511 + 521 + \underline{P}_1p + 531$); $na\check{c}\dot{\iota}$ 1 pl., inter. ($512 + 521 + \underline{P}_1p$); $nat\dot{\iota}t\dot{\iota}$ 1 pl., inter., nonpres. ($512 + 521 + \underline{P}_1p$); $ku\check{c}\dot{\iota}$ 1 pl., intro. ($513 + 521 + \underline{P}_1p$); $kut\dot{\iota}t\dot{\iota}$ 1 pl., intro., nonpres. ($513 + 521 + \underline{P}_1p + 531$).

$\text{?}am\dot{\iota}$ 2 pl., nonsp. mode ($521 + \underline{P}_2p$); $\text{?}am\dot{\iota}t\dot{\iota}$ 2 pl., nonsp. mode, nonpres. ($521 + \underline{P}_2p + 531$); $mam\dot{\iota}$ 2 pl. subj. ($511 + 521 + \underline{P}_2p$); $mam\dot{\iota}t\dot{\iota}$ 2 pl., subj., nonpres. ($511 + 521 + \underline{P}_2p + 531$); $nam\dot{\iota}$ 2 pl., inter. ($512 + 521 + \underline{P}_2p$); $nam\dot{\iota}t\dot{\iota}$ 2 pl., inter., nonpres. ($512 + 521 + \underline{P}_2p + 531$); $kum\dot{\iota}$ 2 pl., intro. ($513 + 521 + \underline{P}_2p$); $kum\dot{\iota}t\dot{\iota}$ 2 pl., intro., nonpres. ($513 + 521 + \underline{P}_2p + 531$).

$\text{?}o\text{-}\emptyset$ 3 nonsp. no., nonsp. mode ($521 + \underline{P}_3sp$);
 $\text{?}a\text{-}\emptyset\text{-}t\dot{\iota}$ 3 nonsp. no., nonsp. mode, nonpres. ($521 + \underline{P}_3sp + 531$); $mo\text{-}\emptyset$ 3 nonsp. no., subj. ($511 + 521 + \underline{P}_3sp$);
 $ma\text{-}\emptyset\text{-}t\dot{\iota}$ 3 nonsp. no., subj., nonpres. ($511 + 521 + \underline{P}_3sp + 531$);

no'- \emptyset 3 nonsp. no., inter. (512 + 521 + P₃sp); na- \emptyset -t \ddot{i}
3 nonsp. no. inter., nonpres. (512 + 521 + P₃sp + 531);
ku- \emptyset 3 nonsp. no., intro. (513 + 521 + P₃sp); ku- \emptyset -t \ddot{i}
3 nonsp. no., intro., nonpres. (513 + 521 + P₃sp + 531).

(2) + P + 531:

n \ddot{i} d \ddot{i} 1 sg., nonpres. (P₁s + 531); p \ddot{i} t \ddot{i} 2 sg., non-
pres. (P₂s + 531); t \ddot{i} t \ddot{i} 1 pl., nonpres. (P₁p + 531);
m \ddot{i} t \ddot{i} 2 pl., nonpres. (P₂p + 531); \emptyset -t \ddot{i} 3 nonsp. no., non-
pres. (P₃sp + 531).

Sequences in which members of P combine with prefixes 10, 30 are of the following types: (1) \ddot{t} 11 + 31 + 521 + P₅sp \ddot{t} 531; (2) \ddot{t} 11 + 32 + 521 + P \ddot{t} 531. Sequences of this type in which 11 s \ddot{i} - intensive is present are always immediately followed by a member of V subclass tr V sp in plus-minus certain affixes according to their co-occurrence with P plus affix(es) (see 4.1.2.). Sequences of this type in which 11 is absent and in which 30 is present are always followed immediately by a member of one of the subclasses tr, double tr V p, sp, spp plus-minus certain affixes according to their co-occurrence with P plus affix(es) (see 4.1.2.). As examples of sequences of this type, we cite the following.

s \ddot{i} h \ddot{a} [?]a \ddot{n} \ddot{i} d \ddot{i} \downarrow haw \ddot{i} p \ddot{i} a # I have ruined them. (11 + 32 +
521 + P₁s + 531 32 + 53 + tr V_{1a}sp in).

s \ddot{i} [?] \ddot{i} [?] \ddot{i} - \emptyset \downarrow w \ddot{i} \ddot{i} h \ddot{i} m \ddot{i} # It is getting ruined. (11 + 31 +
521 + P₃sp tr V_{1a}sp in + 131).

h \ddot{a} [?]a \ddot{n} \ddot{i} d \ddot{i} \downarrow h \ddot{a} h \ddot{a} h \ddot{a} i # I have broken them. (32 + 521 +
P₁s + 531 32 + 51 + tr V₃spp + 111).

4.1.2. In subsection 4.1.1. above, sequences in which members of P combine with affixes are treated. In the present subsection, we treat sequences in which members of P plus one or more of the affixes 510, 520, 530 co-occur with members of V and with affixes which combine with V. That is, we treat morpheme sequences longer than a single word and in which a co-occurring pair of morphemes is a member of P and a member of V; such a sequence is hereinafter termed a PRONOUN-VERB PHRASE. A pronoun-verb phrase always includes a member of P plus one or more of the affixes 510, 520, 530 (a sequence hereinafter termed a PRONOUN WORD and symbolized as Pw) and a member of V plus-minus one or more affixes according to their co-occurrence with P plus affix(es) (a sequence termed VERB WORD and symbolized as Vw).

Within each of the obligatory parts (Pw and Vw) of a pronoun-verb phrase, there are morphemes having reference to one or more of the categories of tense, aspect, mode, person, and number. The following subsections treat the co-occurrence, within the pronoun-verb phrase, of morphemes having reference to tense-aspect (4.1.2.1.) and of morphemes having reference to person-number (4.1.2.2.). Morphemes having reference to mode, 510 and 520, are not relevant to the co-occurrence of morphemes within the pronoun-verb phrase, being relevant rather to the co-occurrence of the pronoun-verb phrase itself in frames larger than a single phrase. The presence or absence of 510 and 520 is relevant, however, to the discussion of the relative order position of each of the obligatory constituents

in the pronoun-verb phrase.

In a given pronoun-verb phrase, Pw may or may not be contiguous to Vw. Certain specific Pw may either precede or follow Vw; certain Pw always precede Vw. Those Pw in which the first morpheme is 510, 10, 30, or P (i.e., 510 + 521 + P...; ± 10 + 30 + 521 + P...; P + 531) always stand before Vw. Examples: nap± ↓ číkípaní # Are you working? (512 + 521 + P_{2s} intr V_{3sp}); haʔanídí ↓ haháhai # I have broken them. (32 + 521 + P_{1s} + 531 32 + 51 + tr V_{3spp} + 111); nid o· mi ↓ níi # I'll be seeing you. (P_{1s} + 531 X_{fut} 42 + tr V_{3sp} + 111). Those Pw in which 10 and/or 30 is present are always contiguous to Vw, while those beginning in 510 or P may or may not be contiguous to Vw (see examples above). Those Pw in which the first morpheme is 521 (i.e., 521 + P ± 531) may either precede or follow Vw. If they precede Vw they may or may not be contiguous thereto; if they follow, they are always contiguous to Vw. Examples: ʔaní ↓ číkípaní # I am working. (521 + P_{1s} intr V_{3sp}); číkípaní ʔaní # I am working. (intr V_{3sp} 521 + P_{1s}).

In the following subsections, certain examples include one or more particles (morphologically free morphemes which always occur unaccompanied by affixes). Particles are symbolized as X (with subscript abbreviations of their meanings) in the morphemic breakdowns following examples. Example: X_{fut} wo· ~ o· future occurring in nid o· ↓ nío # I will speak. (P_{1s} + 531 X_{fut} intr V_{3spp} + 111).

4.1.2.1.. The present subsection treats the co-occurrence of morphemes included in Pw and Vw which have reference to tense-aspect. Specifically, we treat the co-occurrence of the morphemes 531 personal non-present (combining with P), and 53 continuative 54 momentaneous, 111 non-present, 131 progressive, 141 durative (combining with members of V).

Suffix 531 -ti~-di personal non-present is incompatible with 131 progressive (in the same pronoun-verb phrase). In sequence with members of V₁ (i.e., in a pronoun-verb phrase in which 531 and a member of verb subclass V₁ are present), 531 obligatorily co-occurs with one of the affixes 53 continuative, 111 non-present, or 141 durative. In sequence with V₂, 531 obligatorily co-occurs with the affix pair 54 momentaneous and 111 non-present or with the suffix 141 durative. In sequence with members of V₃, 531 obligatorily co-occurs with one of the suffixes 111 non-present, or 141 durative. In sequence with stative V, 531 obligatorily co-occurs with 141, and in sequence with att V, 531 is incompatible with suffixes (i.e., in sequence with 531, members of att V must be unaccompanied by suffixes).

In a pronoun-verb, 53 continuative may or may not co-occur with 531 personal non-present. Suffixes 111 non-present and 141 durative obligatorily co-occur with 531. Suffix 131 progressive is incompatible with 531. Members of att V, unaccompanied by 131, obligatorily co-occur with 531.

Those Pw in which 531 is present are labeled Pw non-present; those Pw in which 531 is absent are labeled Pw present.

Those Vw which may co-occur, in the same pronoun-verb phrase, with Pw non-present are listed in formulae below. In the formulae, three dots (...) stand for morphemic material which is irrelevant to the co-occurrence treated here; the notation () refers to the relationship of co-occurrence without reference to sequence order of the elements involved in the co-occurrence. Five formulae are listed below for co-occurrence of Vw with Pw non-present; each formula is supplied with one or more examples.

(1) ...P + 531 () ... + 53 + V₁ + 141:

wápiḡa· ʔanɛdɛ ḡɛ ↓ tóki· † I irrigated the cotton.

(53 + tr V_{1b}sp 521 + P_{1s} + 531 P_{3sp} al N s).

nɛd a pi s o· wa ʔi ha ↓ sásɛda·dɛ † I will keep on herding them. (P_{1s} + 531 X_{ref} X_{dub} X_{quot} X_{fut} X_{ref} X_{term} 32 + 53 + tr V_{1b}sp + 141). The particle sequence X_{ref} wa~a referential + X_{dub} pi dubitative + X_{quot} sɛ quotative + X_{fut} wo·~o· future + X_{ref} wa~a referential + X_{term} ʔi terminative is a frequently recurring particle cluster translated in all its occurrences as to keep on (verbing); in most of its occurrences, this particle cluster co-occurs with 141 durative.

napɛt o· ↓ ná·nɛda· † Are you going to build a fire ?

(512 + 521 + P_{2s} + 531 X_{fut} 53 + tr V_{1b}sp).

(2) ...P + 531 () ... + 54 + V₂ + 111, 141:

napɛt o· ↓ ʔɛ́·ʔɛ́ † Are you going to smoke ? Would you like a smoke ? (512 + 521 + P_{2s} + 531 X_{fut} 54 + tr V₂sp + 111).

níd a p̄i s̄ ō wa ?i ha ↓₃í·₃inadí # I will keep on smoking them. (P₁s + 531 X_{ref} X_{dub} X_{quot} X_{fut} X_{ref} X_{term} 32 + 54 + tr V₂sp + 141).

níd ō ↓ wó·p̄i ḡi ↓ čúčulí # I will pluck the chicken.
(P₁s + 531 X_{fut} 54 + tr V₂sp + 111 P₃sp al N s).

(3) ...P + 531 () ...V_{1,3} + 111, 141:

níd ō ↓ čík̄ip̄i # I will work, I am going to work.

(P₁s + 531 X_{fut} intr V₃sp + 111).

∅-t ō ↓ níokadí # He will be talking. (P₃sp + 531 X_{fut} intr V₃spp + 141).

ḡi· ?ap̄it̄i ki # You have apparently put on a little weight. (intr V_{1a}sp + 111 521 + P₂s + 531 X_{evid}).

nat̄it ō ↓ sá·dad̄i # Are we going to keep herding ?

(512 + 521 + P₁p + 531 X_{fut} tr V_{1b}sp + 141).

(4) ...P + 531 () ...att V:

∅-t̄i ki o ↓ túha· # It is apparently going to get white.

(P₃sp + 531 X_{evid} X_{fut} att V sp).

móika· ?a-∅-t̄i # It got soft. (att V sp 521 + P₃sp + 531).

(5) ...P + 531 () stative V + 141:

nap̄it̄i ↓ ?i a p̄i s̄ ō wa ?i dá·kad̄i ↓ ?í·ya[?]a # Are you going to stay (keep on sitting) here ? (512 + 521 + P₂s + 531 S₅ X_{ref} X_{dub} X_{quot} X_{fut} X_{ref} X_{term} stative V s + 141 611 + S₅ + 711).

Those Vw which may co-occur with Pw present (...P unaccompanied by 531 personal non-present) are listed and exemplified in three paragraphs below.

(1) ... P () ... ± 53 + V₁ ± 131:

máihimí ʔo·-∅ # It is burning. (intr V_{1a} sp + 131
521 + P₃ sp).

ʔani ha ↓ sásida· # I am herding them. (521 + P₁ s
32 + 53 + tr V_{1b} sp).

ʔíʔi ʔo·-∅ # He is drinking. (tr V_{1a} sp 521 + P₃ sp).

wápiḡa·himí ʔani # I have been irrigating. (53 +
tr V_{1b} sp + 131 521 + P₁ s).

(2) ... P () ... V_{1,2,3} ± 131:

číkípaní ʔáčí # We are working. (intr V₃ sp 521 +
P₁ p).

číkípanahimí ʔo·-∅ # He has been working (intr V₃ sp +
131 521 + P₃ sp).

wí·ni ʔo·-∅ ḡí ↓ wihogí # He is sucking the mesquite
bean. (tr V₂ sp 521 + P₃ sp P₃ sp al N s).

ʔí·nihimí ʔo·-∅ # He has been smoking. (tr V₂ sp +
131 521 + P₃ sp).

(3) ... P () ... att, stative V + 131:

móika·himí ʔo·-∅ # It is getting soft. (att V sp +
131 521 + P₃ sp).

ʔamí ʔo·-∅ ↓ ká·kahimí # It has been standing there.
(612 + S₁ 521 + P₃ sp stative V s + 131).

4.1.2.2. This subsection treats the co-occurrence, with-
in a pronoun-verb phrase, of morphemes included in Pw and Vw
which have reference to the categories of person and number.

Of the morphemes included in Vw, the verb stem (sub-
class based on combination with 30, 40 goal, 51 plural, 52

distributive, etc., see 3.1.), and the affixes 30, 40 goal, 51 plural, have reference to person and number. The reduplicative 52 distributive is also relevant to the discussion of number in pronoun-verb phrases in which Vw includes a member of att V. Of the morphemes included in Pw, the pronoun stem (P_{1,2}s, p, P₃sp, see 4.1.2.1.) has reference to the categories of person and number.

The immediately following paragraphs treat the co-occurrence of members of P with members of the various subclasses of intr V (for the definition of which, see 3.1.2.).

P_{1,2}s (first or second person singular, actor) may co-occur with intr V s, intr V sp, and intr V spp and are incompatible with intr V p. In sequence with intr V spp they are incompatible with 51 plural.

P_{1,2}p (first or second person plural, actor) may co-occur with intr V p, intr V sp, and intr V spp, and they are incompatible with intr V s. In sequence with members of intr V spp, they obligatorily co-occur with 51 plural.

P₃sp (third person non-specified number, actor) may co-occur with intr V s, p, sp, spp. In sequence with intr V spp, it may or may not co-occur with 51 plural.

The relationships of co-occurrence stated above are expressed in four formulae below. Each formula is followed by its scope (meaning) in parentheses.

- (1) ...P_{1,2}s, P₃sp... () ...intr V s, intr V spp...
(single actor performs an intransitive action):

nãd o• ?i ↓ dã° # I am going to jump. (P_{1s} + 531
X_{fut} X_{term} intr V_{1a}s + lll).

napít o• ↓ mǎ° # Are you going to run ? (512 + 521 +
P_{2s} + 531 X_{fut} intr V_{1b}s + lll).

?u?uhigǎ ?at o• # dã° # The bird is going to fly.
 (al N s 521 + P_{3sp} + 531 X_{fut} intr V_{1a}s + lll).

níokǎ ?o•-∅ # He is speaking. (intr V_{3spp} 521 +
P_{3sp}).

nãd o• ↓ nío # I am going to speak. (P_{1s} + 531
X_{fut} intr V_{3spp} + lll).

napít o• ↓ kói # Are you going to sleep ? (512 + 521 +
P_{2s} + 531 X_{fut} intr V_{1b}spp + lll).

(2) ...P_{1,2p}, P_{3sp}... () ...intr V p... (plural
 actors perform an intransitive action):

wópo• ?očǎ # We are running. (53 + intr V_{1a}p
 521 + P_{1p}).

namít o• ?i ↓ nǎ°nǎ° # Are you (pl.) going to jump ?
 (512 + 521 + P_{2p} + 531 X_{fut} X_{term} intr V_{1a}p + lll).

?u?uhigǎ ?a-∅-t o• ↓ nǎ°nǎ° # The birds are going to
fly. (al N s 521 + P_{3sp} + 531 X_{fut} intr V_{1a}p).

(3) ...P_{1,2s}, p, P_{3sp}... () ... intr V sp... (single
 (plural) actor(s) perform an intransitive action):

napít o• ↓ číkǎpǎ # Are you going to work ? (512 +
 521 + P_{2s} + 531 X_{fut} intr V_{3sp} + lll).

nemit o• ↓ číkǎpǎ # Are you (pl.) going to work ?
 512 + 521 + P_{2p} + 531 X_{fut} intr V_{3sp} + lll).

$\check{c}ik\acute{i}pan\acute{i}$ $ʔa\check{c}\acute{i}$ † We are working. (intr V₃sp 521 + P₁p).

gi $ʔan\acute{i}d\acute{i}$ † I got fat. (intr V_{1a}sp + 111 521 + P₁s + 531).

\emptyset -t o \downarrow $n\acute{i}$ † He (they) will sing. (P₃sp + 531 X_{fut} intr V_{1a}sp + 111).

(4) ...P_{1,2}p, P₃sp... () ...51 + intr V spp...

(plural actors perform an intransitive action; plural actor is redundantly marked):

t\acute{i}t o \downarrow $n\acute{i}$ no † We will speak. (P₁p + 531 X_{fut} 51 + intr V₃spp + 111).

$n\acute{a}m\acute{i}t$ o \downarrow $k\acute{o}$ $k\acute{i}$ † Are you (pl.) going to sleep ?
(512 + 521 + P₂p + 531 X_{fut} 51 + intr V_{1b}spp + 111).

$w\acute{i}piot\acute{i}$ $ʔo$ - \emptyset † They are vomiting. (51 + intr V₃spp 521 + P₃sp).

The immediately following paragraphs treat the co-occurrence of members of P with the prefixes 30, 40 goal in sequence with members of the various subclasses of tr V or double tr V (see 3.1.2.).

In sequence with tr V or double tr V, P₁s (first person singular, actor) may co-occur with 32 3 pl. goal, 41 1 sg. goal, 42 2 sg. goal, and 44 2 pl. goal and is incompatible with 31 non-1 reflexive and 43 1 pl. goal. In sequence with tr V or double tr V, P₁p (first person plural, actor) may co-occur with 32, 43, 44 and is incompatible with 31 and 41.

In sequence with tr V or double tr V, P₂s, p (second person singular or plural, actor) may co-occur with 30, 41,

and 43 and are incompatible with 42 and 44.

P₃sp (third person non-specified number, actor) may co-occur with any of the prefixes 30, 40 goal in sequence with tr V or double tr V.

Examples of sequences in which members of P co-occur with prefixes 30, 40 goal are listed in four sets of formulae below.

(1) ...P₁s... () 32, 41, 42, 44 ...tr V...; ...P₁s...

() ± 32 ± 41, 42, 44 ...double tr V...:

ha[?]anid[±] ↓ haháhai # I have broken them. (32 + 521 + P₁s + 531 32 + 51 + tr V₃spp + 111).

pi[?] inid[±] ki o n[±] ↓ mái # I can't seem to figure it out. (X_{neg} 521 + P₁s + 531 X_{evid} X_{fut} 41 + tr V_{1b}sp + 111).

n[±]d o[?] i ham[±] ↓ wáp[±]koj[±] # I will wash them for you. (P₁s + 531 X_{fut} X_{term} 32 + 42 + 51 + double tr V₃spp + 111).

man[±] ha[?]im[±] ↓ m[±]s[±]čam[±] # I am teaching you some. (511 + 521 + P₁s 32 + 44 + double tr V₃sp).

(2) ...P₁p... () 32, 42, 43, 44 ...tr V...; ...P₁p...

() ± 32 ± 42, 43, 44 ...double tr V...:

?úí g[±] t[±]t o[?] t[±] ↓ mó[?] n[±]d[±] # Let's play cards ! (X_{imm} X_{hort} P₁p + 531 X_{fut} 43 + tr V₃sp + 111).

?ač[±] m[±] ↓ n[±]id[±] # We see you. (521 + P₁p 42 + tr V₃sp).

t[±]t o[?] ha[?]im[±] ↓ wáp[±]koj[±] # We will wash them for you. (P₁p + 531 X_{fut} 32 + 44 + + 51 + double tr V₃spp + 111).

(3) ...P₂s, p... () 30, 41, 43 ...tr V...; ...P₂s, p...
 () ± 32 ± 41, 43 ...double tr V...:

nap±t± ha↓nái # Did you see them ? (512 + 521 +
P₂s 32 + tr V₃sp + lll).

nam±↓?ímásičam± # Are you going to school (teaching
 yourselves) ? (512 + 521 + P₂p 31 + double tr V₃sp).

pít o° han±↓má° g±↓lú°līsi° # You will give me some
 candy. (P₂s + 531 X_{fut} 32 + 41 + double tr V_{1b}sp + lll
P₃sp al N s).

mam±t o° t±↓gígosi± # You (pl.) will feed us. (511 +
 521 + P₂p + 531 X_{fut} 43 + tr V₃sp + lll).

(4) ...P₃sp... () 30, 40 ...tr V...; ...P₃sp () ±
 32 ± 40 ...double tr V...:

náikíi ?a-ø-t± g±↓mú°wal± # The bee stung me. (41 +
tr V₃sp + lll 521 + P₃sp + 531 P₃sp al N sp).

ø-t o° t±↓₃úkísi± # It will rain on us. We will get
 some rain. (P₃sp + 531 X_{fut} 43 + tr V₃sp + lll).

na-ø-t± ?ím±↓₃úkísi± # Did it rain on you (pl.)?
 (512 + 521 + P₃sp + 531 44 + tr V₃sp + lll).

na-ø-t± ham±↓má° g±↓lial± # Did he give you some money ?
 (512 + 521 + P₃sp + 531 32 + 42 + double tr V_{1b}sp + lll
P₃sp al N s).

na-ø-t± ↓?íku° g±↓čían±da° # Did the store close
 (itself)? (512 + 521 + P₃sp + 531 31 + tr V_{1b}spp + lll P₃sp
 al N sp).

Sequences in which members of P co-occur with members
 of stative V and att V are treated below. Those stative V

which may co-occur with P s or P sp and are incompatible with P p are labeled stative V s. Members of stative V which may co-occur with P p and with P sp and are incompatible with P s are labeled stative V p; stative V which may co-occur with any P are labeled stative V sp, and those which may combine with 51 plural are labeled stative V spp.

P_{1,2}s (first or second person singular, actor) may co-occur with stative, att V s, stative, att V sp, stative V spp, and att V sd; they are incompatible with stative V p and with the affixes 51 plural and 52 distributive.

P_{1,2}p (first or second person plural, actor) may co-occur with stative V p, stative, att V sp, stative V spp, and att V sd; they are incompatible with stative V s. In sequence with att V sp or stative V spp, P_{1,2}p obligatorily co-occur with 51 plural; in sequence with att V sd, they obligatorily co-occur with 52 distributive.

P₃sp (third person non-specified number, actor) may co-occur with any stative V or att V. It may or may not co-occur with 51 plural in sequence with stative V spp or att V sp and with 52 distributive in sequence with att V sd.

Examples of sequences in which members of P co-occur with members of stative V and att V are presented in three formulae below.

(1) ...P_{1,2}s... () ...stative, att V s...; ...stative, att V sp..., ...stative V spp..., ...att V sd...:

nid ?i a pi s o wa ?i dá·kadí † I will stay (keep on sitting) here. (P₁s + 531 S₅ X_{ref} X_{dub} X_{quot} X_{fut}

$\underline{X}_{ref} \underline{X}_{term}$ stative V spp).

napit↓ ?i a pi s o· wa ?i ki·kadiz ↓ ?i·ya? a# Are you going to keep on living here ? (512 + 521 + \underline{P}_2s + 531

$\underline{S}_5 \underline{X}_{ref} \underline{X}_{dub} \underline{X}_{quot} \underline{X}_{fut} \underline{X}_{ref} \underline{X}_{term}$ stative V sp).

?apiti ↓ ?i gi?ida·# You have gotten big. (521 + \underline{P}_2s + 531 \underline{X}_{term} att V sd).

giwika· ?anidi# I have gotten strong. (att V sp 521 + \underline{P}_1s + 531).

(2) ... $\underline{P}_{1,2p}$... () ...stative V p..., ...stative V sp..., ...51 + stative V spp..., ...51 + att V sp..., ...52 + att V sd...:

natiti ↓ ?i a pi s o· wa ?i gi·gokadiz# Are we going to keep on standing here ? (512 + 521 + \underline{P}_1p + 531 $\underline{S}_5 \underline{X}_{ref} \underline{X}_{dub} \underline{X}_{quot} \underline{X}_{fut} \underline{X}_{ref} \underline{X}_{term}$ stative V p).

namiti ↓ ?i a pi s o· wa ?i da·dihakadiz ↓ ?i·ya? a# Are you (pl.) going to stay (keep on sitting) here ? (512 + 521 + \underline{P}_2p + 531 $\underline{S}_5 \underline{X}_{ref} \underline{X}_{dub} \underline{X}_{quot} \underline{X}_{fut} \underline{X}_{ref} \underline{X}_{term}$ 51 + stative V spp).

?aci ?ami ↓ ki·kahimz# We have lived there (used to live there). (521 + \underline{P}_1p 612 + \underline{S}_1 stative V sp + 131).

giwipika· ?amiti ki# You (pl.) have apparently gotten strong. (51 + att V sp 521 + \underline{P}_2p + 531 \underline{X}_{evid}).

ci?ciwida·himz ?aci# We are getting tall. (52 - att V sd + 131 521 + \underline{P}_1p).

(3) ... \underline{P}_3sp ... () ...stative, att V..., ...51 + stative V spp..., ...51 - att V sp..., ...52 + att V sd...:

na-Ø-ti ↓ ?i a pi s o· wa ?i ki·kadiz# Should it stay

here ? (512 + 521 + P₃sp + 531 S₅ X_{ref} X_{dub} X_{quot}
X_{fut} X_{ref} X_{term} stative V s).

móika· ?a-ø-ti gi ↓ ʔ₃íwidi # The ground got soft.

(att V sp 521 + P₃sp + 531 P₃sp al N sp).

dádihakahimí ?o-ø # They have been sitting. (51 +
stative V spp + 131 521 + P₃sp).

káwipika·himí ?o-ø # They are getting hard. (51 +
att V sp + 131 521 + P₃sp).

śáʔasíwaḍika·himí ?o-ø ki gi ↓ wipiḥina· # The
ropes are apparently getting thicker . (52 + att V sd + 131
 521 + P₃sp X_{evid} P₃sp 51 + inal N sp).

4.2. Sequences in which members of the minor stem class S(patial) (five members) occur in combination with affixes are treated in this section. The inventory of members of S is as follows: S₁ mī there₁ (away from speaker), at; S₂ nī there₂ (neither to nor away from speaker), on; S₃ bī there₃ (toward speaker), against; S₄ dī~dA there₄ (general spatial-temporal), in, then, this, who; S₅ ?i~y~a here.

Affixes with which members of S combine are those showing index numbers 600 and 700. Of these, prefixes 600 are exclusively associated with S. Minor stems S represent an aggregate class of whose members, no two have identical distribution in terms of combination with affixes. Of the affixes which combine exclusively with members of S, none is diagnostic; i.e., century 600 includes no prefix with which all members of S may combine.

All members of S may occur unaccompanied by affixes.

Sequences in which each of the members of \underline{S} combines with affixes are given in separate paragraphs below.

Affixes which combine with \underline{S}_1 are 611, 612, 613, and 711. Sequences in which \underline{S}_1 combines with these affixes are included in the single formula (1) below.

(1) + 611, 612, 613 + \underline{S}_1 ± 711:

?im± there₁ proximal (611 + \underline{S}_1); ?i'·ma?a there₁ proximal, dem. (611 + \underline{S}_1 + 711); ?am± there₁ distal (612 + \underline{S}_1); ?'ama?i there₁ distal, dem. (612 + \underline{S}_1 + 711); g±m± there₁ ultradistal (613 + \underline{S}_1); g'ama?i there₁ ultradistal, dem. (613 + \underline{S}_1 + 711).

Affixes with which \underline{S}_2 combines are 611, 612, 613, and 711 (but in slightly different sequences from those in which \underline{S}_1 occurs). Sequences in which \underline{S}_2 combines with these affixes are included in the formulae (1,2) below.

(1) + 611, 612 + \underline{S}_2 ± 711:

?in± there₂ proximal (611 + \underline{S}_2); ?i'·na?a there₂ proximal, dem. (611 + \underline{S}_2 + 711); ?an± there₂ distal (612 + \underline{S}_2); ?'ana?i there₂ distal, dem. (612 + \underline{S}_2 + 711).

(2) + 613 + \underline{S}_2 :

g±n± there₂ ultradistal (613 + \underline{S}_2).

Affixes which combine with \underline{S}_3 are 612, 614, and 711; \underline{S}_3 combines with these affixes according to the single formula (1) below.

(1) + 612, 614 + \underline{S}_3 ± 711:

?ab± there₃ distal (612 + \underline{S}_3); ?'aba?i there₃ distal, dem. (612 + \underline{S}_3 + 711); h±b± there₃ interrogative (where)

(614 + \underline{S}_3); h**í**bai there₃ inter., dem. (614 + \underline{S}_3 + 711).

Affixes with which \underline{S}_4 combines are 610 and 710 according to the formulae (1) through (4) below.

(1) + 611 + \underline{S}_4 + 710:

?i**í**d**í** there₄ proximal (this) (611 + \underline{S}_4); ?i**í**·da?a this, dem. (611 + \underline{S}_4 + 711); ?i**í**·da**í** these, dem. pl. (611 + \underline{S}_4 + 712).

(2) + 612 + \underline{S}_4 + 711:

?i**í**d**í** there₄ distal (612 + \underline{S}_4); ?i**í**·da· there₄ distal, dem. (612 + \underline{S}_4 + 711).

(3) + 613 + \underline{S}_4 :

g**í**d**í** there₄ ultradistal (613 + \underline{S}_4).

(4) + 614 + \underline{S}_4 + 711:

h**í**d**ai** who (614 + \underline{S}_4 + 711).

Affixes with which \underline{S}_5 combines are 611, 613, and 711; sequences are listed in formulae (1,2) below.

(1) + 611 + \underline{S}_5 + 711:

?i**a** here proximal (611 + \underline{S}_5); ?i**í**·ya?a here proximal, dem. (611 + \underline{S}_5 + 711).

(2) + 613 + \underline{S}_5 :

ga beyond (613 + \underline{S}_5).

4.3. Morpheme sequences in which members of the minor stem class \underline{Q} (twelve members) combine with affixes are treated in this section. Members of \underline{Q} are listed in inventory as follows: \underline{Q}_1 h**í**maki one; \underline{Q}_2 g**ó**·k**í** two; \underline{Q}_3 w**á**ik**í** three; \underline{Q}_4 g**í**?ik**í** four; \underline{Q}_5 h**í**tas**í**p**í** five; \underline{Q}_6 **č**ú·d**í**p**í** six; \underline{Q}_7 w**í**w**í**k**í** seven;

Q_8 gígi'íkí eight; Q_9 húmugítí nine; Q_{10} wísítímá'mí ten;
 Q_{11} mú'íkí- many; Q_{12} háma·~hámi- one.

Affixes with which members of Q combine are those showing index numbers 52 and 800. Suffixes 800 are diagnostic of Q .

All members of Q may combine with suffixes 810 in sequences of the type included in the formula (1) below.

(1) + Q + 810:

hámakí one (Q_1); hámako· once, one ($Q_1 + 811$);
hámakípa· one place ($Q_1 + 812$).

gó·kí two (Q_2); góko· twice, twenty ($Q_2 + 811$);
gó·kípa· two places ($Q_2 + 812$).

wáikí three (Q_3); wáiko· thrice, thirty ($Q_3 + 811$);
wáikípa· three places ($Q_3 + 812$).

gí'íkí four (Q_4); gí'íko· four times, forty
($Q_4 + 811$); gí'íkípa· four places ($Q_4 + 812$).

hítasípí five (Q_5); hítasípo· five times, fifty
($Q_5 + 811$); hítasípípa· five places ($Q_5 + 812$).

čú·dípí six (Q_6); čú·dípó· six times, sixty
($Q_6 + 811$); čú·dípípa· six places ($Q_6 + 812$).

wíwíkí seven (Q_7); wíwíko· seven times, seventy
($Q_7 + 811$); wíwíkípa· seven places ($Q_7 + 812$).

gígi'íkí eight (Q_8); gígi'íko· eight times, eighty
($Q_8 + 811$); gígi'íkípa· eight places ($Q_8 + 812$).

húmugítí nine (Q_9); húmugíto· nine times, ninety
($Q_9 + 811$); húmugítípa· nine places ($Q_9 + 812$).

wísítimá'mi ten (Q_{10}); wísítimá'miho° ten times
 ($Q_{10} + 811$); wísítimá'mipa° ten places ($Q_{10} + 812$).
 mú'iko° many times ($Q_{11} + 811$); mú'ikipa° many
places ($Q_{11} + 812$).
 h́ima° one (Q_{12}); h́imho° once ($Q_{12} + 811$);
 h́ima°pa° one place ($Q_{12} + 812$).

Members of Q which may combine with 52 distributive
 are Q_1 through Q_{10} . In combination with Q_1 , 52 obligatorily
 co-occurs with 811; in combination with Q_2 through Q_{10} , 52 is
 incompatible with suffixes 810. Sequences in which members
 of Q combine with 52 are listed in formulae (1,2) below.

(1) $\pm 52 + Q_1 + 811$:

h́ih́imako° by ones ($52 + Q_1 + 811$).

(2) $\pm 52 + Q_2 \dots Q_{10}$:

gó'ogokí by twos ($52 + Q_2$);

wá'awaikí by threes ($52 + Q_3$);

gí'igi'ikí by fours ($52 + Q_4$);

h́í'ih́itasípí by fives ($52 + Q_5$);

čú'uču'udípí by sixes ($52 + Q_6$);

wá'páwikí by sevens ($52 + Q_7$);

gí'igi'igi° by eights ($52 + Q_8$);

h́uhumugítí by nines ($52 + Q_9$);

wí'íwí'sítimá'mi by tens ($52 + Q_{10}$).

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