(365)	U.F.	/bɬaTɬnɬ/
	/ɬ/ DELETION (352)	baTɬnɬ
	SPIRANTIZATION-STOP (87)	bařɬnɬ
	/ɬ/ DELETION' (363)	baɽnɬ
	DEFLAP	baɾnɬ
	S.F.	[m'baɾnə]
		'he is coming'

Now that we have formulated /ɬ/ DELETION', we can account for another case of alternation in verbals by applying it along with one more as yet unformulated rule. Consider 366-368:

	(a)	(b)	(c)	(d)
(366)	[n'dořə]	['řɔɾnə]	[nə'mořə]	['mɔɾnə]
	'to cut'	'he is cutting'	'to throw'	'he is throwing'
(367)	['ndə]	['naɾnə]	['nəmbəřə]	[m'baɾnə]
	'to eat'	'he is eating'	'to come'	'he is coming'
(368)	[n'da]	['řaɾnə]	[nəmə'řa]	[mə'řaɾnə]
	'speaking'	'he is talking'	'building'	'he is building'

Both 366a and 366c are infinitival forms. They are constructed by the formula /nɬ/ + vb stem + /Tɬ/. In 366c the prefix /nɬ-/ and the suffix /-Tɬ/ surface as [nə] and [řə]. In 366a, however, the prefix surfaces as [n] minus the following vocalic segment. Furthermore, by comparing 366a-d, it is also apparent that the verb stem meaning 'cut' is /To-/. If the underlying form of 366a is /nɬ+To+Tɬ/, then the surface form manifests two changes that interest us here. First, the /ɬ/ between /n/ and /T/ does not surface as [ə]. This is just as we expect because the underlying form meets the structural description of /ɬ/ DELETION' (363). And second, the /T/ of the verb stem does not surface as [ř], but rather as [d]. The two changes together account for the [nd] in [n'dořə].

Next, compare 368a and 368c, which are participial forms. They are constructed by the formula /nɬ/ + vb stem + /a/. In 368c the /nɬ-/ prefix surfaces as [nə], but as [n] in 368a. Furthermore, by

comparing 368a with 368b it is evident that the stem begins with /T/, and that the same two changes we described above, i.e. /ɬ/--->Ø and /ɳř/--->[nd], account for the [nd] in [n'da].

Finally, 367a shows the same two changes involving abutting formatives at the end of the infinitive. The suffix /-Tɬ/ surfaces as [řə] in 367c, but as [də] in 367a. Furthermore, by comparing 367a with 367b we see that the verb stem begins with /n/, and that the same two changes that occurred at the beginning of 366 and 368 account for the [nd] in ['ɳndə]. So when /ɬ/ DELETION' operates and produces the sequence [ɳř], it undergoes one further change and surfaces as [nd]. The rule NASAL-FLAP COALESCENCE summarizes this process and accounts for these occurrences of [nd]:

(369) NASAL-FLAP COALESCENCE

$$\begin{bmatrix} C \\ +\text{coronal} \\ -\text{obstruent} \\ +\text{nasal} \\ +\text{syllabic} \end{bmatrix}_1 + \begin{bmatrix} C \\ +\text{coronal} \\ +\text{obstruent} \\ -\text{nasal} \end{bmatrix}_2 \text{ ----> } \emptyset_1 + \begin{bmatrix} C \\ +\text{coronal} \\ +\text{obstruent} \\ +\text{nasal} \end{bmatrix}_3]_{vb}$$

NASAL-FLAP COALESCENCE states that when [ř] follows a syllabic alveolar nasal [ɳ] across a formative boundary, they are replaced by the complex segment [nd] that preserves [ř]'s value for 'obstruent' and [ɳ]'s value for nasal. It only applies to verbals and then only across a formative boundary.[33] The following derivations illustrate the application of NASAL-FLAP COALESCENCE whose structural description necessarily limits its application to strings produced by /ɬ/ DELETION' (363). Derivations 370a-c illustrate its application:

(370)	(a)	(b)	(c)
U.F.	/nɬToTɬ/	/nɬnɬTɬ/	/nɬTɬa/
/ɬ/ DELETION	-----	-----	nɬta
/ɬ/ DELETION'	ɳToTɬ	ɳɳTɬ	ɳTa

NASAL-FLAP COALESCENCE	ndoT^{l}	n̥nd^{l}	nda
S.F.	[n'doɾə]	['n̥ndə]	[n'da]
	'to cut'	'to eat'	'speaking'

5 GLOTTAL STOP AND SYLLABLE STRUCTURE

We have described Angave's underlying vowels and consonants focusing on the processes that produce their surface representations. There is, however, one frequently occurring surface segment that has not been included in the inventory of underlying consonantals. This is glottal stop, which has been analyzed as a suprasegmental and assigned to the syllable level of the phonological hierarchy. Because it surfaces as a consonant-like segment in Angave, and because it has been analyzed as an underlying consonant in several other Angan languages,[34] we will discuss it's analysis here. And this discussion of glottal stop will complete our look at processes that affect underlying segments in Angave.

Before exploring the possible ways glottal stop can be accounted for within the Angave sound system, we must first note its distribution and other factors in the light of which each analysis will have to be evaluated. The distribution of glottal stop is quite limited. In relation to segments, it must be preceded by a vowel, and may be followed by a vowel or consonant. In relation to syllables, it may only terminate them. In relation to words, it may occur medial, or final if followed by an external word boundary:

(371)	medial	/...V?V.../
		/...V?CV.../
	final	/...V?##/.

Though glottal stop has a limited distribution, it is contrastive, for the only difference between some words is the

presence or absence of a glottal stop. Consider the following pairs:

(372)	/'lwɬ/	['lwu?]	'a lizard'
(373)	/'ɬwɬ/	['l?wu?]	'child'
(374)	/'alwɬ/	['alwu?]	'stinging nettle'
(375)	/'aɬwɬ/	['al?wu?]	'a tree'
(376)	/wa'Tá/	[wa'ɾa?]	'body'
(377)	/wá'Tá/	[wa'ta?]	'board'
(378)	/'emɬ/	['emə]	'away'
(379)	/'émɬ/	['e?mə]	'above'
(380)	/'amɬ/	['amə]	'wherever'
(381)	/'ámɬ/	['a?mə]	'again'
(382)	/'aTɬo/	['aɾo?o]	'grandfather'
(383)	/'aTɬó/	['aɾo?o?]	'cockatoo'
(384)	/'Ḳɬo/	['ḳʰo?o]	'he'
(385)	/'Ḳɬó/	['ḳʰo?o?]	'pitpit'
(386)	/'Pɬnɬ/	['pə?nə?]	'hidden'
(387)	/'Pɬnɬ/	['pənə?]	'a tree'

A third consideration is the frequency with which glottal stop occurs. In underlying forms it averages occurrences on every third syllable in nominals and every seventh syllable in verbals.

Fourth, speaker perception of glottal stop appears to be less well defined than it is for segments. When asked to say a word slowly, speakers may drop out some or all of the glottal stops except the last one. When taking dictation tests new literates frequently leave out most glottal stops and then a short time later are unable to read what they have written.

Fifth, the occurrence of final glottal stop can usually be predicted by grammatical class. For example, nominals, except for the masculine gender, nearly always end in glottal stop. Final verb forms never end in glottal stop. Adverbs and locationals also typically end without a final glottal stop.

Sixth, the glottal stop that occurs preceding an external word boundary is regularly deleted in continuous speech. Consider 388 vs. 389, 389 vs. 390 and 390 vs. 391:

(388)	[ondə'bɪʔ]	'pig'
(389)	[ondə'bɪ 'mya?]	'piglet'
(390)	[ondə'bɪ 'mya 'waʊʔ]	'two piglets'
(391)	[ondə'bɪ 'mya 'waʊ 'šuŋwʊ wʊ'naʔanə]	'I saw two piglets.'

In view of these considerations, how should glottal stop be analyzed? It could be analyzed as: (1) a contrastive underlying segment like other consonantals, (2) a redundant and predictable element, (3) a suprasegmental relating to a level higher than the segmental, (4) a feature on a set of complex vowels (similar to nasalized vowels in other languages), and (5) some combination of two or more of the above. Let's consider the possibilities in the order suggested. Glottal stop could be analyzed as a segment since it was shown to be contrastive. Also, it is consonantal in nature for it is perceived absolutely as consonantals are and not relatively as suprasegmentals are. For example, English stress, a suprasegmental, is perceived as a degree of intensity associated with a syllable in relation to the intensity of the other syllables which precede and follow it. Therefore we can say that supra-segmentals are perceived relatively. Segmentals (including glottal stop), on the other hand, do not depend upon surrounding syllables to be perceived, and therefore we can say that they are perceived absolutely. These two reasons, however, are hardly sufficient to include glottal stop in the inventory of underlying consonantals. First, it is contrastive with its absence in 372-387, but not with other consonantals. It cannot contrast with other consonantals for they occur at opposite ends of the syllable. Second, glottal stop's distribution shows that it cannot be a consonantal for it never occurs syllable initial, and consonantals never occur syllable final. Moreover, consonantals are conserved much better in

speech and students don't leave them out in dictation drills, so they are perceptually better defined than glottal stop. And finally, glottal stop occurs much more frequently than any other single consonantal. In the light of these counter arguments I conclude that glottal stop is too different from consonantals to be included in their inventory.

A second possible analysis is to predict the occurrences of glottal stop as redundant and consequently introduced by rule. Medial occurrences of glottal stop cannot be predicted because of contrasting pairs like 374-375, but what about those that occur in final position? Couldn't they be predicted by rule and then the medial occurrences accounted for another way? This is a distinct possibility, and we shall explore its potential as a solution. We noted earlier that final glottal stop is usually predictable on the basis of grammatical categories. Masculine nominals and pronominals typically end without a glottal stop. Nevertheless, there are several exceptions to be accounted for. For example, /waú/ 'two (masc)' is terminated by a glottal stop even though it is masculine. This exception is easily accounted for by the principle of minimization of allomorphy (one form, one function), for the other nine genders for 'two' also end in glottal stop (i.e. /bɬaú/, /bɬĶaú/, /wɬnɬĶaú/, /wlPaú/, etc.). If historically /waú/ did end without a final glottal stop, then its irregularity from the other forms has been leveled by acquiring a non-historical final glottal stop. We could no doubt come up with ways to account for many of the exceptions, but such ad hoc rules would be required that it hardly appears to be the best way to handle final glottal stop. It is quite certain, however, that in Proto-Angave final glottal stop was predicted by some very general rules.

A third possible analysis is to assign glottal stop to a level higher in the phonological hierarchy than the segmental, so that it is a suprasegmental like stress or tone. This possibility is particularly attractive in view of glottal stop's distribution in

syllables. Glottal stop only terminates syllables; so as a syllable level feature it would differentiate two sets of syllables, terminated and unterminated (doubling the inventory of syllables). This analysis is also attractive because it does not treat glottal stop as another consonantal, but rather as a suprasegmental. Also, /ɬV/ frequently surfaces as a single laryngealized vowel in the most casual speech. Other consonantals that interrupt vowel sequences are not subject to such change, indicating that glottal stop is not segmental in nature. Furthermore, we have seen that glottal stop is closely associated with the boundaries it precedes in the process described by MONOPHTHONGIZATION' (306). This close association with boundaries sets it off from consonantals, for they have no such close association with boundaries. It may also be that glottal stop is perceived less well (by new literates) than other segments precisely because it is a suprasegmental. This is the same analysis that has been proposed for Ampeeli-Wojokeso,[35] another Angan language.

A fourth possible solution is to posit a set of vowels with internal sequential structure, that is, complex vowels which are terminated by glottal closure. One advantage of this proposal is that it avoids the claim that glottal stop is a prosodic feature at bottom. For prosodic features (stress, tone, etc.) are perceived relatively in contrast to neighboring structures. Glottal stop, on the other hand, is perceived absolutely, as segments are. Thus, it could be said for Angave that glottal stop is less well defined perceptually because it is part of a complex vocalic segment, a vowel terminated by glottal closure.

To sum up our discussion of glottal stop, it is contrastive in medial position, and therefore, must be maintained in underlying representations. Because it is so different from consonantals, I reject including it in their inventory. Furthermore, many final glottal stops can be predicted by rule, but the exceptions would

require that the rules be quite ad hoc, a fact which suggests that speakers handle these occurrences in another way. Also, the way final glottal stop is regularly deleted suggests that it is part of underlying forms. Otherwise, they would be inserted by rule and then immediately deleted again unless they occurred before an external word boundary. I also reject treating glottal stop as a feature belonging to complex vowels because it would double the inventory of underlying vowels. If we analyze glottal stop as a suprasegmental, we do not need to increase the inventory of vowels, and at the same time we recognize its special relationship to them. Furthermore, since syllables chunk up speech in between segments and words, it does not seem unreasonable that there should be some overlap between relative (i.e. suprasegmental) and absolute (i.e. segmental) features at the syllable level.

This problem of how to analyze glottal stop is not unique to Angave or Angan languages. Anne Cochran (1977:45f) has studied the problem glottal stop has posed to alphabet designers throughout Papua New Guinea. In addition to surveying the orthographic representation several languages use for glottal stop, she also discusses the status of glottal stop in sound systems. She concludes that "glottal stop is not necessarily a consonant phoneme in all the PNG languages in which it has been analyzed as a phoneme...it is a feature of the syllable." She comes to this conclusion for several languages based upon glottal stop's limited distribution coupled with the reaction of educated native speakers: "In a survey conducted among tertiary and secondary students and teachers, their almost unanimous unsolicited opinion was that glottal's function was to cut the vowel so that it was not acting like a consonant. It was, to them, an intrinsic part of the vowel nucleus of the syllable."[36] Her conclusions are precisely the same as mine for Angave, which indicates that my analysis is not a novel proposal. Therefore, it seems to me that analyzing glottal stop as a suprasegmental in Angave is sound.

On the basis of this analysis those final glottal stops in 388-391 that were lost when followed by an internal word boundary will be maintained in underlying forms and deleted by rule (88-91 demonstrated that maintaining final glottal stop in underlying forms is necessary to account for the alternation between [ř] and [ɬ] in existential and dubitative formatives):

(392) GLOTTAL DELETION V ʔ # --> Ø
1 2 3 1 2 3

GLOTTAL DELETION states that final glottal stop is deleted when followed by an internal word boundary.

Analyzing glottal stop as a feature of the syllable affects the inventory of underlying syllables in Angave so that it includes a set not terminated by glottal stop and a terminated set. A syllable in Angave consists minimally of a nucleus containing a single vocalic segment, and maximally of (1) a nucleus containing a sequence of three vocalic segments, the last of which is terminated by glottal closure, and (2) a margin containing a single consonantal segment. All possible combinations in between minimal and maximal occur. The formula (C)(V)(V)v́ generalizes the possible underlying syllables in Angave and 393-412 illustrate the formula:

(393)	V	/o̲/	[ˊo̲]	'he'
(394)		/e̲'má/	[e̲'maʔ]	'moon'
(395)	v́	/'ʃnɬmɬ/	['i̲ʔnəmə]	'inside'
(396)		/'nɨɬá/	['ña'a̲ʔ]	'play'
(397)	CV	/'om̲ɬŋɬ/	['om̲ɬŋəʔ]	'garden'
(398)		/m̲ɨ'má/	[m̲ɨ'maʔ]	'forehead'
(399)	Cv́	/'aŋ̲ɬ/	['aŋəʔ]	'house'
(400)		/K̲ʷó/	['k̲woʔ]	'tongs, pole'
(401)	VV	/a̲ɨ/	['a̲ɨ]	'suddenly'
(402)		/a̲u'Pɬŋɬ/	[a̲u'ɓɬŋəʔ]	'a betel nut'
(403)	Vv́	/e̲ánaTɬnɬ/	[a?'naɽnə]	'he's being hit'
(404)		/'a̲ɪwɬ/	['a̲ɪʔwuʔ]	'tongue'

(405)	CVV	/'ĶoaPɬĶɬ/	['kʰɔɓʌɐʌʔ]	'a sugar cane'
(406)		/'Pɪeŋɬ/	['ɒyeŋəʔ]	'round house'
(407)	CVv́	/a'bɪá/	[aɱ'bya?]	'sweet potato'
(408)		/'maɪmaŋɬ/	['maɪʔmaŋəʔ]	'front teeth'
(409)	CVVV	/'TɪoaĶɬ/	['šɔɐʌʔ]	'a tree'
(410)		/TɪeaɪmónaTɬnɬ/	[saɪməʔ'naɽnə]	'you (pl) like'
(411)	CVVv́	/bɪaǵ/	[m'byauʔ]	'two'
(412)		/'Tɪeáye/	['šæʔye]	'on top'

It is possible to account for some dialect differences between Onapai and Angai where the differences arise from variant syllabifications of the same underlying forms. Derivations 413a-d illustrate:

(413)	(a) Onapai	(b) Angai
U.F.	/oTɔayɬ/	/oTɔayɬ/
MONOPHTHONGIZATION (295)	------	oTɔyɬ
SEMIVOWEL EPENTHESIS' (329)	oTɔwayɬ	-----
S.F.	[oɾ̌o'waɪyʊ]	[o'ɾ̌ɔyʊ]
	'let us chop (dl)'	

	(c) Onopai	(d) Angai
U.F.	/oPɬueaneyɬ/	/oPɬueaneyɬ/
/ɬ/ DELETION (352)	oPueaneyɬ	oPueaneyɬ
MONOPHTHONGIZATION (295)	---------	oPuæneyɬ
SEMIVOWEL EPENTHESIS' (329)	oPueyaneyɬ	--------
S.F.	[oɓwe'yaneyʊ]	[o'ɓwæneyʊ]
	'let us go down past (pl)'	

Because speakers of Onapai lect perceive the sequence of vowels as belonging to separate syllables, they insert semivowels in order to break up the vowel sequence. Angai speakers, on the other hand, coalesce the vowels together. The result in these verb

forms is that Onapai speakers have two surface syllables where Angai speakers have just one.

6 CONCLUSION

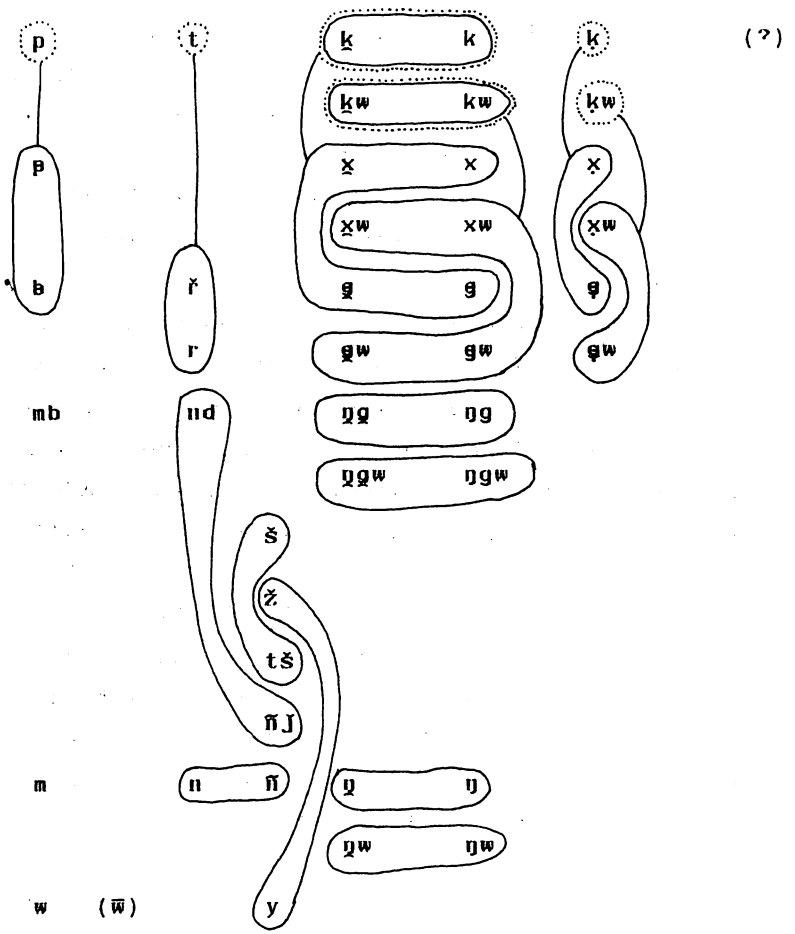
My initial attempt at describing Angave's sound system did not elucidate the system very well because I began with nominals and focused primarily on units and their distribution. When I started to focus on processes in order to account for variation in verbals, what I found helped elucidate the whole system as well. Furthermore, by focusing on processes I found guidelines for determining which of two or more possible analyses was most coherent within the system.

Not only does a focus on process elucidate the Angave sound system, but it also helps us see its dynamic state as a system in tension and undergoing further change. Tension between competing phonetic processes is especially evident in the way the mid central vowel is fronted, backed, raised, and lowered. But, sometimes it is difficult to decide whether a process in Angave is phonetically or morphologically conditioned. One example is the process (actually an interaction of processes) described by SPIRANTIZATION-STOP (87) that allows an abstract solution and requires minor adjustments to account for anomalous surface forms. Such cases indicate Angave's dynamic state as a system in transition. In addition, they are theoretically important, for as the language changes further they may help us to better understand universal mechanisms behind sound change.

APPENDICES

APPENDIX A

WORK CHART OF PHONES



Circles elongated horizontally indicate variation in point of articulation. Circles elongated or connected vertically indicate variation in the manner of articulation. Circles elongated or connected obliquely indicate variation in both point and manner of articulation.

APPENDIX B

CONTRASTS BETWEEN UNDERLYING CONSONANTS

/P/, /b/, /m/, /w/

(414)	/Ṕá/	['p̲a?]	'a bird'
(415)	/b̲á/	[m̲'b̲a?]	'a bamboo'
(416)	/m̲a/	['m̲a]	'take'
(417)	/w̲á/	['w̲a?]	'heart'
(418)	/P̲ɪ/	['p̲ɪ?]	'what?'
(419)	/b̲ɪ/	[m̲'b̲ɪ?]	'a bird'
(420)	/m̲ɪ/	['m̲ɪ?]	'evaluation'
(421)	/w̲ɪ/	['w̲ɪ?]	'another'
(422)	/'P̲ɨŋɨ/	['p̲ɨŋə?]	'cliff'
(423)	/'b̲ɨŋɨ/	[m̲'b̲ɨŋə?]	'that which comes'
(424)	/'m̲ɨŋɨ/	['m̲ɨŋə?]	'head'
(425)	/'w̲aŋɨ/	['w̲aŋə?]	'abika'
(426)	/'waTɨP̲ɨ/	['waɾəp̲ə?]	'loop'
(427)	/'Ḳʷɨ̲TɨP̲ɨ/	['ḳwuɾəb̲ə?]	'a bird'
(428)	/'Ḳʷɨ̲Tɨb̲ɨ/	['ḳwuɾəm̲bə?]	'mud'
(429)	/'anɨm̲ɨ/	['anəm̲ə?]	'mosquito'
(430)	/'ɪuTɨw̲ɨ/	['ɾuɾuw̲u?]	'a lizard'
(431)	/gu'P̲aḲɨ/	[ŋgu'b̲aɡʌ?]	'a shell'
(432)	/o'b̲aḲɨ/	[om̲'b̲aɡʌ?]	'many'
(433)	/Ḳo'm̲aḲɨ/	[ḳʰo'm̲aɡʌ?]	'a bird'
(434)	/Tɨ'w̲aḲɨ/	[ɾu'w̲aɡʌ?]	'a tree'
(435)	/TIɨ'P̲Iá/	[šɪ'p̲ya?]	'a tree'
(436)	/TIe'P̲Iá/	[še'b̲ya?]	'long'
(437)	/ma'b̲Iá/	[mam̲'b̲ya?]	'a snake'
(438)	/'mem̲Iá/	['mem̲ya?]	'crescent shell'
(439)	/'maw̲Ia/	['maᵘw̲ya?]	'chin'

(440) /'lP꜀/ ['lɓə?] 'sago'
(441) /'ob꜀/ ['ombə?] 'witch'
(442) /'lm꜀/ ['lmə?] 'croatan'
(443) /'lw꜀/ ['lwu?] 'woodpile'

/T/, /d/, /n/, and /y/

(444) /'T꜁ŋ꜀/ ['ř꜁ŋə?] 'a bird'
(445) /'d꜁ŋ꜀/ [n'd꜁ŋə?] 'thought'
(446) /'n꜁ŋ꜀/ ['n꜁ŋə?] 'a frog'
(447) /'yaŋ꜀/ ['yaŋə?] 'gift'

(448) /'Teŋ꜀/ ['řeŋə?] 'appendage'
(449) /'deŋ꜀/ [n'deŋə?] 'a tree'
(450) /'neg꜀/ ['neŋgə?] 'our'
(451) /'yeg꜀/ ['yeŋgə?] 'uphill'

(452) /'Téw꜀/ ['ře?wu?] 'fair weather'
(453) /'déw꜀/ [n'de?wu?] 'a curse word'
(454) /'neŋʷ꜀/ ['neŋwu?] 'a shell'

(455) /'T꜁w꜀/ ['řu?wu?] 'back'
(456) /'d꜁w꜀/ [n'du?wu?] 'mountain'
(457) /no'w꜀/ [no'wu?] 'a tree'
(458) /y꜁'w꜀/ [yu?'wu?] 'exposure'

(459) /T꜁á/ ['řa?a?] 'fire'
(460) /'d꜁á/ [n'da?a?] 'hair'
(461) /'n꜁á/ ['na?a?] 'a snake'
(462) /'yaP꜀/ ['yaɓə?] 'lie'

(463) /'PaT꜁/ ['paře?] 'Menya people'
(464) /'Pad꜁/ ['pandə?] 'a frog'
(465) /'mianⁿ꜁/ ['myanⁿə?] '(stone) axe'
(466) /'Pay꜁/ ['pa'yɪ?] 'a fish'

(467) /'aT̲ɬá/ ['aɾ̲a?a?] 'ear'

(468) /'áT̲ɬá/ ['at̲a?a?] 'singe'

(469) /'ud̲ɬá/ ['und̲a?a?] 'gum ball'

(470) /'an̲ɬá/ ['an̲a?a?] 'lacking'

(471) /'ay̲ɬá/ ['aˈy̲a?a?] 'a tree'

(472) /'aT̲ɬKɬ/ ['aɾ̲əgə?] 'earthworm'

(473) /'máT̲ɬmɬ/ ['mat̲ə?mə?] 'a taro'

(474) /'ad̲ɬK̲ɬ/ ['and̲ʌg̲ʌ?] 'a rat'

(475) /'an̲ɬmɬ/ ['an̲əmə?] 'mosquito'

(476) /'ay̲owɬ/ ['aˈy̲owu?] 'a banana'

/K/, /K^{w}/, /g/, /g^{w}/, /ŋ/, /ŋ^{w}/, and /w/

(477) /K̲ɬ/ ['k̲ɪ?] 'bat cry'

(478) /K̲^{w}ɬ/ ['k̲w̲ɪ?] 'breadfruit'

(479) /g̲ɬ/ [ŋ̲'g̲ɪ?] 'scar'

(480) /g̲^{w}ɬ/ [ŋ̲'g̲w̲u?] 'vine'

(481) /ŋ̲^{w}á/ [ŋ̲'w̲a?] 'sharpen'

(482) /w̲ɬ/ ['w̲ɪ?] 'another'

(483) /'TɪɬK̲ɬ/ ['šɪg̲ə?] 'trash'

(484) /'TɪɬK̲^{w}ɬ/ ['šɪg̲w̲u?] 'mushroom'

(485) /'wɪg̲ɬ/ ['wɪŋ̲g̲ə?] 'their'

(486) /'Tɪɬgwɬ/ ['šuŋ̲g̲w̲u?] 'lime'

(487) /'Tɪɬŋ̲ɬ/ ['šɪŋ̲ə?] 'star'

(488) /'Tɪɬŋ̲^{w}ɬ/ ['šɪŋ̲w̲u?] 'neck'

(489) /'Tɪɬw̲ɬ/ ['šɪw̲ɪ?] 'a plant'

(490) /Pɬ'K̲ɬ/ [pə'k̲ə?] 'honeybee'

(491) /'TɪɬK̲^{w}ɬ/ ['šuk̲w̲u?] 'a taro'

(492) /'TɬK̲^{w}ɬ/ ['ɾ̲ug̲w̲u?] 'peak'

(493) /'nɬg̲ɬ/ ['nɬŋ̲g̲ə?] 'mine'

(494) /'nɬgʷɬ/ ['nuŋgwu?] 'shell'
(495) /'nɬŋɬ/ ['nɬŋə?] 'a frog'
(496) /'Tɬŋʷɬ/ ['ruŋwu?] 'a tree'
(497) /'Tɬwɬ/ ['ruwu?] 'noise'

(498) /'ʃKɬá/ ['lka?a?] 'tree'
(499) /'ʃKʷɬá/ ['lkwa?a?] 'a tree'
(500) /'lKʷɬá/ ['lgwa?a?] 'a tree'
(501) /'lgɬá/ ['lŋga?a?] 'wash'
(502) /'lgʷɬá/ ['lŋgwa?a?] 'submerge/bury'
(503) /'ɬwɬá/ ['uwa?a?] 'planting'

/K/, /Kʷ/, /Ķ/, and /Ķʷ/

(504) /'lKɬ/ ['lgə?] 'a tree'
(505) /'ʃKɬ/ ['lkə?] 'feces'
(506) /'ʃKʷɬ/ ['lkwu?] 'leaf'
(507) /'lKɬ/ ['lᵊgʌ?] 'a tree'
(508) /e'Kʷá/ [eᵊ'gwa?] 'a bark skirt'

(509) /'KɬPɬŋɬ/ ['kəbɬŋə?] 'clouds gathering'
(510) /Kʷe'PaĶɬ/ [kwe'baɡʌ?] 'a tree'
(511) /'KɬmɬĶɬ/ ['kʰʌmʌgʌ?] 'a yam'
(512) /'KʷɬTɬPɬ/ ['kwuřəbə?] 'a bird'

(513) /Pɬ'Kɬ/ [pə'kə?] 'honeybee'
(514) /'TlɬKʷɬ/ ['sukwu?] 'a taro'
(515) /'TɬKwɬ/ ['řugwu?] 'peak'
(516) /'TɬKɬ/ ['řʌgʌ?] 'different'
(517) /Tlɬ'Kʷɬ/ [šo'kwu?] 'a tree'

(518) /o'Ká/ [o'ga?] 'a fish'
(519) /o'KʷoKʷɬó/ [o'gwogwo?o?] 'a vine'
(520) /o'Ká/ [o'ga?] 'a bamboo'
(521) /Tɬ'Kʷa?/ [řo'gwa?] 'banana'

/m/, /n/, /ŋ/, and /ŋʷ/

(522) /'mɨnɨé/ ['mənɛ?ɛ?] 'brain'
(523) /'nɨmɨTɨ/ ['nəməř ə?] 'a banana'
(524) /'ŋɨŋɨé/ ['ŋɨŋɛ?ɛ?] 'locust'
(525) /ŋʷa'Tlɨgʷɨ/ [ŋwa'tšuŋgwu?] 'a vine'

(526) /'meaaTɨnɨ/ ['mæɾnə] 'he is getting'
(527) /'neaaTɨnɨ/ ['næɾnə] 'he is hitting me'
(528) /'ŋʷeaaTɨnɨ/ [ŋ'wæɾnə] 'he is sitting'

(529) /'anɨmɨ/ ['anəmə?] 'mosquito'
(530) /'yoTɨnɨ/ ['yoɾnə?] 'a lizard'
(531) /'amɨŋɨ/ ['amɨŋə?] 'breast'
(532) /'anɨŋʷɨ/ ['anuŋwu?] 'a vine'

(533) /'amɨ/ ['amə?] 'cyanide nut'
(534) /'Ḵʷanɨ/ ['ḳwanə?] 'a tree'
(535) /'waŋɨ/ ['waŋə?] 'abika'
(536) /'Tlaŋʷɨ/ ['šaŋwu?] 'shoulder'

(537) /'lmɨ/ ['lmə?] 'croatan'
(538) /'Pɨnɨ/ ['pənə?] 'a tree'
(539) /'Pɨŋɨ/ ['pɨŋə?] 'cliff'
(540) /Pɨ'ŋʷɨ/ [puŋ'wu?] 'a broad leafed plant'

(541) /'Tlɨmɨ/ ['šɪ?mə?] 'nose'
(542) /'Pɨnɨ/ ['pə?nə?] 'hid'
(543) /'Tlɨŋɨ/ ['šɪ?ŋa?] 'stone'

CONTRASTS BETWEEN UNDERLYING VOWELS AND VOWEL SEQUENCES

/l/, /u/, /e/, /ɨ/, /o/, /a/, /ea/, /oa/, /al/, and /au/

(544) /'lŋɨ/ ['lŋə?] 'bird'
(545) /'uŋɨ/ ['uŋə?] 'that which went'
(546) /'eŋɨ/ ['eŋə?] 'bone'

(547)	/'nɨŋɬ/	['nɨŋə?]	'a frog'
(548)	/'oŋɬ/	['oŋə?]	'a vine'
(549)	/'aŋɬ/	['aŋə?]	'house'
(550)	/'TIɪŋɬ/	['šɪŋə?]	'star'
(551)	/'TIeŋɬ/	['šeŋə?]	'a cane'
(552)	/'TIɨŋɬ/	['šɨŋə?]	'new'
(553)	/'TIoŋɬ/	['šoŋə?]	'drum'
(554)	/'TIaŋɬ/	['šaŋə?]	'heavy'
(555)	/'ɪKɬá/	['ɪka?a?]	'tree'
(556)	/'ʉdɬá/	['ʉnda?a?]	'gum ball'
(557)	/'enɬá/	['ena?a?]	'a vine'
(558)	/'oPɬá/	['opa?a?]	'a tree'
(559)	/'aTɬá/	['ařa?a?]	'ear'
(560)	/'æaTɬá/	['æřa?a?]	'string'
(561)	/'mɪŋɬ/	['mɪŋə?]	'that which is dug'
(562)	/'yʉnɬ/	['yʉnə?]	'kindling'
(563)	/'deŋɬ/	[n'deŋə?]	'a tree'
(564)	/'mɨŋɬ/	['mɨŋə?]	'head'
(565)	/'moŋɬ/	['moŋə?]	'that which is thrown'
(566)	/'meaŋɬ/	['mæŋə?]	'cooing'
(567)	/'aɪKɬ/	['aɪgə?]	'reed'
(568)	/'TIɪKɬ/	['šɪgə?]	'dirt'
(569)	/'TIʉyɬ/	['šʉžɪ?]	'a tree'
(570)	/TIe'KaĶɬ/	[še'gagʌ?]	'command'
(571)	/'TIɨĶɬ/	['šəgʌ?]	'bamboo'
(572)	/'TIoĶɬ/	['šogʌ?]	'a yam'
(573)	/'TIaĶɬ/	['šagʌ?]	'salt'
(574)	/'TIoaĶɬ/	['šɔgʌ?]	'a yam'
(575)	/wɪ/	['wɪ?]	'another'
(576)	/wʉ́/	['wʉ?]	'one (water gender)'
(577)	/wɛ́/	['wɛ?]	'hand'

(578)	/wo/	['wo]	'one (masc)'
(579)	/wá/	['wa?]	'heart'
(580)	/weá/	['wæ?]	'barrier'
(581)	/waú/	['wau?]	'two (masc)'
(582)	/'ḲɬmɬḲɬ/	['ḳʰʌmʌgʌ?]	'a yam'
(583)	/'ḲoPɬḲɬ/	['ḳʰobʌgʌ?]	'a bamboo'
(584)	/'ḲaPɬḲɬ/	['ḳʰabʌgʌ?]	'cup' (borrowed)
(585)	/'ḲoaPɬḲɬ/	['ḳʰɔbʌgʌ?]	'a sugar cane'

CONTRASTS BETWEEN /T, d, n/ and /Tl, dl, nl/

/T/ and /Tl/

(586)	/'Tɬŋɬ/	['ɾɬŋə?]	'a bird'
(587)	/'Tlɬŋɬ/	['šɬŋə?]	'new'
(588)	/'Tɬá/	['ɾa?a?]	'fire'
(589)	/'Tlɬá/	['ša?a?]	'roofing'
(590)	/'Táɬ/	['ɾa?w̄ə?]	'garbage pile'
(591)	/'Tláɬ/	['ša?w̄ə?]	'thigh'
(592)	/'TɬmɬKɬ/	['ɾəməkə?]	'a yam'
(593)	/'TlɬmɬKɬ/	['šɪməkə?]	'hiccup'
(594)	/ɬ'Táɬ/	[ɬ'ta?w̄ə?]	'platform'
(595)	/ɬ'Tláɬ/	[ɬ'tša?w̄ə?]	'a tree'
(596)	/Ḳʷa'Tɬŋʷɬ/	[ḳwa'tuŋwu?]	'sink hole'
(597)	/Ḳʷá'Tlɬŋʷɬ/	[ḳwa'tšuŋwu?]	'leaf from a bamboo'

/d/ and /dl/

(598)	/dɬ/	[n'də?]	'brush pile'
(599)	/dlá/	[ñ'ʝa?]	'a tree'

(600) /deɬ/ [n̪'deyɪ] 'pick! (impv s)'
(601) /dlɬ/ [ñ̪'ʃlyɪ] 'fasten! (impv s)'

(602) /'Padɬ/ ['pan̪dəʔ] 'a frog'
(603) /'madlɬ/ ['maɲ̃ʃɪʔ] 'an oppossum'

(604) /'udɬá/ ['un̪daʔaʔ] 'gum ball'
(605) /'odlɬó/ ['oɲ̃ʃoʔoʔ] 'a palm'

/n/ and /nl/

(606) /'n̪ɬá/ ['n̪aʔaʔ] 'a snake'
(607) /'nlɬá/ ['ñ̪aʔaʔ] 'play'

(608) /n̪ɬ'wɪbɬḴɬ/ [n̪u'wɪmbʌgʌʔ] 'common bird of paradise'
(609) /nlɬ'wamɬŋɬ/ [ñ̪u'wamɬŋəʔ] 'a bird'

(610) /'n̪ɬŋɬ/ ['n̪ɬŋəʔ] 'a frog'
(611) /'nlɬŋɬ/ ['ñ̪ɬŋəʔ] 'like'

(612) /uyl'n̪á/ [užl'n̪aʔ] 'a bird'
(613) /l'nlá/ [l'ñ̪aʔ] 'rain'

(614) /'an̪ɬŋʷɬ/ ['an̪uŋ̪wuʔ] 'a vine'
(615) /Pe'nlɬŋʷɬ/ [pe'ñ̪uŋ̪wuʔ] 'beetle nut spit'

FOOTNOTES

* This paper was submitted to the faculty of the graduate school of the University of Texas at Arlington in partial fulfillment for the degree of master of arts in linguistics in May, 1983. Acknowledgement is made to the supervisors over the project Donald A. Burquest, Jerry A. Edmondson, and Ellis W. Deibler. In addition, Joy Lloyd and Dorothy James gave helpful stimulus during the early stages of research for the language.

Throughout the paper the following conventions and abbreviations are used:

[ ]	phonetic transcription (surface form)
/ /	underlying form
( )	implied or redundant information
' '	English gloss
~	varying with
*[ ]	non-occurring phonetic form
*/ /	non-occurring underlying form
*C, *V	proto-form
+	formative boundary
#	(utterance) internal word boundary
##	(utterance) external word boundary
$	syllable boundary
[//]	the pause associated with a phrase boundary or greater
[ˈ], / ˈ/	An apostrophe within phonetic and underlying transcriptions represents stress on the following syllable.
C	a consonant
V	a vowel
C^{w},C^{y}	Raised letters in underlying forms represent complex segments.
Ç	a syllabic consonant
/V́/	An acute accent mark over a vowel represents a glottal stop that terminates the vowel in underlying representations.
U.F.	underlying form
S.F.	surface form
gend m	gender marker
fem	feminine
masc	masculine
com	common, i.e. both masculine and feminine
nom	nominal
vb	verbal
infin	infinitive (medial verb)
impv	imperative
pres	present tense

fut	future tense
past	past tense
cust	customary tense
cont	continuous action
immed	immediate
dist	distant
1s	first person singular
2s	second person singular
3s	third person singular
1dl	first person dual
2dl	second person dual
3dl	third person dual
1pl	first person plural
2pl	second person plural
3pl	third person plural
/ɬ/ DELETION (352)	Names of the processes that are formalized as rules for Angave are printed in capital letters and numbered consecutively throughout the paper.
/ɬ/ DELETION' (363)	An apostrophe following a rule is to be read 'prime' and it indicates that (1) the rule is a reformulation of a previous statement of the process, or (2) it is another rule which describes a process very similar to one stated previously.
'round'	Features are enclosed within single quotation marks.

[1]R. Lloyd (1973:35) makes the following perceptive cultural observations about the Angan peoples who include the Angave:

> The Anga people basically belong to the mountains. They are usually short, wiry, virile and noted for their warlike tendencies. They are forceful in manner and speech.
>
> Dress throughout the area is fairly uniform. Traditionally men wear a bushy reed sporran-like skirt, a small bark cape over the buttocks and in most tribes tied loosely around the neck with home made string. An additional bark cape is often suspended from the crown of the head. Cassowary bones are worn across the top of the sporran skirts. Stomach bands, chest bands and arm bands above the elbow are commonly worn. Women wear several bark capes and many necklaces, particularly when younger. All ages and both sexes have shaven heads except for a tuft at the crown.

> The Anga practice shifting agriculture within a defined area. They raise pigs and dogs. In the past it seems that hunting played a greater role in food gathering techniques.
>
> The Anga are animists who give special importance to the sun and moon. They are patrilineal and usually have patrilocal residence. They live in family houses and in most areas used to live in hamlets of about four houses. They practice sympathetic garden magic, and shamans who control healing spirits 'exorcise' sickness. Sorcery is practised to a lesser degree than in other highland areas. There are no chiefs as such, but in time of war they look to fight-leaders, in sickness to shamans, in time of ceremonies to qualified men. The younger boys undergo a complex series of initiations before they marry and establish a family house of their own.

[2]R. Lloyd (1973:33) states that "the relationships between the languages were established by the comparison of lexical lists ranging from 161-179 words."

[3]For the value of phonetic representations of consonants see sec. 3.2; of vowels sec. 4.2. Stress is marked on all surface forms, but only on multisyllabic nominals in underlying forms, as elsewhere it is predictable. Tone has not been marked. See Speece and Speece, 1982, for a description of Angave's word tone system.

[4]Within English glosses for Angave words 'a' is to be read 'a species of' or 'a type of'.

[5]Only simple verb stems where sequences of vowels are within the domain of a single surface syllable (see sec. 5.0 for the definition of a syllable in Angave) are discussed here. In complex verb stems there is the possibility of sequences of up to six vowels, but since they are heterosyllabic they are not relevant to this discussion.

[6]For Baruya, another Angan language, closed syllables were set up by Joy Lloyd (1970:33-48), despite the fact that the only univalent syllable patterns in the language are CV and V.

[7]Despite the scarcity of heterorganic consonant clusters unambiguously filling a single syllable onset slot in several other languages of the Angan Language Family, CC or CS (where S=semivowel) sequences have been set up (P. Healey (ed.), 1981:9,51,83,97).

[8]The diacritic over vowels is glottal closure (cf. sec. 5).

[9]It may be argued that /-ɨ-/ is the stem of the verb meaning 'do' and that all /ɨ/-stem verbs are complex stems. This seems not

to be the case as 'do' follows the paradigm of /e/-stem verbs, only surfacing with an /ɨ/ in the passive/reflexive forms. In addition, it is hard to see a semantic relationship of 'do' plus another stem in many /ɨ/-stem verbs.

[10]27c,d are the only known examples of the sequence [[+anterior]$^{C}_{w}$] outside of borrowed words.

[11]/ɨ/ DELETION (352) is formulated in sec. 4.3.4 /ɨ/--->Ø/__V.

[12]See sec. 3.3.1 for a discussion of the archisegments represented by /P, T, K, etc/.

[13]The prenasalization of /d/ in the surface form is accounted for by the rule PRENASALIZATION (181).

[14]A process known as syneresis, the combining of similar elements (i.e. y+i--->y), could be appealed to here and [y] could be analyzed as */yɨ/, */yʸ/, or */yy/.

[15]It may be argued that it is questionable for the feature nasal, a redundant feature of voiced stops, to be selected as the most general and characteristic feature differentiating voiced stops from the obstruents /P, T, K, Kʷ/. The objection is not valid because non-nasalized obstruents are archisegments whose underlying specifications include values for neither 'voice' nor 'continuant'. Therefore the feature 'nasal' efficiently does what neither 'voice' nor 'continuant' could do, and that is make the necessary opposition between nasalized and non-nasalized obstruents. To use the feature 'nasal' to distinguish between two sets of stops is not a novel proposal, for Kiparsky (1971:617) in discussing rule re-ordering in Faroese describes a rule, INTERVOCALIC SPIRANTIZATION, that operates on non-nasal non-continuants, i.e. $\begin{bmatrix} -\text{continuant} \\ -\text{nasal} \end{bmatrix}^{C}$, where the feature 'nasal' is used to maintain underlying opposition between two sets of stops.

[16]/ɨ/ REGRESSIVE ROUNDING (251): /ɨ/--->[u]/__$\begin{Bmatrix} C^{w} \\ w \end{Bmatrix}$.

[17]Within an utterance, the pause associated with a phrase boundary in largo speech is sufficient to prevent the voiceless stops that follow from weakening to voiced fricatives. Rather than

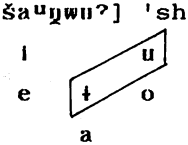
describe what boundaries in the several speech styles are capable of preventing this process of weakening, I state the rule with the one boundary that transcends speech styles, the external word boundary.

[18]Word final glottal stop is deleted before internal word boundaries as is predicted by the rule GLOTTAL DELETION (392).

[19]Dressler's argument that *p is weaker because it has more reflexes than other voiceless stops is not beyond dispute. The opposite could also be true. If *p is stronger than the other voiceless stops, one could conclude that it resisted sound changes longer and preserves reflexes which for the others were lost because of their weakness. If this latter approach is true for Angave, then [p]~[p̣] is not a synchronic innovation of lenition, but rather the last vestige of a merger between voiceless stops and fricatives.

[20]The phonetic sequence *[əCw] never occurs in Angave. Consider 1-6:

	(a)		(b)		(c)	
(1)	['šɪŋə?]	'star'				
(2)	['šɪŋwu?]	'neck'			['šuŋwu?]	'eye'
(3)	['šeŋə?]	'a kanda'	['šɛŋə?]	'new'	['šoŋə?]	'drum'
(4)	['ḳʰeŋwu?]	'crooked'			['ǩoŋwu?]	'a yam'
(5)			['šaŋə?]	'heavy'		
(6)			['šaᵘŋwu?]	'shoulder'		



Note that the front vowels /ɪ/ and /e/ are followed by both [ŋ] and [ŋw] (1-4a). The central and back vowels, however, reveal a distributional gap in relation to [ŋ] and [ŋw]. The mid central vowel does not precede [ŋw] (4b); and the high back vowel is never (except across formative boundaries in verbals) followed by [ŋ]

(1c). As stated in section 4.3.2, it appears from variation in verb formatives that this assimilation is regressive, [u] conditioned by [Cw]. I have found only one word which contradicts this analysis. The word for 'foot, leg' ['šuɣwu?] is related to [šu'řeŋə?] 'tip of toes'; and if the former has /'T̲l̲ɬK^{w}ɬ/ as its underlying form and the latter /T̲l̲u̲'Teŋɬ/, then the stem meaning 'foot' has not been represented consistently. On the basis of [šu'řeŋə?] we might say that the [u] preceding [Cw] is being (or has already been) reanalyzed as an underlying /u/ which conditions labialization in the following consonants. If this is so, then the variation in verb stems, where the assimilation is demonstrably regressive, must be considered morphological variation. In addition, when /-ŋɬ/, a nominalizer, is attached to the verb stem /u-/ 'go', it surfaces as ['uŋə?] 'that which went', and not *['uŋwu?]. So in verbals, at least, there is no basis for asserting that /u/ causes rounding in following consonantals. But what about nominals? In attempting to resolve this issue, I tested new literates and found that they could read ['šuɣwu?] from either /'Tl̲ɬK^{w}ɬ/ or */'Tl̲uKɬ/. It appeared inconsequential where the rounding was represented. In order to be consistent with the variation in verb formatives, I adopted the former solution. I would not be surprised, however, to find other words like [šu'řeŋə?] which indicate that underlying forms are being reanalyzed. Synchronically there may be ambiguity even among the Angave as to whether the [u] or [Cw] is underlying, especially in view of the paucity of clear cases upon which to formulate a rule. And new literates reflect this hunch because when writing [uCw] they alternate between l̲Cw̲ and u̲Cw̲.

[21]For a discussion of 'mirror image notation' see Langacker (1972:844f).

[22]The ordering could possibly be eliminated by a further combination of the rules as stated, but such a combination would require numerous restrictions and be very cumbersome. Rather than elucidate, it would actually obscure the processes involved.

[23]Frequently the sequence /ɬɬ/ surfaces as either [ɪʔɪʔ] or [ɪʔyɪʔ] depending upon idiolect. Some speakers (usually the elder adults) prefer one variant for some words while either is acceptable for others. Since younger speakers have less rigid preferences and usually accept either variant, it appears that historically *ɪʔyɪʔ and *ɪʔɪʔ contrasted, but the contrast is now being neutralized.

[24]At present, words ending in [...aᵘʔwuʔ] are analyzed as /...áwɬ/, though they could also be */...oáɬ/ or */...aúɬ/. Evidence corroborating /...áwɬ/ can be seen in the compound noun ['aᵘʔwuʔ] /'áwɬ/ 'taro set' which comes from ['aʔw̄əʔ] /áɬ/ 'taro' plus ['uwuʔ] /'ɬwɬ/ 'sprout'.

[25]Not all /e/-stem verbs undergo rule 270 in Wiokwa. It is only those in which the C preceding the stem vowel is a bilabial. /ḳeaTɬnɬ/ [ḳʰæɽnə] 'he is grabbing', from /nɬḳeTɬ/ 'to grab', is an /e/-stem verb, but does not undergo 270 because it has a non-labial segment before the stem vowel.

[26]Wiokwa lect has extended the application of MONOPHTHONGIZATION (295) to include the high back vowel so that /PɬuaTɬnɬ/ 'he is passing by' is realized as ['pɔɽnə].

[27][æ] and [ɔ] in non-verbals could also be handled as the reverse of the sequences posited on the basis of morphological changes yet to be presented.

[28]Heterosyllabic sequences of four, five and six underlying vowels are not arrayed here for they reach the surface by the same rules as sequences of two and three vowels, and we would gain no additional insights by including them.

[29]SEMIVOWEL EPENTHESIS is a morphological rule limited to verbals, though it appears at first glance that it could be extended to non-verbals as well. Consider 1-7:

(1) ['ɾu?wu?] 'back'

(2) ['mu?wu?] 'sugar cane top'

(3) ['u?wu?] 'steal'

(4) ['mo?wu?] 'a mushroom'

(5) ['šo?wu?] 'a tree'

(6) ['wau?wu?] 'hornet'

(7) [u'ř̆au?wu?] 'ashes'

In 1-7 a round vowel terminated by glottal stop in the penult is always followed by [wV?] in the ultima. Many non-verbals occur, however, with a non-round vowel terminated by glottal closure and followed by [wV?]:

(8) [ye?'wu?] 'nest'

(9) ['ř̆e?wu?] 'fair weather'

(10) ['wæ?wu?] 'a marsupial'

(11) ['šɪ?wu?] 'wart'

(12) [o'pi?wu?] 'a plant'

(13) ['waɪ?wu?] 'stairs'

(14) [æɻaɪ?wu?] 'a reed'

If SEMIVOWEL EPENTHESIS held true for nominals as well, we would expect *[yV?] in the ultima of 8-14 because a front unround vowel fills the nucleus of the preceding syllable.

[30]One of the rules used in the derivation, VOWEL REDUCTION (350), is discussed later in this section. Also, 318b with [aɪ] preceding the round semivowel is most likely the result of analogical leveling.

[31]Notice that in column e /Tɬ-/ 'say' has a change in the stem vowel. I would expect */Tɬoɬ/, which would meet the structural description of VOWEL COPY (259) and surface as *,['ř̆o?owu]. For reasons I cannot account for, the /ɬ/ has strengthened to /a/ which no longer meets the structural description of VOWEL COPY. This change is also reflected by idiolect, for a few speakers do not say ['ř̆ə?ənə] 'I said'. Instead, they say ['ř̆a?anə] 'I said'.

[32]GLOTTAL DELETION (392) operates first and deletes glottal stop before an internal word boundary.

[33]NASAL-FLAP COALESCENCE has been formulated so that it only operates across formative boundaries. It's application has not been extended to account for all occurrences of [nd]. Potentially, all the prenasalized stops could be analyzed as a homorganic nasal and non-nasal obstruent with a mid central vowel in between them, but there is no evidence outside of NASAL-FLAP COALESCENCE for such an analysis. Even a limited extension of the rule, so that a formative boundary is no longer specified in its structural description, is unwarranted. Consider the ambiguity that would result in underlying forms from such an extension: /nɬTɬaTɬnɬ/ 'he is saying to me' and /dɬaTɬnɬ/ 'he is picking (beans)' would both have the underlying form of the former if the application of NASAL-FLAP COALESCENCE was extended.

[34]In Baruya, Kapau, and Ángaatɬha of the Angan Language Family (P. Healey ed., 1981:6,95,52) glottal stop has been analyzed as an underlying consonantal.

[35]Those studying glottal stop's relationship to the Ampeeli-Wojokeso sound system (P. Healey, ed., 1981:85) have concluded:

> As glottal stop only occurs syllable final and does not contrast with any other stop in this position, it is interpreted here as a prosodic feature, glottal closure of the syllable nucleus rather than as a consonant phoneme. Thus two new syllable types with a complex nucleus are set up, the definition of the syllable being extended to include an obligatory nucleus of a vowel or vowel with glottal closure.

[36]Cochrane (1977:45) also states that in some languages where glottal stop has been represented sequentially (on the line like other consonantals) when it appears to her it functions on the syllable level, native writers have had difficulty in learning where to write it. One national writer, in whose language glottal stop has been symbolized as a 'q', wrote both 'Vq' and 'qV' for [Vʔ], which implied to her that there is an intrinsic relationship between glottal stop and vowels in his language. Cochrane thus concludes (for languages where glottal stop functions on the syllable level) that it is best for glottal stop to be symbolized

orthographically as a diacritic over vowels rather than following them sequentially on the line.

REFERENCES

Bruck, Anthony; Fox, Robert A.; and Lagaly, Michael W. (ed.). 1974. Natural phonology parasession. Chicago: Chicago Linguistic Society.

Catford, J.C. 1974. "Natural sound changes: some questions of directionality in diachronic phonetics". In: Bruck; Fox; and Lagaly (ed.) 1974: 21-29.

Chen, Matthew Y. 1974. "Natural phonology from a diachronic viewpoint". In: Bruck; Fox; and Lagaly (ed.). 1974: 43-80.

Chomsky, N.; and Halle, M. 1968. The sound pattern of English. New York: Harper and Row.

Cochrane, Anne. 1977. Alphabet design for Papua New Guinea languages. M.A. Thesis. University of Papua New Guinea.

Dingwall, W.O. (ed.). 1971. A survey of linguistic science. College Park: Linguistics Program, University of Maryland.

Dressler, Wolfgang. 1974. "Diachronic puzzles for natural phonology". In: Bruck; Fox; and Lagaly (ed.). 1974: 95-102.

Foley James. 1977. Foundations of theoretical phonology. Cambridge: Cambridge University Press.

Franklin, Karl J. (ed.). 1973 The linguistic situation in the Gulf District and adjacent areas, Papua New Guinea. Canberra: Australian National University [Pacific Linguistics Series C-No. 26].

Givón, Talmy. 1974. "Rule un-ordering: generalization and de-generalization in phonology. In: Bruck; Fox; and Lagaly (ed.). 1974: 103-115.

Healey, Phyllis (ed.). 1981. Angan languages are different, four phonologies. Ukarumpa, Papua New Guinea: Summer Institute of Linguistics [Asian-Pacific Series 12].

Hooper, Joan B. 1976. An introduction to natural generative phonology, New York: Academic Press, Inc.

Hyman, Larry M. 1973. "The feature [grave] in phonological theory". Journal of Phonetics vol. 1 no. 4: 329-337.

_____. 1975. Phonology, theory and analysis. New York: Holt, Rinehart, and Winston.

Kenstowicz, Michael; and Kisseberth, Charles. 1979. Generative phonology, description and theory. New York: Academic Press, Inc.

Kiparsky, Paul. 1971. "Historical linguistics". In: Dingwall (ed.) 1971: 577-649.

Labov, William. 1972. Sociolinguistic patterns. Philadelphia: University of Pennsylvania Press.

Langacker, Ronald W. 1972. "Mirror image rules II: lexicon and phonology". Language vol. 45 no. 4: 844-862.

Lloyd, Joy. 1970. "A fourth analysis of Baruya consonants." Linguistics 1970: 33-48.

Lloyd, Richard G. 1973. "The Angan Language family". In: Franklin (ed.) 1973: 31-107.

Saporta, S. 1965. "Ordered rules, dialect differences, and historical processes". Language 1965: 218-224.

Schane, Sanford A. 1973. Generative phonology. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.

_____. 1974. "How abstract is abstract?". In: Bruck; Fox; and Lagaly (ed.) 1974: 297-317.

Shuy, R.; Bailey, C.J. (ed.). 1974. Toward tomorrow's linguistics. Washington, D.C.: Georgetown University Press.

Speece, Rick and Marilyn. 1981. Angave phonology. MS Ukarumpa, Papua New Guinea: Summer Institute of Linguistics.

Vennemann, T. 1974a. "Words and syllables in natural generative grammar". In: Bruck; Fox; and Lagaly (ed.) 1974: 346-374.

_____. 1974b. "Phonological concreteness in natural generative grammar". In: Shuy; and Bailey (ed.) 1974: 202-219.

HARUAI VERB STRUCTURE AND LANGUAGE CLASSIFICATION IN THE UPPER YUAT

Bernard Comrie

University of Southern California

ABSTRACT

Much work on the genetic classification of Papuan languages has rested on lexical comparison. More recently, greater weight has been placed on typological structural properties. However, both lexicon and general typological features are notoriously subject to areal diffusion independent of genetic affiliation. By contrast, bound morphology is much more resistant to borrowing, and therefore forms a securer basis for genetic comparison. While Haruai (Wiyaw, Waibuk) shares much vocabulary and many general typological features with languages of the Kalam family, detailed analysis of Haruai morphology shows that it clearly belongs to the Piawi family and that similarities to languages in the Kalam family must be the result of areal diffusion. Future work on the genetic classification of Papuan languages has as its prerequisite the availability of good synchronic descriptions of the individual languages.