Amuzgo Syllable Dynamics

Amy Bauernschmidt

Language, Vol. 41, No. 3 (Jul. - Sep., 1965), 471-483.

Stable URL:
http://links.jstor.org/sici?sici=0097-8507%28196507%2F09%2941%3A3%3C471%3AASD%3E2.0.CO%3B2-5

Language is currently published by Linguistic Society of America.

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at http://www.jstor.org/about/terms.html. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at http://www.jstor.org/journals/lsa.html.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is an independent not-for-profit organization dedicated to creating and preserving a digital archive of scholarly journals. For more information regarding JSTOR, please contact support@jstor.org.

http://www.jstor.org/
Wed Jan 18 19:13:35 2006

AMUZGO SYLLABLE DYNAMICS

AMY BAUERNSCHMIDT

Summer Institute of Linguistics

The phonological description of Amuzgo[1] will be presented in two parts. The present paper treats the syllable dynamics in relation to tones and segmental phonemes. A later paper will present an exhaustive catalog of vowel and consonant clusters.

1.1. Syllables in Amuzgo are classified as long and short, or controlled and ballistic.[2] The latter terms more accurately describe the contrastive syllable dynamics, although varying duration of voicing in the nucleus is also contrastive.

Controlled syllables are characterized by a smooth, sustained release, which continues to a peak of intensity about the mid point of the syllable nucleus, and is followed by a gradual, controlled decay. The nucleus terminates with lenis aspiration in unchecked syllables, with a lenis glottal stop in checked syllables.

Ballistic syllables are characterized by a quick, forceful release and a rapid crescendo to a peak of intensity early in the nucleus, followed by a rapid, uncontrolled decrescendo with fade of voicing. In unchecked syllables there is fortis aspiration, varying to postvelar friction after central and back vowels. In checked syllables the final glottal stop is fortis and often followed by a ballistic release, freely fluctuating from oral to nasal quality. In connected speech, the aspiration is much less apparent, if not altogether absent, particularly when the syllable is not stressed.

[1] Amuzgo is a member of the Amuzgoan family, proposed by Robert E. Longacre in his paper 'Progress in Otomanguean reconstruction', *Proceedings of the Ninth International Congress of Linguists* 1016–25 (The Hague, 1964). Amuzgo is spoken in eleven or twelve villages in southeast Guerrero and southwest Oaxaca in Mexico; there are approximately 15,000 speakers of the language, most of them monolingual. The data were collected during several field trips from 1952 to 1960. A number of informants assisted in the analysis; those who contributed most are Isaura Sebastián, Florentina López, Juan Sabino Apóstol, and his wife Victoria Valtierra de Apóstol. Genaro Santiago worked with me on the tone analysis. All are natives of the large municipio town of Xochistlahuaca, Guerrero; their dialect forms the basis for the present description.

I wrote a preliminary draft as a graduate student at the University of Michigan in 1961. I acknowledge especially the help of Kenneth L. Pike of the University of Michigan and the Summer Institute of Linguistics in checking the vowel and tone hypotheses in 1959, during a linguistic workshop in Mitla, Oaxaca, Mexico. I am also grateful to Robert E. Longacre of the Summer Institute of Linguistics for his suggestions.

[2] The terms 'ballistic' and 'controlled' are taken from Pike, *Language in relation to a unified theory of the structure of human behavior II* (Glendale, California, 1955). They are useful for describing the dynamics of the breath force in Amuzgo syllables. Another analysis which uses these terms is that of William Merrifield, 'Palantla Chinantec syllable types', *Anthropological linguistics* 5:5.1–16 (1963). The similarity of our descriptions and our use of the terms 'ballistic' and 'controlled' are the more striking as we worked simultaneously and independently.

When controlled and ballistic syllables contrast in identical environment—i.e. when each occurs stressed in a phonological foot with identical syllables preceding and following—the duration of the total nuclei is often approximately the same. Total nucleus includes the voiced components of the nucleus, plus any final aspiration due to fade of intensity, up to the onset of the following syllable: [matsəihəm-n^{y}e] 'he cuts', [matsəihə́m-n^{y}e] 'he agrees';[3] the third syllable of the first example is controlled; that of the second, marked by an acute accent, is ballistic. A stem-final syllable receives the stress. (A hyphen is used to set off suffixes from stems; hence the stressed syllable precedes a space or a hyphen.)

The contrasting dynamics of controlled and ballistic syllables are clearest in stressed syllables redundantly marked by differences of pitch allophones and of duration of voicing in the syllable nuclei. When stressed, the checked nucleus of the ballistic syllable shows minimum duration of voicing; that of the controlled syllable shows maximum duration of voicing. Although unchecked stressed syllables do not show as pronounced a contrast in this respect, here too voicing tends to be shorter in the ballistic syllable nucleus. Unstressed syllables show no consistent contrast in duration of voicing.

1.2. Amuzgo syllables are further classified by presence or absence of onset and terminus. A restricted syllable consists of a nucleus without onset or terminus; it is symbolized as +N. A second type has an onset and a nucleus but may or may not have a terminus; it is symbolized as +O+N±T.

The classification yields a total of four contrastive syllable types: +N, +Ń, +O+N±T, and +O+Ń±T—*ṇ*^{1}*ci*^{1}*ka*^{2}*no*^{nʔ2}-*ó*^{n2} 'he will erase'; *ṇ*^{1}*la*^{2}*ka*^{2}*n*^{t}*u*^{ʔ2}-*a*^{1} 'we (inclusive) will erase'; *ná*^{1}*tó*^{2} 'trail'; *ṇ*^{1}*lk*^{w}*a*^{1} 'a pod'.[4]

1.3. Syllable type +N is manifested by a syllabic consonant or by a single vowel. Syllable type +Ń is manifested only by single vowels. The onset for the other two syllable types consists of one to four consonants; the terminus is a glottal stop.[5] The nucleus consists of a single vowel or a sequence of two vowels. Voiced phonemes *m*, *n*, *n*^{y}, *n*^{t}, *n*^{ty}, and *l*, when immediately preceding the syllable nucleus and preceded in turn by one or more consonants, constitute an internal margin which is closely integrated with the nucleus. Such phonemes take part in the nuclear dynamics not only with respect to intensity and duration but with respect to the tones as well. Voiced consonants in this position therefore combine with the nucleus proper to form an expanded nucleus. In the following examples, this feature is indicated by enclosing the expanded nucleus in parentheses:

[3] Pitch details are not written in phonetic data except in the section which deals with tone.

[4] Tone is written with superscript numbers after the syllables to which they apply: ^{1} is high, ^{2} is mid, ^{3} is low. Phonetic variations are indicated by the use of plus and minus. $^{1-}$ denotes a pitch lower than the theoretical norm for high but not as low as $^{2+}$, $^{3+}$ denotes a pitch slightly higher than the theoretical norm for low, and so on. Tone sequences are indicated by superscript ^{13}, ^{32}, ^{21}.

[5] When glottal stop is final in a stressed syllable which is followed by an unstressed syllable within the phonological foot, the glottal stop may be considered to belong phonemically to the preceding syllable as terminus, or to the following syllable as onset. On the other hand, it may be considered to function as both terminus and onset, the syllable boundary being indeterminate. For the present description I have chosen to consider the glottal stop in this position to be a terminus.

[nʸ(ⁱmó)] *nʸmó*² 'wave, ripple'; [t'ʔ(má)] *tʔmá*³ 'big'; [nᴍ(mᵊæ)ʔ-ə] *nhmæʔ*¹³*-a*¹ 'our (inclusive possessive indicator of animate objects)'; [s(nᵗa)ʔ] *snᵗaʔ*¹ 'Mexico City'; [ɴʸ(nᵗʸo)ʔ] *hnᵗʸoʔ*³² 'rubber'.

1.4. The phonological foot consists of one to seven syllables, of which one is stressed. Syllables are distributed in the foot as follows: syllable types +O+N±T and +O+N̆±T occur stressed, prestressed, or poststressed; as many as five syllables occur prestressed, but only one syllable occurs poststressed, except rarely when a postclitic follows a suffix. Syllable types +N and +N̆ do not occur stressed; type +N occurs both prestressed and poststressed (usually initial when in prestressed), type +N̆ occurs only poststressed.

2.0. The syllable is the matrix for the occurrence of contrastive lexical tone. Tone phonemes do not occur in a one-to-one correlation with vowels. Rather, the tone patterns, whether single tones or sequences, extend over the entire syllable nucleus or expanded nucleus. For this reason, a phonological unit of a higher level than the vowel phoneme is necessary to describe the tone distribution. This higher unit, the syllable, remains constant regardless of the number of vowels per single tone or the number of tones per single vowel. A single tone occurs with the one or two vowels that constitute a single syllable nucleus or with an expanded nucleus without significant change in the duration or character of the nucleus: [tska²²⁻] *cka*² 'chapped skin'; [tsio²²⁻] *cio*² 'glass'; [líɑ¹¹⁻-yɔ́²] *líɑ*¹*-yɑ́*² 'my clothes'; [ɴnᵗu²²⁻] *hnᵗu*² 'bed'. Similarly, a sequence of two tones occurs on any type of syllable nucleus without significant contrast in the duration or character of the nucleus: [stó¹³] *stó*¹³ 'Aztec Indian'; [tsíəʔ¹³⁺] *cíaʔ*¹³ 'your (sing.) abdomen'; [nᴍmᵊæʔ¹²⁻-ɔ́¹³⁻] *nhmæʔ*¹³*-á*¹³ 'our (exclusive possessive indicator of animate objects)'; [šiəmʔ²¹⁻] *šioⁿʔ*²¹ 'crab'; [ɴnᵗúʔ²¹⁻] *hnᵗúʔ*²¹ 'your (sing.) bed'; [ɴnᵗᵊæ³²⁻] *hnᵗæ*³² 'countryside'.

2.1. There are three phonemic tones in Amuzgo: high, mid, and low, and three phonemic sequences of these tones within the syllable: high-low, low-mid, and mid-high. The tones are not level, but phonetically glides or contours whose beginning points are at three distinguishable levels. They differ from the tone sequences in direction or length of glide or both. (See Diagram 1.)

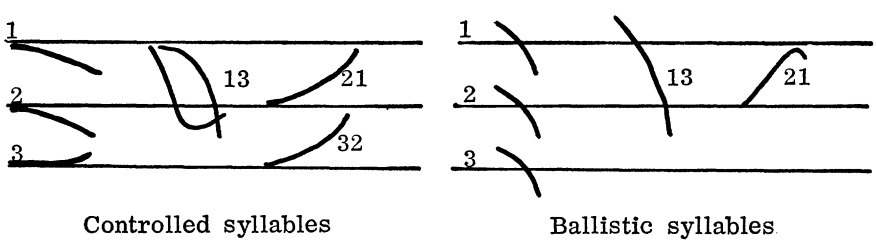

Diagram 1

The variations of pitch contour in both single tones and sequences correlate with the two syllable types, ballistic and controlled. In phonetic terms the contours are of two distinct kinds: rapid glides in ballistic syllables, and slow glides in controlled syllables. It is convenient to regard the contrastive syllable dynamics to be the conditioning factor, and the pitch variations to be a function of these.

In controlled syllables all tones (except the high-low sequence) consist of a steady rise or fall in which the total glide is distributed evenly in relation to the total duration of voicing. The high-low sequence varies in the rapidity with which the pitch falls and in the point in time when the fall begins.

In ballistic syllables all tones (except the mid-high sequence) consist of glides in which the greatest fall occurs toward the end of the voicing. The mid-high sequence consists of a rapid glide which reaches high tone late in relation to the total duration of voicing, and is followed by a slight fall. Except for the mid-high sequence, tone in ballistic syllables often begins at a slightly higher pitch than in controlled syllables.

When syllables of either type are unstressed in the foot, the extent of glides, the distance in pitch between tones, and the duration of the syllable nucleus are all greatly reduced. The presence or absence of onset does not affect the pitch characteristics of a syllable. The presence of terminus affects only the duration of the nucleus.

2.2. Since the high, mid, and low tones in controlled syllables are actualized phonetically as slow glides with the least amount of pitch change and are generally accompanied by greater duration of voicing, these three tones are more easily recognized than the tones of ballistic syllables, actualized as rapid glides of shorter duration.

Diagram 1 is a schematic representation of the tones. The three horizontal lines plot the pitch norms to which the three phonemic tones in controlled syllables are assigned. The phonemic tones and tone sequences are indicated by number, while the phonetic glides are shown as curved lines oriented to the three hypothetical levels. Where several contours appear they represent possible allophonic variations.

2.3. In stressed controlled syllables the high and mid tones have a downward-drifting pitch contour, while the low tone has a slight upward drift: [$t^{y}o^{ʔ11-}$] *$t^{y}o^{ʔ1}$* 'bread'; [$tska^{ʔ22-}$] *$cka^{ʔ2}$* 'a board'; [$n^{ty}ɔ^{33+}$] *$n^{ty}ɔ^{3}$* 'an image of a female saint'.

In the high-low sequence the fall sometimes takes place abruptly, in the first half of the nucleus. When this occurs the fall ends below mid, then rises and levels out on mid. In another variant the fall begins approximately half-way through the nucleus and falls below mid with no subsequent rise. The high-low sequence is much less frequent than other sequences, and does not occur in unstressed controlled syllables: [$t^{h}o^{ʔ13+2-}$] *$tho^{ʔ13}$* 'a span'; [$n^{t}ui^{ʔ12-}$] *$n^{t}ui^{ʔ13}$* 'coarsely woven'; [$hɔ^{n13+2-}$] *$hɔ^{n13}$* 'shadowy'.

The low-mid sequence begins low and rises smoothly toward mid. It does not always reach mid, but is more likely to do so if the tone on the following syllable is mid or high.[6] The low-mid sequence contrasts with the low tone, which has

[6] This does not imply that tones are absolute, but merely points out that the end point of a phonemic low-mid sequence may still be perceptibly lower than a following mid tone. So also, the phonemic mid-high sequence may have a perceptibly lower end point than a following high tone.

a very slight rising glide, and with the mid-high sequence, which has a contrastively higher beginning point: [N^{y}n^{ty}o$^{ʔ32-}$] *hn^{ty}oʔ*^{32} 'rubber'; [t^{h}a^{n32-}] *tha*^{n32} 'heart wood of a tree'; [lLk^{w}a$^{ʔ32-}$] *lk^{w}aʔ*^{32} 'pus'.

The mid-high sequence begins mid and rises smoothly toward high. It seldom reaches high, even when the following syllable is high: [tsui^{21-}] *cui̗*^{21} 'turtle'; [ts'ʔa^{n21-}] *cʔa*^{n21} 'tail'.

2.4. In stressed ballistic syllables the tones high, mid, and low are actualized as rapid downglides. These glides sometimes fall as far as the next lower level, but more often only to about the midway point between the two levels. In checked syllables they have an even shorter glide. If the three phonetic glides were to be considered phonemic sequences, the beginning and end of each glide would have to be equated with a phonemic level tone. This would require four level tones. By analyzing the glides as single tones and by not insisting on precise beginning and end points for them, we avoid the necessity of positing an extra tone level. Furthermore, the few contrastive tone sequences in Amuzgo lead us to posit a three-tone rather than a four-tone system: [s^{h}ɔ́$^{1+1-}$] *shɔ́*^{1} 'mountain'; [ská$^{2+2-}$] *ská*^{2} 'candle'; [n^{t}ɔ́$^{3+3-}$] *n^{t}ɔ́*^{3} 'arrow'.

The high-low sequence in ballistic syllables begins high or slightly above high and glides to an indefinite point between the mid and the low range. The endpoint of the glide is higher when the syllable is checked, unstressed, or utterance-final; the glide falls lower when the following syllable contains a low tone: [n^{tyh}ó$^{ʔ13+}$] *n^{ty}hóʔ*^{13} 'slingshot'; [síəm^{13}] *sío*^{n13} 'hummingbird'.

The mid-high sequence in ballistic syllables begins mid, rises rapidly toward high during the latter half of the syllable nucleus, and then falls toward mid. Often the aspiration, postvelar friction, and fading of voicing which are characteristic of this syllable type obliterate the falling part of the pitch contour. [síəm^{21-2+}] *sío*^{n21} 'señor'; [ntsə́i^{21-2+}] *ncí*^{21} 'cane juice'; [Nn^{t}ú$^{ʔ21-}$] *hn^{t}úʔ*^{21} 'your bed'.

2.5. Voiced segments such as nonsyllabic nasals, laterals, and occluded nasals, when initial in the utterance, assume a neutral pitch fluctuating about mid tone.[7] If such voiced segments are syllable-initial but not initial in the utterance, they assume the final tone of the preceding syllable. This effect is most easily observed when the syllable onset is complex and the initial nasal or lateral is separated from the nucleus of the syllable by one or two intervening consonants. But the assimilation is not operative when the voiced nasal or lateral is noninitial in the syllable and is therefore part of the expanded nucleus (§1.3). Syllabic nasal, on the other hand, occurs with phonemic tone, and is not thus conditioned by the preceding tone. Note the following contrasts in which approximate phonetic tones are marked on the nasals. The word for 'water' (example 1) has a nonphonemic neutral tone on the occluded nasal, but assumes the tone of the preceding syllable in examples 2–4. The occluded nasal in the word for 'river' forms

[7] Tone sandhi occurs between affixes and stems; there is no sandhi between words. In the most common type of sandhi the tone of each suffix remains stable while the stem tone and syllable dynamics vary in rather complex patterns. The details of tone morphology are not treated in this paper.

part of an expanded nucleus, since it is preceded in the syllable onset by another consonant phoneme, *h*. The tone on the nasal is therefore the tone of the nucleus in examples 5–8. The words for 'candles' and 'his face' contain initial syllabic consonants which form a syllable nucleus and therefore bear phonemic tone in their own right, as in examples 9–16. The single nasal onset in the word for 'papers' in examples 17–20 is not as noticeably affected by the preceding tone as is the occluded nasal in the first set of examples. The words for 'his face' and 'papers' demonstrate contrasts of length, phonemic tone, and syllabicity in the initial nasal.

1. [n^{2t}a^{11-}] *n*^{t}*a*^{1} 'water'; 2. [ʔa^{1} n^{1t}a^{11-}] *ʔa*^{1} *n*^{t}*a*^{1} 'is it water? '; 3. [ʔa^{11-} we^{2} n^{2t}a^{11-}] *ʔa*^{1} *we*^{2} *n*^{t}*a*^{1} 'is the water red? '; 4. [t'ʔmá$^{3+3}$ n^{3t}a^{11-}] *tʔmá*^{3} *n*^{t}*a*^{1} 'the (body of) water is large'.

5. [ɴn^{1t}a^{1-}] *hn*^{t}*a*^{1} 'river'; 6. [ʔa^{1} ɴn^{1t}a^{1-}] *ʔa*^{1} *hn*^{t}*a*^{1} 'is it a river? '; 7. [ʔa^{11-} we^{2} ɴn^{1t}a^{1-}] *ʔa*^{1} *we*^{2} *hn*^{t}*a*^{1} 'is the river red?'; 8. [t'ʔmá$^{3+3}$ ɴn^{1t}a^{1-}] *tʔmá*^{3} *hn*^{t}*a*^{1} 'the river is big'.

9. [ḷʟ^{n1}ká$^{2+2-}$] *ṇ*^{1}*lká*^{2} 'candles'; 10. [ʔa^{1} ḷʟ^{n1}ká$^{2+2-}$] *ʔa*^{1} *ṇ*^{1}*lká*^{2} 'are they candles?'; 11. [ʔa^{11-} we^{2} ḷʟ^{n1}ká$^{2+2-}$] *ʔa*^{1} *we*^{2} *ṇ*^{1}*lká*^{2} 'are the candles red?'; 12. [t'ʔmá$^{3+3}$ ḷʟ^{n1}ká$^{2+2-}$] *tʔmá*^{3} *ṇ*^{1}*lká*^{2} 'the candles are large'.

13. [ṇ^{1}nə́m^{2+2-}] *ṇ*^{1}*nó*^{n2} 'his face'; 14. [ʔa^{1} ṇ^{1}nə́m^{2+2-}] *ʔa*^{1} *ṇ*^{1}*nó*^{n2} 'is it his face?'; 15. [ʔa^{11-} we^{2} ṇ^{1}nə́m^{2+2-}] *ʔa*^{1} *we*^{2} *ṇ*^{1}*nó*^{n2} 'is his face red?'; 16. [t'ʔmá$^{3+3}$ ṇ^{1}nə́m^{2+2-}] *tʔmá*^{3} *ṇ*^{1}*nó*^{n2} 'his face is large'.

17. [n^{2+}ə́m^{2+2-}] *nó*^{n2} 'papers'; 18. [ʔa^{11-} n^{2+}ə́m^{2+2-}] *ʔa*^{1} *nó*^{n2} 'are they papers?'; 19. [ʔa^{11-} we^{2} n^{2}ə́m^{2+2-}] *ʔa*^{1} *we*^{2} *nó*^{n2} 'are the papers red?'; 20. [t'ʔmá$^{3+3}$ n^{3+}ə́m^{2+2-}] *tʔmá*^{3} *nó*^{n2} 'the papers are large'.

3.0 The segmental phonemes of Amuzgo consist of 27 consonants and 12 vowels. According to their function in the syllable, the consonants are nonsyllabics or syllabics. There are six types of nonsyllabic consonants: (1) stops *p*, *t*, *c*, *t*^{y}, *č*, *k*, *k*^{w}, *k*^{y}, *ʔ*; (2) fricatives *b*, *s*, *š*, *h;* (3) occluded nasals *m*^{p}, *n*^{t}, *n*^{ty}, *ŋ*^{k}; (4) nasals *m*, *n*, *n*^{y}; (5) lateral and semivowels *l*, *y*, *w*; (6) vibrants *r*, *r̃*. The syllabic consonants are *ṇ*, *ṃb*. The vowels are *i*, *e*, *æ*, *a*, *ɔ*, *o*, *u*, *e*^{n}, *æ*^{n}, *a*^{n}, *ɔ*^{n}, *o*^{n}.

3.1. The twenty-five nonsyllabic consonants are formed at five points of articulation: labial, alveolar, alveolopalatal, velar, and glottal. The four phonemes *p*, *m*^{p}, *b*, and *r̃* are extremely rare.

Labial consonants have a simultaneous velarized tongue position, i.e. during the labial articulation the forward part of the tongue is relatively low and concave while the back is high and quite tense. This results in a variety of unrounded vocoid transitions between labials and following vowels. Since these transitions originate in central or back position, they are more prominent before front and central vowels.

Alveolar consonants are made with the tongue tip. The simple stop, nasal, and occluded nasal vary in point of articulation from alveolar to interdental. This set of sounds is also velarized and causes the same transitional phenomena as the labials when preceding front and central vowels. When *s*, *c*, and *l* precede a cluster of *i* plus vowel they do not show this velarization.

Alveolopalatal consonants are made with both the tongue tip and the tongue blade in contact at the alveolar arch. They are virtually one-segment sounds, with very little offglide.

Velar consonants are made with the tongue back at the velum. In k^w and k^y the labial and palatal offglides are rapid. In semivowel *w* the back tongue position is more prominent than the lip rounding. This, and other features of phonemic pattern, place *w* with the velars rather than with the labials.

Both glottal phonemes pattern as full consonants. The glottal stop varies freely from complete closure to slight glottal trill. The *h* is completely open at the glottis.

3.2. In the nonsyllabic class of consonants the stop series consists of simple nonvelar stops *p*, *t*, t^y, *ʔ*; affricated stops *c*, *č*; velar stops *k*, k^w, k^y. Each of the affricates has a lenis and slightly voiced allophone which occurs after a nasal and before a vowel cluster. [$t^ə$ǽšap^{h}óʔ] *tǽ*^{3}*ša*^{1}*phó*^{ʔ2} 'a pod of a certain tree'; [toʔ] *to*^{ʔ1} 'full'; [t^yoʔ] t^y*o*^{ʔ1} 'bread'; [k^wiku] k^w*i*^{2}*ku*^{1} 'it leaks (roof)'; [k^wá] k^w*á*^{2} 'so, why (exclamation)'; [k^yá] k^y*á*^{2} 'then, when'; [ʔo-nə] *ʔo*^{1}*-na*^{1} 'they go'; [k'ʔo-nə] *kʔo*^{1}*-na*^{1} 'they should go'; [tsʊe] *cue*^{1} 'petate'; [tšʊe] *čue*^{2} 'huipil'; [ndzʊe] *ncue*^{2} 'sap'; [n^ydžʊe] n^y*čue*^{2} 'huipiles'; [tsiəm] *cio*^{n1} 'thorn'; [síəm] *sío*^{n13} 'hummingbird'; [tšó] *čó*^{3} 'a small edible seed'; [t^yó] t^y*ó*^{3} 'a man, male'; [šotšíʔ] *šo*^{2}*čí*^{ʔ2} 'comal'.

The four fricatives are *b*, *s*, *š*, and *h*. The glottal fricative *h* has six allophones: [M, N, N^y, L, w, h]. The first five allophones occur as initial members of two-consonant clusters. each preceding its voiced counterpart. The allophone [h] occurs elsewhere. [ƀʔío] *bʔío*^{3} 'place where the dead go'; [su] *su*^{1} 'resin'; [šu] *šu*^{1} 'a load'; [ha] *ha*^{1} 'we (inclusive)'; [Mməi] *hmí*^{ʔ3} 'hot'; [Nn^tá] *hn'á*^{3} 'expensive'; [$N^y$$n^{ty}$é] *hn'*^{y}*é*^{2} 'many'; [Llui] *hlui*^{21} 'long, tangled (hair)'; [kawwí] *ka*^{2}*hwí*^{21} 'swishing noise'.

The occluded nasals are m^p, n^t, n^{ty}, $ŋ^k$; each consists of nasal followed by homorganic stop. The stop is always lenis and varies from voiceless to voiced. [m^pio-tšé^n] m^p*io*^{2}*-čé*^{n2} 'meanwhile'; [n^ta] n^t*a*^{1} 'water'; [n^{ty}a] n^{ty}*a*^{1} 'soft'; [$ŋ^k$aʔ] $ŋ^k$*a*^{ʔ3} 'cry of parrot'.

The simple nasals are *m*, *n*, and n^y. The alveolar nasal has a velar allophone [ŋ] before velar stops. [mama] *ma*^{2}*ma*^{3} 'she washes'; [ná] *ná*^{13} 'mother'; [n^yəmn^{t}a] n^y*o*^{n3}*n'a*^{1} 'Amuzgo language'; [ŋk^yi] *nk*^{y}*i*^{1} 'himself'.

The lateral *l* and the semivowels *y* and *w* are formed at the alveolar, alveolopalatal, and velar points of articulation. The lateral has an allophone [lL] which begins with voicing and fades to voicelessness before velar stops.[8] Both allophones are optionally nasalized. [lio] *lio*^{2} 'glass'; [lLkaʔ] ~ [lL^{n}kaʔ] *lka*^{ʔ2} 'boards'; [ləistó] ~ [l^{n}əistó] *li*^{2}*stó*^{13} 'ribbon'; [wé] *wé*^{3} 'two'; [yá] *yá*^{3} 'good'. Both *y* and *w* are often nasalized before nasalized vowels in a syllable. The allophone [y^n] presented difficulty until adequate contrast with nasal phonemes was found: [y^na^{n}ʔ-ə́^{n}] *ya*^{nʔ3}*-á*^{n2} 'he is well'; [y^nə́m] *yó*^{n3} 'six'; [n^yə́m] n^y*ó*^{n3} 'fire, embers'; [n^yíəm] n^y*ío*^{n2} 'there are, to exist (pl.)'.

The vibrants are a tongue tip flap *r* and a tongue tip trill *r̃*. The flap shows the

[8] Although the allophone [L] of the phoneme *h* and the allophone [lL] of the phoneme *l* appear to be phonetically similar, the fact that these phones occur in different positions and with distinct conditioning factors makes it plausible to assign them to different phonemes.

conditioning features of both the alveolars and the alveolopalatals in that it is followed by vowel allophones which occur with these two sets: *r* precedes [e], the allophone of *e* which follows alveolopalatals, but it also precedes [^{ə}æ], the allophone of *æ* which follows bilabial and alveolar phonemes. When *r* precedes *i*, there is free variation between the two allophones of *i*. The flap has a voiceless allophone when it precedes velar stops. [t^{ə}æron^{ty}o^{ʔ}] $tæ^{3}ro^{1}n^{ty}o^{ʔ1}$ 'wild grape'; [ká^{ʔ}r̃u] $ká^{ʔ1}r̃u^{2}$ 'whirring sound'; [ré] $ré^{13}$ 'sir'; [tsomar^{ə}ǽ] $co^{1}ma^{2}rǽ^{3}$ 'comadre'; [tšikar^{ʔ}i^{ʔ}] ~ [tšikar^{ʔ}əi^{ʔ}] $či^{1}ka^{1}r^{ʔ}i^{ʔ1}$ 'cicada'; [kaʀk^{y}e] $ka^{1}rk^{y}e^{1}$ 'goosepimply'.

3.3. The syllabic consonants *ṇ* and *ṃb* constitute complete syllable nuclei. The *ṃb* is a prenasalized, voiced bilabial trill with simultaneous velarized tongue position. It occurs only in the example given below. The *ṇ* has five allophones [ṃ], [ṇ], [ṇ^{y}], [ḷ], and syllabic [ŋ]. Each occurs at the point of articulation of the consonant in the following syllable. In the first example below it is the labial and not the glottal stop which determines the point of articulation of the syllabic. When *ṇ* precedes *l* it fuses with the lateral and nasalizes it. [ṃ^{ʔ}mɔ] $ṃ^{1ʔ}mɔ^{21}$ 'I'll teach'; [ṇnə́m] $ṇ^{1}nó^{n2}$ 'his face'; [ṇ^{y}n^{y}e] $ṇ^{1}n^{y}e^{21}$ 'he'll hear'; [ḷʟ^{n}ká] $ṇ^{1}lká^{2}$ 'candles'; [šaṃb̃] $ša^{1}ṃb^{1}$ 'antlion'.

3.4. The twelve vowel phonemes contrast in tongue position as front, central, and back; in tongue height as high, mid, and low; and in timbre as oral and nasal. The back vowels are rounded. There are seven oral vowels: *i*, *e*, *æ*, *a*, *ɔ*, *o*, and *u*. For the mid and low tongue positions there are corresponding nasalized vowels: e^{n}, $æ^{n}$, a^{n}, $ɔ^{n}$, and o^{n}. The oral-nasal contrast is neutralized after a nasal; such vowels are written in this paper as oral.

The vowel *i* is high front. It has an allophone [əi] after velarized consonants; an allophone [i] occurs elsewhere (including after velars). The two allophones vary freely after the clusters $k^{w}h$ and $r^{ʔ}$. [k^{w}it^{y}i] $k^{w}i^{2}t^{y}i^{2}$ 'to be sewed'; [k^{w}itəi] $k^{w}i^{2}ti^{2}$ 'to tremble'; [tší^{ʔ}] $čí^{ʔ2}$ 'moon, month'; [tsə́i^{ʔ}] $cí^{ʔ3}$ 'bone'; [n^{ty}í^{ʔ}] $n^{ty}í^{ʔ2}$ 'pressed cane stalk'; [n^{t}ə́i^{ʔ}] $n^{t}í^{ʔ3}$ 'buds'; [šilu] $ši^{1}lu^{1}$ 'a small variety of fish'; [səi] si^{1} 'fresh corn'; [mak^{wh}i^{ʔ}-ə́] ~ [mak^{wh}əi^{ʔ}-ə́] $ma^{2}k^{w}hi^{ʔ21}$-$á^{2}$ 'I take out, extract'; [tšikar^{ʔ}i^{ʔ}] ~ [tšikar^{ʔ}əi^{ʔ}] $či^{1}ka^{1}r^{ʔ}i^{ʔ1}$ 'cicada'.

The vowel *e* is mid front. It sometimes ends with a glide toward *i* position. It has a higher tongue position after palatalized velar stop and in ballistic syllables. The nasalized phoneme e^{n} has an allophone [əi^{n}] after velarized (but not after velar) stops. In utterance-final position all allophones of e^{n} fluctuate freely as nasalized vowels with and without following [ŋ]. [t^{y}e] $t^{y}e^{2}$ 'priest'; [mak^{y}éŋ] ~ [mak^{y}é^{n}] $ma^{2}k^{y}é^{n1}$ 'he eats'; [t^{y}éŋ] ~ [t^{y}é^{n}] $t^{y}é^{n3}$ 'tight'; [tə́iŋ] ~ [tə́i^{n}] $té^{n3}$ 'cold'. Like the oral vowel, the e^{n} is higher after the palatalized velar stop.

The vowel *æ* is low front. Three allophones have the following distributions: a considerably fronted and raised allophone occurs after alveolopalatal and palatalized consonants and after *i*; a lower and more central allophone occurs after velarized consonants; an allophone about midway between the other two occurs after k^{w}, *w*, and *u*. The first allophone has a rapid palatal onglide, the second has a rapid onglide of central-vowel quality; both onglides are conditioned by the preceding consonants. The corresponding nasalized $æ^{n}$ has similar allophones in the same environments. [mak^{y}É] $ma^{2}k^{y}ǽ^{1}$ 'I eat'; [tašÉ^{ʔ}-ə́] $ta^{2}šǽ^{ʔ1}$-$á^{2}$

'I asked'; [sᵊæ] *sæ*^{2} 'but'; [tᵊǽ] *tǽ*^{3} 'sour'; [mawæˀ-ə́] *ma*^{2}*wæ*ˀ^{21}-*á*^{2} 'I wipe'; [tˀʊ́æ] *t*ˀ*úæ*^{3} 'I was frightened'; [škʸᴇ^{n}] *šk*ʸ*æ*^{n21} 'my head'; [tᵊæ^{n}ˀ-ǽ^{n}] *tæ*^{n}ˀ^{13}-*ǽ*^{n2} 'her beads'.

The vowel *a* is low central. It varies freely to [ə] in nonstressed syllables, as does the corresponding nasalized phoneme. [s'ˀá-yə́] *s*ˀ*á*^{3}-*yá*^{2} 'my husband'; [tʰa^{n}ˀ-ə́^{n}] *tha*^{n}ˀ^{2}-*á*^{n2} 'his skin'.

The three back vowels *ɔ*, *o*, and *u* often have a nonphonemic onglide from lesser to greater lip rounding, particularly noticeable in stressed controlled syllables. The glide is not contrastive, nor is it consistent enough to be part of a phonemic diphthong. The vowel *ɔ* is low and quite far back, and has considerable variation in rounding. The corresponding nasalized vowel *ɔ*^{n} has similar articulation. [tɔ́ˀ-ə́] *tɔ́*ˀ^{1}-*á*^{2} 'I began'; [tɔ^{n}ˀ-ɔ́^{n}] *tɔ*^{n}ˀ^{2}-*ɔ́*^{n2} 'he began'.

The vowel *o* is mid back, without significant variants. The nasalized phoneme *o*^{n} is a phonetic sequence [əm], with a further allophone [m̥] at the end of a phonological foot: [tsʰə́mˀ-ḿ̥] *chó*^{n}ˀ^{1}-*ó*^{n2} 'his village'. The reasons for this analysis are discussed in §4.4. [tóˀ] *tó*ˀ^{2} 'trash'; [ntə́mˀ] *ntó*^{n}ˀ^{13} 'oven'.

The vowel *u* is high back, with some fluctuation in lip rounding. After grooved obstruents (*c*, *č*, *s*, *š*) *u* often has an unrounded front onglide [ⁱu]. There are two other allophones; [ʊ], with lower tongue position and less lip rounding, occurs in vowel clusters preceding mid and low vowels, and [u] occurs elsewhere. [túˀ] *tú*ˀ^{2} 'corncob'; [tsⁱu] *cu*^{1} 'became lost'; [tʊ́aˀ] *túa*ˀ^{3} 'rained'.

4.0. The analysis of certain segments and sequences presents difficulties which are discussed here in detail.

4.1. With a few exceptions, the stops, fricatives, and liquids (nasals and *l*), the semivowel *w*, and the flap occur before ˀ or *h*. These sequences are interpreted as clusters rather than complex units, for six reasons. (1) The similar distribution of both ˀ and *h* with such a wide variety of preceding segments suggests analysis into clusters of parallel but contrasting constituency. (2) An aspirated and a glottalized series of stops would add considerably to the already extensive phoneme inventory. (3) Both ˀ and *h* occur as simple onsets in syllable margins apart from participation in consonant clusters. (4) When ˀ follows stops there is considerable phonetic variation from glottalized consonant C'V to a sequence of glottalized consonant plus glottal stop C'ˀV to a sequence of glottalized consonant plus transition vocoid plus glottal stop C'ᵊˀV. This variation perhaps implies a phoneme boundary rather than a close-knit, complex phonemic unit. (5) Similarly, most of the liquids and fricatives before ˀ often have an intervening transition vocoid of the type just mentioned. The sequences with fricatives typically vary in articulation between C'ˀV and C'ᵊˀV, while the sequences with liquids typically vary between CˀV and CᵊˀV, with the glottal stop as a sequential and not simultaneous articulatory component. (6) For sequences of liquids followed by ˀ or *h*, contrastive reverse sequences are also possible, as *nh*, *hn*, *l*ˀ, ˀ*l*, *n*ʸˀ, ˀ*n*ʸ.

In accordance with similar considerations of distribution and economy, combinations of ˀ and *h* before liquids are likewise phonemicized as separate consonants. [ɴʸnᵗʸi] *hn*ᵗʸ*i*^{2} 'evil spirit'; [ˀnᵗa] ˀ*n*ᵗ*a*^{1} 'baby'; [ɴnəm] *hno*^{n1} 'a dance'; [ˀná] ˀ*ná*^{2} 'thing'; [ʟlúiˀ] *hlúi*ˀ^{2} 'came out'; [kaˀliˀ] *ka*^{1}ˀ*li*ˀ^{1} 'short'.

4.2. The affricates [ts] and [tš], the velar stops [kʸ] and [kʷ], and the four occluded nasals are considered to constitute single complex phonemes. Setting up these eight phonetic sequences as unit phonemes helps to clarify and systematize the clustering patterns of consonants.

The affricates and the palatalized and labialized velar stops occur in clusters in a distribution similar to simple stops. Furthermore, the velar stops are found in the following contrasts: [kʷá] *kʷá*^{2} 'why, so!'; [makʷaˀ-nʸe] *ma*^{2}*kʷaˀ*^{2}*-nʸe*^{1} 'he chokes'; [kúa] *kúa*^{2} 'she should weave'; [kua] *kua*^{2} 'he should lie down'; [kʸóˀ-yóˀ] *kʸóˀ*^{2}*-yóˀ*^{2} 'come! (pl.)'; [tʸeŋkʸuˀ] *tʸe*^{2}*nkʸuˀ*^{2} 'he touched'; [kʸíoˀ] *kʸįoˀ*^{2} 'swallow! (sg.)'; [kʸioˀ] *kʸioˀ*^{1} 'animal'; [təikʸiuˀ] *ti*^{1}*kʸiuˀ*^{32} 'a while ago'.

The occluded nasals are distributed like the nasals. There are consonant clusters consisting of nasal plus homorganic stop which contrast with the occluded nasal phonemes. In illustrating and discussing this contrast, *nt* will represent the six possible sequences of stops after homorganic nasals: *mp*, *nt*, *nʸtʸ*, *nk*, *nkʸ*, *nkʷ*. The symbol *nᵗ* will represent the four occluded nasal phonemes *mᵖ*, *nᵗ*, *nᵗʸ*, *ŋᵏ*.

In the *nt* cluster, as contrasted with the *nᵗ* unit phoneme, the nasal is short, the stop is of greater duration and fortis articulation.[9] There is no carry-over of voicing from the first to the second segment; in fact, a sharp break in the voicing component is noticeable between the two segments. This is attributable to the transition between the two segments; it may be compared to the fade of voicing in the cluster *lk*, in which *l* becomes voiceless [lʟ] just before the velar stop. On the other hand, in the *nᵗ* phoneme, the nasal is longer, the stop shorter and lenis. There is often but not always a carry-over of the voicing from the nasal to the stop.

At the alveolar and alveolopalatal points of articulation, contrasts between cluster and unit phoneme are frequent, and several minimal pairs can be found. [kanʸtʸáˀ] *ka*^{2}*nʸtʸáˀ*^{2} 'nape of your neck'; [kanᵗʸáˀ] *ka*^{2}*nᵗʸáˀ*^{2} 'spicy'; [nʸtʸoˀ] *nʸtʸoˀ*^{1} 'bread (pl.)'; [nᵗʸoˀ] *nᵗʸoˀ*^{1} 'itchy'; [ntá] *ntá*^{2} 'liquor'; [nᵗá] *nᵗá*^{2} 'children (plurally possessed)'; [n̥tᵊæˀ] *n̥*^{1}*tæˀ*^{3} 'it will be closed'; [n̥nᵗᵊæˀ] *n̥*^{1}*nᵗæˀ*^{3} 'it will be finished'; [nʸtʸe] *nʸtʸe*^{2} 'priests'; [nᵗʸé] *nᵗʸé*^{3} 'high'; [ntə́iˀ] *ntį́ˀ*^{3} 'buds'; [nᵗə́iˀ] *nᵗį́ˀ*^{3} 'bones'.

Examples of contrasting cluster and unit phoneme are somewhat rare at the labial and velar points of articulation. Labial consonants are uncommon in the language as a whole, while contrast in the velar position is found only with the simple velar stop and not with the labialized or palatalized velar stops. In some words there is free variation between cluster and unit phoneme. [mpə́i^{n}] *mpé*^{n13} 'taut'; [mᵖío] ~ [ɓío] *mᵖįo*^{2} ~ *bįo*^{2} 'meanwhile'; [səiˀmpáˀ] *síˀ*^{3}*mpáˀ*^{3} 'lungs'; [tᵊǽrampó] *tǽ*^{3}*ra*^{1}*mpó*^{2} 'a top'; [mᵖóˀmᵖóˀ] *mᵖóˀ*^{3}*mᵖóˀ*^{3} 'a bubbling noise'; [ŋkótší ˀ] ~ [ŋᵏótšíˀ] *nkó*^{2}*čį́ˀ*^{2} ~ *ŋᵏó*^{2}*čį́ˀ*^{2} 'comal'; [təiŋkaˀ] *ti*^{1}*nkaˀ*^{1} 'a flick of the finger'; [ŋᵏaˀ] *ŋᵏaˀ*^{3} 'cry of a parrot'.

There are at least four other possible analyses of the data given above. (1) It would seem plausible to phonemicize [nt·] as a cluster **nht* and [nᵗ] as a

[9] While at the University of Michigan in 1961, I undertook a brief study of these clusters and unit phonemes with the use of a spectrograph. The resulting data, though limited, confirm the duration and voicing contrasts here described.

cluster *nt*. The *h* would account for the shortness of the nasal and for the voiceless transition between the two phonemes. This solution is rejected because it creates a three-consonant cluster **nht* of unique composition. In no other case does the focal consonant,[10] in this case the stop, occur next to the syllable nucleus with two peripheral consonants preceding. To be sure, two clusters do occur which consist of initial nasal, *h*, and final nasal, and of initial lateral, *h*, and final lateral, i.e. *nhm* and *lhl*. But these two clusters, in contrast to **nht*, contain a liquid as the final constituent, and the initial consonant is focal; the final consonant patterns as a part of the expanded nucleus of the syllable. This could not be so in the posited **nht* cluster. While clusters of up to four consonants are found in Amuzgo, the rejected **nht* would entail acceptance of a five-consonant cluster **nhtʔm*.

(2) Another solution would be to posit a long and a short *t*, or a fortis and a lenis *t*, each with inverse effect on the duration of the preceding nasal. The lenis *t* would have a highly restricted distribution, however, in that it would contrast with fortis *t* only after nasals. In all other environments the contrast would be neutralized. Observable difference in consonant length in other environments is slight and clearly conditioned: a consonant that occurs as a single onset in a stressed syllable is sometimes slightly lengthened. Because of the highly restricted environment for contrast between the proposed fortis and lenis phonemes, this solution is rejected.

(3) With similar reasoning, one might posit a long and a short *n*, or a fortis and a lenis *n*. In this solution, the nasals would be considered to affect inversely the duration and voicing of the following stop phonemes. The same situation of restricted contrast which precludes the previous solution rules out this one also.

(4) A fourth solution would be to posit an *nt* cluster contrasting with an **nd* cluster. Inasmuch as **d* does not occur elsewhere as a phoneme, this solution also would yield a phonemic contrast of highly restricted distribution. For this reason this solution also is rejected, and we revert to the analysls *nt* (cluster) and *n*ʻ (unit phoneme).

4.3. The vowel phonemes present two problems. First, the two vowel glides [əi] and [əi^{n}] could be considered sequences of two vowels or single-vowel units. Both [əi] and [əi^{n}] consist of a glide which begins in the area of mid central tongue position and moves forward and up toward high front tongue position. A possible solution would be to analyze them as the phonemes *a* and a^{n} followed respectively by *i* and i^{n}. The advantages of this solution are two. (a) It does, in a sense, meet the test of phonetic realism in that the glide begins in the vicinity of [ə], which is one variant of *a* in certain environments, and glides toward *i*, at times actually reaching this position. (b) The solution encounters no contradictory evidence of phones in contrast, like the third solution below.

[10] 'Focal consonant' as used here refers to that consonant which appears to be more prominent and more basic in relation to the other consonants which occur in the cluster with it. It usually occurs in a position which allows for greater diversity of membership. It has a higher phonetic rank, according to criteria set up by Eunice Pike, 'Phonetic rank and subordination in consonant patterning and historical changes', *Miscellanea phonetica* (*Le maître phonétique*) 2.25–41 (1954).

There are, however, three marked disadvantages of this solution. (a) It adds an extra phoneme $*i^n$ of limited distribution, occurring only after a^n. (b) It yields a vowel cluster of unique composition, with the first member low central and both members nasalized; all other clusters contain only high vowels as first members, and these are only phonetically or not at all nasalized in that position. (c) Evidence from morphology shows that VV sequences do not occur in affixes (except for these two posited sequences). The limitation is not unimportant; several other significant restrictions of phonological distribution correlate with the phonemic composition of stems and affixes. Thus, the more complex consonant clusters, stress, and certain tone sequences are all limited to stems.

A second solution to the vowel glide problem is to consider the sequence [əi] a phonetically complex syllable nucleus, one allophonic variant of the phoneme *i*, and to consider [əi$^{\text{n}}$] an allophone of a phoneme $*i^n$. Again this sets up an extra phoneme $*i^n$, with a single allophone [əi$^{\text{n}}$].

A third solution would be to consider the phonetically complex syllable nuclei [əi] and [əi$^{\text{n}}$] allophones of *e* and e^n. Ignoring crucial data to be presented below, it would be possible to argue as follows: (1) These vowel glides occur after labial and alveolar consonants and are therefore in complementary distribution with *e* and e^n, which follow alveolopalatal consonants. (2) This solution gives a full and consistent range of distribution to the allophones involved. (3) It gives a desirable economy of phonemes, which the vowel-sequence solution does not. (4) It gives a symmetrical patterning of the high vowel *i* with high vowel *u* in that neither is nasalized.

In spite of the attractiveness of that solution, it is not possible. A phonetic contrast between [e] and [əi] has been observed in one pair of words: [k$^{\text{wh}}$í?] ~ [k$^{\text{wh}}$ə́i?] 'to take out'; [k$^{\text{wh}}$e?] 'to arrive'.

The solution here adopted is a variant of the second and third above. I assign [əi] to *i*, but [əi$^{\text{n}}$] to e^n. This has all the advantages of the third solution yet avoids its fatal blemish. In particular, it does not violate the contrast between [e] and [əi] in the words for 'take out' and 'arrive'; and it takes account of the free variation between allophones [i] and [əi] in the same example. As explained in §3.4, allophone [əi] of *i* and allophone [əi$^{\text{n}}$] of e^n have their phonetic rationale in the occurrence of preceding velarized consonants.

4.4. A second problem in vowel analysis concerns the analysis of the phonetic sequence [əm] which occurs in syllable types +O +N ±T and +O +Ń ±T, and the syllabic nasal [m̩] which occurs in syllable type +Ń. Since only the vocoid [ə] precedes [m̩] in the syllable types first mentioned, the [ə] could be considered an allophone of any one of the seven oral vowels; most probably it would be the vowel *a* which has an allophone of a quality similar to that which occurs in unstressed syllables. Because [ə] before [m̩] varies phonetically to position higher and further back than [a], and for other reasons mentioned below, I do not consider it an allophone of *a*. On the other hand, the sequence [əm] can be considered either a phonetically complex syllabic nasal, or a phonetically complex nasalized vowel.[11] Analysis as a nasalized vowel appears preferable,

[11] In the former case the [əm] which occurs in syllable types +O +Ń ±T and +O +N ±T would be in complementary distribution with both [m̩] which occurs in syllable type

for five reasons. (a) Nasalized vowels e^n, $æ^n$, a^n, and $ɔ^n$ occur, but neither [u^n] nor [o^n] occurs as such. Interpretation of [əm] as a phonemic nasalized back vowel fills this hiatus. (b) There is structural parallelism between [əm] as the manifestation of either o^n or u^n and the free variation of [e^n] to nasalized vowel plus postposed velar nasal. (c) The sequence [əm] enters into the cluster [iəm]. Since *i* is followed in other clusters by any of the oral back vowels, and by a^n or $ɔ^n$, phonemic interpretation of this cluster as io^n or iu^n is plausible. (d) The sequence [əm] behaves like a single vowel in the syllable as to timing and occurrence of tone. Whereas the syllabic consonants occur in only one syllable type, +N, and with one tone, high, the sequence [əm] occurs in both of the syllable types +O +N ±T and +O +Ń ±T, and with all tones and tone sequences. (e) Finally, in the verb and noun morphology, the sequence [əm] occurs in the same situation as the nasalized vowels. The occurrence of nasalized vowels in the stem to indicate third person becomes more regular with the assumption that [əm] is phonemically o^n or u^n. Thus, [ts'ʔɔ́] 'arm' becomes [ts'ʔɔ^n] 'his arm'; [t^{h}á] 'went' becomes [t^{h}a^n] 'he went'; [š'ʔe] 'leg' becomes [š'ʔe^n] 'his leg'; [n^{y}t^{yh}i] 'knows' becomes [n^{y}t^{yh}e^n] 'he knows'; [tsó] 'said' becomes [tsəm] 'he said'; [matšu] 'carries' becomes [matšə́m] 'he carries'.

Reasoning similar to that above can be applied to the interpretation of [m̩], which occurs with no preceding vowel in the syllable type +Ń. (a) Nasalized vowels e^n, $æ^n$, a^n, $ɔ^n$ occur in this unstressed ballistic syllable type as reduplication of the final vowel of the stem. When [m̩] is considered to be an allophone of o^n or u^n the result is a symmetrical distribution of all the nasalized vowels in the syllable type +Ń. (b) Since [m̩] occurs in +Ń only when there is a sequence [əm] in the stem, there certainly seems to be a structural parallel between the nasalized vowels and the [əm] which occur in stems, and the reduplicated nasalized vowels and the [m̩] which follow in the syllables of the type +Ń. For example, *wi*^{ʔ2} 'is sick' becomes *we*^{nʔ2}-*é*^{n2} 'he is sick'; *t*^{y}*he*^{ʔ2} 'arrived' becomes *t*^{y}*he*^{nʔ21}-*é*^{n2} 'he arrived'; *tæ*^{ʔ1} 'beads (unspecifically possessed)' becomes *tæ*^{nʔ13}-*ǽ*^{n2} 'her beads'; *wa*^{ʔ1} 'house (unspecifically possessed)' becomes *wá*^{nʔ1}-*á*^{n2} 'his house'; *cɔ*^{ʔ2} 'basket (unspecifically possessed)' becomes *cɔ*^{nʔ2}-*ɔ́*^{n2} 'her basket'; [náto?] 'trail (unspecifically possessed)' becomes [nátəmʔ-ḿ] 'his trail'; [mahúʔ] 'throws' becomes [mahəmʔ-ḿ] 'he throws'.

Granting the general plausibility of these arguments there remains the problem of assigning [əm] and [m̩] to a specific back vowel. The fact that there is no other nasalized high vowel, the structural parallelism with the mid vowel e^n, and the expressed opinions of native speakers of Amuzgo have encouraged me to assign [əm] and [m̩] to the phoneme o^n, rather than to $*u^n$. Thus, [nátəmʔ-ḿ] *ná*^{1}*to*^{nʔ2}-*ó*^{n2} 'his trail'; [mahəmʔ-ḿ] is phonemicized *ma*^{2}*ho*^{nʔ3}-*ó*^{n2} 'he throws'. This analysis yields a gratifying parallelism of vowel distribution as well as an efficient and practical solution to the problem of [m̩] and [əm].

+Ń, and [m̩] which occurs in syllable type +N before labials. The three could be considered allophones of a single phoneme. I have allowed distributional criteria, however, to carry more weight than phonetic similarity in the assignment of these allophones. The [m̩] of syllable type +N has been analyzed as a phonemic syllabic nasal which precedes only syllables of types +O +N ±T and +O +Ń ±T. On the other hand[əm], and the [m̩] of the syllable type +Ń, occur in positions filled by vowels.