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FOREWORD

It is indeed gratifying to recognize the degree of acceptance the *Kansas Working Papers in Linguistics* has come to enjoy, and this is especially true for the series of *Studies in Native American Languages*. Even before the call for papers went out in the fall, we had received inquiries from prospective contributors, and the response to the call itself was remarkable in quality as well as diversity.

This year the *KWPL* marks its first decade of existence, and we are publishing two numbers. Number one is devoted to theoretical issues, general linguistcs and old-world languages, while number two is the fourth in the *Studies in Native American Languages* series. This number includes articles representing seven different language families from all over North America (Uto-Aztecan, Muskogean, Yuman, Siouan, Otomanguan, Athabaskan and Algic), and a great deal of original scholarship.

We wish to thank the contributors, both those whose papers appear in this volume, and those whose papers we did not include. We also wish to thank the faculty of the Linguistics department of the University of Kansas for their support and encouragement for the *KWPL* throughout the year.

ON PREDICTING VOICELESS VOWELS IN COMANCHE

James L. Armagost

Abstract: Comanche voiceless vowels have been analyzed by some authors as phonemic, by others as predictable. This paper reviews the controversy and concludes that voiceless vowels are largely, but not entirely, predictable. Included are several types of data that have received no mention in previous works.

As pointed out by Goss some years ago, certain linguists have continued to attribute a contrastive or phonemic status to voiceless vowels in Comanche (Goss 1970). Others, such as Goss himself and Miller (1973, 1974), believe that the voiceless quality is redundant. This is the position taken earlier by Jakobson, Fant, and Halle (1952), though they present no data and refer to no published analyses in support of such a position. In this paper I will present a brief review of the controversy, taking Canonge (1957) and Miller (1973) as epitomizing the opposing views. I will include data not mentioned by either and, in summarizing what is known about the language, attempt to present an analysis that is as reasonable as possible, given various alternatives.[1]

Notation is largely straightforward: capitals represent voiceless segments, y is a high back unrounded vowel, v and f are bilabial, r is [ɾ], c is an alveolar affricate, j is a palatal glide, and ´ marks primary stress. Material in slashes / / is phonemic, the meaning of "phonemic" varying somewhat throughout the paper. Material not in slashes is phonetic but does not necessarily contain all systematic aspects of pronunciation. The transcription systems used by quoted sources have, in certain cases, been modified in nonessential ways.

Canonge's 1957 article is an interesting example of then current phonemic theory put into practice. After a short introduction there are four sections, three of which are relevant to the present paper. Sections 1 and 2 are meant to support Canonge's claim that 'voiceless... vowels in syllabic position are phonemic' (p63), and section 3 takes voiceless vowels in nonsyllabic position to be phonemic /h/. In this third section Canonge points out the noncontrastive phonetic characteristics of certain voiceless segments:

1) wíInu /wihnu/ 'then' séEka /sehka/ 'those (obj.)'
Aá?nii /ha?nii/ 'beaver' Yýykɪ /hyykɪ/ 'brush arbor'

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Since these pre- and postvocalic voiceless segments never contrast with the timbre of the adjacent voiced vowel, it is most reasonable to take them as realizations of a single phoneme /h/.

Sections 1 and 2 bear directly on the question of whether voiceless vowels (in syllabic position) are phonemic. In 1, Canonge gives minimal pairs of the following sort:[2]

2) u kú?ok^{w}ek^{w}ai u? 'she went to render it'
u kú?ok^{w}Ek^{w}ai u? 'she rendered it and went on,' 'she went rendering it'[3]
máyakeki u? 'he came to play'
máyakEki u? 'he played and came on,' 'he came playing'
u hánikyki u? 'he came to fix it for him'
u hánikYki u? 'he fixed it for him and came on,' 'he came fixing it for him'

His account of the voiceless vowels in these forms is very interesting. He believes that in each instance the verb stem is followed by a morpheme comprised phonetically (sic) of stem final unvoicing. This morpheme carries the semantic 'implication' of sequential (or simultaneous--see fn. 1) action. I interpret this to mean that the verb in the second example of 2) would have a morphologically complex stem that can be represented in the following way:

3) /ok^{w}e/ + X 'flowing or liquification resulting in or occurring simultaneously with the action indicated by the following morpheme' (p64)

Canonge says the devoicing of the vowel preceding what I am calling morpheme X is a phonetic effect, but he must mean morphophonemic. That is, the morphophonemic 'stuff' of X consists of a substitution of the corresponding voiceless vowel phoneme for the preceding voiced vowel phoneme of the verb stem. The phonetic realization of this morpheme then follows naturally from the morphophonemic, i.e. the voiceless vowel phoneme is realized as a voiceless vowel.

But Canonge also claims that no phonological or morphological conditioning factors are present in the data of 2), and stresses the contrast in voiced versus voiceless vowels (p64). Surely no phonological or morphological conditioning factors are present <u>phonetically</u> but does it follow that voiceless vowels are phonemic? As I reconstruct his reasoning, I understand Canonge to say that morpheme X results in the substitution of a voiceless vowel phoneme for the corresponding voiced vowel phoneme. This assumes the prior existence of voiceless vowel phonemes--that is, we have a morphophonemic alternation conditioned by morpheme X. Therefore, we must ask what the independent evidence is for these phonemes without regard to the data of 2).

Before moving to this question, however, there is another problem involving the data. Canonge provides no justification for his claim that what I am calling morpheme X devoices the preceding vowel. Is it not possible that an inverse of X, let us say X', voices a preceding vowel? In such an analysis we would have the following:

4) /ok^{W}E/ 'flowing or liquification resulting in or occurring simultaneously with the action indicated by the following morpheme'

/ok^{W}E/ + X' 'flowing or liquification with purpose directed toward the motion indicated in the following morpheme' (p63-4)

Phonemically, the first entry in 4) would be /ok^{W}E/ but the second would be /ok^{W}e/ after the morphophonemic substitution conditioned by X'. It may be that Canonge had reasons for selecting the prior analysis of such data, but in any case he states none.

Note also that application of the strictest principles of phonemicization might result in a much tidier analysis for Canonge. If one takes seriously the notion that meaning is irrelevant to the discovery of the phonemic level, except to the extent that the linguist is allowed to know whether two forms are the same or different in meaning, then there is no knowable semantic relationship between a verb stem with a final voiced vowel and a form identical to it except with the corresponding voiceless vowel. In such a case the two forms would differ in exactly the same way as English cat and cats, namely as different forms having different meanings. Thus the voiceless vowels could be extracted directly as phonemically distinct from the voiced vowels.

Of course the analysis of English as having a phoneme /c/ cannot be maintained once we recognize the status of [s] in relation to the morphological system. At that point the distribution of the phone [c] ceases to motivate a phoneme /c/. Similarly, suppose that discovery of the systematic semantic relationship between the verb stems in Comanche is sufficient cause for setting up a morpheme mnemonically tagged X, whose (morpho)phonemic makeup is zero. Now the voicelessness of vowels preceding X can be accounted for phonetically by hypothesizing a simple partial assimilation: voicelessness is conditioned by the phonetic 'emptiness' of X. In this much, then, there is no motivation for thinking that Comanche has voiceless vowel phonemes.

Returning now to the question of prior justification for believing that voiceless vowel phonemes do exist, we turn to section 2 of Canonge's article. Here he provides a few more minimal pairs and a fair number of near minimal pairs, illustrating the voiced versus voiceless contrast for all six vocalic timbres: i~I, e~E, u~U, o~O, y~Y, a~A, and a~Y.[4] The first forms that he gives are the following:

5) u úhtuki u? 'he came to give to her'
u útUki u? 'he gave to her and came on,' 'he came giving to her'
nóhkoki u? 'she came to bake biscuits'
nókOki u? 'she baked biscuits and came on,' 'she came baking biscuits'
u mánahkeki u? 'he came to measure it'
u mánakEki u? 'he measured it and came on,' 'he came measuring it'

For these data Canonge rules out various possibilities of predicting the voiceless vowels or their timbre based on nearby voiced vowels. Then he notes that presence or absence of /h/ is ruled out as a conditioning factor since /h/ does occur (though rarely) in a syllable contiguous to a voiceless vowel, as in 6):

6) ny úhtU 'Give it to me!' íca? ny wáhcY 'This is my rib.'

He also points out that there is frequent morphophonemic alternation between a preconsonantal /h/ and a postconsonantal voiceless vowel preceding certain suffixes. Compare the verb stem in the following two examples:

7) póhpi-tu?I 'will jump (sg.)' pópI-ci 'having jumped (sg.)'

While Canonge says nothing more about examples such as 7), it was doubtlessly known to him that it is the absence of /h/ and not its presence that is predictable here. But his exact analysis is not clear. Does he believe that the suffix /-ci/ is directly responsible for the absence of /h/? Or is it the voiceless vowel in combination with the suffix? He gives no hint that he may entertain the possibility that there are, in a sense, two different kinds of voiceless vowels, one that triggers the absence of /h/, as in 7), and one that does not, as in 6).

Nor does he suggest that the voiceless vowels in 6) and some of his other examples are predictable in a purely phonetic conditioning environment, namely before pause. For such examples there is no basis for claiming that the voiceless vowels are phonemic except to the extent that one has independent evidence of their phonemic status elsewhere and believes 'once a phoneme always a phoneme.' It is difficult to believe that Canonge, who had been studying voiceless vowels intermittently for nearly ten years at this point (fn. 1, p63),[5] failed to see that the voiceless quality of the vowels in 6) is predictable. Although he does not say so, then, it must be his faith in the phonemic status of voiceless vowels elsewhere that forces him to believe that they are phonemic here.

Canonge concludes this section of his paper by giving further 'supplemental' data illustrating voiced versus voiceless vowels in

analogous nonconditioning environments. The forms given here were discovered before the minimal pairs cited above, and Canonge is convinced that they are sufficient evidence for postulating voiceless vowel phonemes. Some of the data included here are the following (note the contrast between the left and right members of each pair):

8)	pápinyy 'heads'	nákInyy 'ears'
	týpinyy 'stones'	týboowapInyy 'teachers'
	nórybaki 'pack up'	nórYnaki 'come to make a bed'
	nýpyka 'bury someone'	wýpYka 'cut open'

Responding in part to an earlier claim by Jakobson, Fant, and Halle (1952:26) that the voicelessness of vowels may function merely as a 'border mark', Canonge is careful to cite counterevidence here. In particular, while the first four entries in 8) do have a morpheme boundary preceding -nyy 'plural', it is clear that such a boundary does not affect the voicing of a preceding vowel. Similarly, presence or absence of morpheme boundaries is irrelevant for the final four entries (for example, ny+pyka versus wy+pYka).

Taken at face value, the data in 8) point strongly toward the necessity of accepting voiceless vowel phonemes for Comanche. It remains to be seen whether such data should be taken at face value, or whether a fuller analysis will reveal that the voiceless quality of those vowels is in fact noncontrastive.

Fifteen years after the publication of Canonge's article, Miller argued that voiceless vowels in Comanche are predictable (Miller 1973). His paper deals principally with consonantal correspondences between Comanche and Shoshoni, most of which need not be gone into in any detail here. The thrust of his paper is that the differences in the consonant system are only superficial and that Comanche retains, for the most part, underlying forms in common with Shoshoni (see also Miller 1974). Most of the differences can be accounted for by positing for Comanche rules that (i) spirantize the anterior stops /p,t/ only, rather than the full stop series (including /c/); (ii) delete preconsonantal nasals; and (iii) change geminate stops (including /cc/) into 'preaspirated' stops, i.e. simple stops preceded by [h].

Miller distinguishes two types of voiceless vowels in Shoshoni. Inorganic voiceless vowels come about through the optional devoicing of prepausal unstressed short single vowels, as in 9):

9)	/puŋgu/ 'horse'	surfaces as:	púŋgu ~ púŋkU
	/kahni/ 'house'		káhni ~ káhNI
	/mi?a/ 'go'		mí?a ~ mí?A

Organic voiceless vowels result from obligatory devoicing of short single unstressed vowels followed by /h/, as in 10):

10) /haincyh/ 'friend' surfaces as: háiñčY
/haincyh+pa?i/ 'have a friend' háiñčYfa?i
/haincyh+nyy/ 'friends' háiñčYhnyy
/haincyh+a/ 'friend (obj.)' háiñčYha

Notice that the morpheme-final /h/ that devoices the preceding vowel surfaces only before [n] and [a], though it does modify a following obstruent as in 'have a friend'. Also note that the devoicing in both 9) and 10) cannot take place if the vowel in question is stressed or if it is part of a cluster (of either identical or different vowels).

This same inorganic versus organic distinction applies as well to Comanche. Although Miller does not cite any data for the inorganic variety, he certainly has in mind forms comparable in relevant respects to the data of 9) and also data such as those given in 6). There are, I believe, two further reasons for believing that one must distinguish two types of voiceless vowels. First, Miller mentions the predictable absence of [h] from forms such as those on the right in 11) (recall also Canonge's observation concerning 7) above):

11) cáhtywa?i 'open (sg.)' cátUwa 'open (pl.)'
táhporoa 'shatter' tápYhe 'remove (sg.)'
týhka 'eat' týkYci 'having eaten'

In the two forms of 'open' we have an instrumental prefix ca(h)- 'by hand' and in the next forms another prefix ta(h)- 'by foot'. In each case the [h] fails to appear if the following syllable has a voiceless vowel. The remaining forms behave similarly. In contrast with these data are those from 6) above and 12), where [h] cannot be deleted:

12) háhpi ~ háhpI 'lie (dur.)' *hápI
káhty ~ káhtY 'sit (dur.)' *kátY

Preconsonantal h-deletion is clearly sensitive (though perhaps not directly) to two different types of voiceless vowels, one obligatory and occurring in any position, the other optional and necessarily prepausal.

The second additional reason for believing that there are two types of voiceless vowels is the following. What may be called compensatory lengthening applies optionally to short single vowels followed by a syllable having an inorganic voiceless vowel, as in 13):

13) mí?aJU ~ mí?aaJU 'go (dur.)'
óMO ~ óoMO 'leg'
nýkYvynitY ~ nýkYvyniitY 'be dancing much'

But this lengthening never applies in the context of other voiceless vowels, for example those in 11) or those in forms like sápY 'belly', pícipY 'milk', etc., where there are no alternates with voiced vowels.

Miller bases his analysis of organic voiceless vowels in Comanche on three pieces of evidence. First, the possessive suffix found on many nouns can be analyzed as having a single surface shape rather than two allomorphs. Relevant data are given in 14):

14)	sápY 'belly'	sápYha 'belly's'
	pícipY 'milk'	pícipYha 'milk's'
	compare:	
	áhpy? 'father'	áhpy?a 'father's'

Miller's argument is that if /h/ belongs to the stem, the suffix is regular (i.e. /-a/). In addition, /h/ can serve as the environment conditioning voicelessness in the preceding vowel. But notice that there are at least two possible analyses. With a regular suffix /-a/, the stem may be either /sapY/ or /sapyh/. For the former, voiceless vowels are phonemic and a phonological rule inserts [h] before a following vowel. For the latter, vowels are predictably devoiced by a following /h/, which then is deleted in word-final position (and in a number of other contexts, including before /n/--compare 10), where Shoshoni retains /h/ in this position).

Miller's second line of evidence in favor of underlying /h/ that triggers organic devoicing is that the /h/ modifies following stops in a special way, as shown in 15):

15)	ýpa?a 'on you'	sápYva?a ~ sápYfa?a 'on the belly'
	ýtuhka 'under you'	sápYruhka ~ sápYRuhka 'under the belly'

That is, in just the places where we posit an underlying /h/, a following /p/ or /t/ surfaces as either a voiced or a voiceless spirant. Miller would attribute the voicelessness of the spirant to the voicelessness of /h/, but one could just as well argue that it is due to the voicelessness of the preceding vowel. So these so-called 'aspirating' stems do not really provide strong evidence of morpheme-final /h/.

Miller's third evidence in support of an underlying /h/ involves alternations such as those given in 16):

16)	mi?Aci 'having gone'	makahci 'having fed'
	tykYci 'having eaten'	wek^{w}ihci 'having entered (pl.)'
	nukIci 'having run'	pecyhci 'having invited'

He argues that devoicing of the stem-final vowels in the first column is explained if the suffix has an /h/, which is subsequently deleted.[6] The derivations would be as in 17):

17) /mi?a+hci/ ⟶ (other rules) ⟶ mí?A+hci ⟶ mi?A+ci

Clearly, however, this analysis of devoicing in 16)--which would also

apply to certain of the forms cited by Canonge--is only as strong as the independent motivation for rules of organic devoicing and deletion of /h/. A derivation such as 17) depends on, rather than supports, such an analysis. If voiceless vowels are phonemic, those in the left column of 16) are morphophonemically conditioned. That is, /mi?A-/ is the shape of the stem when the suffix is /-ci/, or /-ci/ selects /mi?A-/, and similarly for various other stems and suffixes. The inescapable fact, not sufficiently stressed by Miller, is that verbs are almost totally arbitrarily classified as to which of the variants of the -(h)ci suffix (and certain others) they appear with.[7]

Overall, Miller's analysis of organic devoicing has the advantage of predicting the occurrence of what would be rather unnatural underlying segments. Further, it accounts for the absence of surface [h] in certain environments in a straightforward way. And finally, it allows the collapsing of the data of 14) with those of 18), the latter not cited by Miller:

18)	ýny 'you'	ýnYha 'you?'
	cáka 'lead (an animal)'	cákYhujyka 'round up (animals)'
	íka 'enter (sg.)'	íkYhutu?I 'will enter (sg.)'
	k^{w}ýhy 'wife'	nának^{w}Yhy 'married couple'
	ýhy 'blanket'	wána?Yhy 'cloth blanket'
	kóhno 'cradle'	hávikOno 'night cradle'
	wýhora 'dig'	kú?wYhora? 'hoe mattock'

These data illustrate a variety of contexts in which /h/ devoices a preceding unstressed single vowel, including lexical compounds, prefixation and suffixation, and encliticization. There can be little doubt that Comanche has such a rule.

Before turning to a major problem in Miller's analysis of organic devoicing as I have so far presented it, I wish to point out further predictable instances of voiceless vowels mentioned by neither Miller nor Canonge. Since separating from Shoshoni, Comanche has apparently generalized the rule producing organic voiceless vowels. Consider the following:

19)	ómoma 'by foot'	ómomYsy 'still by foot'
	másyapY 'grown'	týmYsyapY 'crop'
	kása 'wing'	kákAsa 'wing (redup.)'
	tósa 'white'	tótOsa 'white (redup.)'
	pýmy 'themselves'	pýmYsu?a 'themselves also'
	sýmynoo 'completely haul'	sýmYsihwa 'completely tear'
	éka 'red'	ékAsahpana? 'soldier'

These forms show short single unstressed vowels devoicing before /s/ in various environments, whether phonological or otherwise, comparable to those given for devoicing before /h/ in 18).

In fact, this devoicing obeys an additional interesting constraint unmentioned by Miller. The rule of organic devoicing must be restricted so that it does not apply if a voiceless vowel occurs in the syllable to the left, as in 20):

20) káhnikY 'at the house' sápYka 'at the belly'

The postposition /-kah/ 'at' here has two surface shapes dependent on the preceding context. After a stem-final voiced vowel, the vowel of the postposition is voiceless; after a stem-final voiceless vowel, the vowel of the postposition is voiced. The /h/ of course is deleted in both instances. Many additional examples could be given to show that the constraint operating here is perfectly regular. It operates in exactly the same way when /s/ is the trigger for devoicing, as in 21):

21) sítykYse? 'this one' sítyk^{w}Ykyse? 'these two'
kárykukYse? 'sitting' cúhnipYkyse? 'bone'

Untranslated in these examples are two narrative particles: /-ky/ marks remote past or speaker noninvolvement and /-se?/ marks paragraph breaks or major points of contrast.[8] Notice that when the stem ends in a voiced vowel the vowel of /-ky/ devoices before /s/, but when the stem ends in a voiceless vowel the vowel of /-ky/ remains voiced.

Inorganic devoicing, on the other hand, is unaffected by a voiceless vowel in the preceding syllable, whether that vowel is devoiced by /h/ or by /s/:

22) sápYka ~ sápYkA 'at the belly'
ómomYsy ~ ómomYsY 'still by foot'

This lack of sensitivity to prior context on the part of inorganic devoicing constitutes an additional reason for sharply distinguishing between organic and inorganic voiceless vowels.[9]

Turning now to the major problem in this analysis of organic devoicing, Miller notes that not every [h] triggers devoicing, even though all conditions on application of the rule appear to be met. The following data illustrate this point:

23) mánahkeki 'come to measure'
ýtuhka 'under you'
mákahci 'having fed'
nánahtena 'menfolk'
túnehcy 'run'
wá?ihpy? 'woman'
týcihka?a 'cut off (sg.)'

Miller accounts for this sort of data by claiming that there is no /h/ present at the point when organic devoicing applies. He believes that the surface [h] comes about through a later rule that preaspirates underlying geminates. A form such as mánahkeki 'come to measure' would be /manakkeki/ at the stage of the derivation where the organic devoicing rule applies, and thus not susceptible to devoicing (i.e. counter-feeding order of application).

Surprisingly, Miller provides virtually no reason for accepting this preaspiration analysis, aside from the fact that it handily accounts for lack of organic devoicing where necessary (this is not to deny the historical accuracy of such an analysis). Is there any independent reason for believing that the analysis is correct?

Notice first that there are surface contrasts between the simple medial voiceless stops and affricate, and those segments preceded by [h]. In 24) I illustrate this contrast at the velar point of articulation:

24)	máka 'feed'	máhka 'this (obj.)'
	píka- 'leather'	píhka 'scar'
	-taka 'just, only'	táhka- 'ice, snow'

A very few verbs show medial consonant contrasts as in 25), which repeats part of 12):

25)	hávi 'lie (sg.)'	háhpi 'lie (dur.)'
	káry 'sit (sg.)'	káhty 'sit (dur.)'
	jýkʷi 'say (sg.)'	jýhkʷi 'say (dur.)'

In a grammar lacking the proposed rule of geminate preaspiration, these special durative forms could easily be handled by a lexical rule that inserts /h/ into the stems /hapi/, /katy/, etc. A rule of spirantization accounts for the pronunciation of the nondurative forms of 'lie' and 'sit'.

There are also numerous morphophonemic and phonological alternations involving these consonants. Some of these alternations result when a limited set of suffixes occur with verb stems, giving phonetically either a voiceless vowel or a voiced vowel followed by [h]. 16), which I repeat here as 26), illustrates this:

26)	mí?Aci 'having gone'	mákahci 'having fed'
	týkYci 'having eaten'	wékʷihci 'having entered (pl.)'
	núkIci 'having run (sg.)'	pécyhci 'having invited'

As noted above, it is almost totally unpredictable whether a particular verb stem shows a voiceless vowel before this type of suffix, or a voiced vowel followed by [h].

The final alternations have also been noted above, namely those illustrated in 7) and 11), repeated here as 27):

27) cáhtywa?i 'open (sg.)' cátUwa 'open (pl.)'
táhporoa 'shatter' tápYhe 'remove (sg.)'
póhpi 'jump (sg.)' pópIci 'having jumped (sg.)'
týhka 'eat' týkYci 'having eaten'

The alternations here can be accounted for by a deletion rule sensitive to the presence of an organic voiceless vowel in the following syllable (recall from above than an inorganic voiceless vowel does not trigger this deletion).

Clearly, there is nothing in any of the above data that independently motivates a synchronic rule preaspirating underlying geminates. Do such geminates in fact exist synchronically? The only possible reason that I can find for thinking so is an argument based on symmetry, but this argument is extremely weak. Briefly, it is this:

28) i. Phonetically, there are no consonant clusters of any kind other than [hC] and [?C], and the only word-final consonants are [h] and [?].
ii. In order to block certain applications of a rule that spirantizes intervocalic /p,t/, it may be necessary to hypothesize underlying nasal+stop clusters both across morpheme boundaries and intramorphemically. The nasal is subsequently deleted.
iii. If we allow underlying nasal+stop clusters, we may also want to allow stop+stop clusters, including /cc/, in the same positions. The only restriction, presumably, is that the stops must be identical, i.e. geminates.

The reader will correctly assess the fragility of the above argument when it is realized that the only evidence in the entire language for nasal+stop clusters rests on the desirability of analyzing a single possessive (or objective) suffix as /-a/ rather than as /-a/~/-na/. That is, nasals would be deleted absolutely in clusters and would surface across morpheme boundaries only before the suffix /-a/.

Summing up the above discussion, I have shown that one cannot realistically account for lack of organic devoicing by claiming that only /h/ and /s/ trigger this rule and that all 'faulty' instances of [h] are due to a later rule preaspirating underlying geminates. In addition to the problem of weakness discussed above, such an analysis would suffer from the problem of opacity. Note the forms in 29):

29) pýhca 'burst' cápYca 'rip open'
wíhte 'peep' tókʷIte 'peep'[10]

According to the geminate preaspiration analysis, the forms on the left in 29) are from underlying /pycca/ and /witte/, respectively. The vowels in the first syllables should therefore not be susceptible to organic devoicing. The forms on the right contradict this analysis, and suggest instead that the underlying stems should be /pyhca/ and /wihte/. Therefore, there must be two possible sources for surface hC clusters, both /hC/ where the /h/ is not deleted, and underlying geminates.

If organic devoicing cannot be blocked by claiming that certain instances of [h] are not present at the relevant stage in the derivation, some other mechanism must be found to accomplish this. There are really two issues here. One is, as Miller clearly pointed out, the fact that not all surface [h] induce devoicing of a preceding short single unstressed vowel. The other is that not all voiceless vowels that we want to call organic (rather than inorganic) are followed phonetically by [h] or [s]. While there is abundant evidence that Comanche has a synchronic rule devoicing vowels followed by /h/ or /s/, it is not at all clear that all voiceless vowels, other than inorganic ones, are the result of this rule.

There are three situations where organic voiceless vowels from /h/ are unsupported by phonological alternations. Certain stems, which undoubtedly at an earlier time exhibited alternations, now have non-alternating voiceless vowels in all known forms. Canonge's -pYka, cited in 8), is an example and many others could be given.

There is also a lack of alternation evidence for the voiceless vowels in certain verb stems when the stems appear in conjunction with a small class of suffixes, referred to above in 7) and 16) (= 26)). With these suffixes, the final vowel in some stems is devoiced, while in others it remains voiced but is immediately followed by h . This surface [h], as well as others, obscures the analysis of voiceless vowels as predictable before /h/.

Finally, there are three suffixes for which there is a difference in meaning correlated with a difference in verb stem form, as illustrated in 2) and 5) above from Canonge. For these suffixes, the verb stem in citation form (*final voiced vowel not followed by* [h]) *is semantically* distinct from the stem with either a voiceless vowel or a voiced vowel followed by [h], the choice between the latter two being unpredictable.[11]

At this point, unfortunately, I have no analysis that works any better than Miller's, or indeed any better in certain respects than Canonge's, though I have shown that Canonge's can be improved upon considerably in other respects. I am unable to account for certain voiceless vowels other than by stipulating them (in one way or another). If this is approximately what we mean by claiming that certain voiceless vowels are phonemic, so be it. We do not buy any understanding of the language by building an abstract /h/ into the underlying representation

of these forms merely as a device for encoding the fact that they exhibit voiceless vowels phonetically. Clearly, if we consider the diachronic piture we must entertain the possibility that Comanche has phonemicized voiceless vowels in certain forms, while at the same time it has greatly extended the predictable occurrence of voiceless vowels by simplifying the triggering environment to include /s/ as well as /h/. It is my hope that research on voiceless vowels in various kinds of compounds will eventually shed some light on this possible phonemicization.

NOTES

1 Some of the material covered here was presented before the 1984 Mid-America Linguistics Conference (Armagost forthcoming).

2 In these and subsequent data , I use h as a cover symbol for various nonsyllabic allophones, as in 1). The voiceless syllabic segments E, Y, etc. are the focus of attention here.

3. In this and following examples, Canonge originally provided only the sequential reading. A footnote in his later volume of Comanche texts refers to the 1957 article and supplies the simultaneous reading (Canonge 1958:4).

4 As Canonge notes (p65), the alternation a~A is much rarer than a~Y. It is now known that inorganic devoicing of /a/ yields A, while organic devoicing of /a/ yields A following a glottal stop and Y elsewhere. (I am at present unable to account for certain exceptions to this statement when organic devoicing is triggered by /s/, as discussed below.) For 'organic' and 'inorganic' see discussion of Miller's work below. The predictable distribution of A and Y was pointed out to me by John McLaughlin (personal communication).

5 I recognize the danger in trying to second guess another's beliefs, even one who claims to have a decade of experience. However, as anyone who has even superficially examined Comanche texts will agree, the voicelessness of the vowels in 6) is a very easily seen regularity. Canonge's handling of the voiceless vowels here is, to my mind, one of the most disturbing facts about his otherwise quite good understanding of the language.

6 Apparent exceptions are discussed below.

7 Since vowels in clusters (long vowels or diphthongs) cannot be devoiced, stems like /saa-/ 'boil' and /caai-/ 'hold' predictably show

an [h] in the suffixed forms under discussion (saahci, caaihci, etc.).

8 See Armagost 1983:13-14. McLaughlin 1983 takes a slightly different view.

9 As far as I know, compensatory lengthening, as in 13), cannot apply to penultimate voiceless vowels, as in 22).

10 Given as such by Canonge 1958. There is some evidence for a rule /w/→[k^w], particularly following a stressed vowel. wásy 'kill (pl.)' and týk^wYsy 'butcher (pl.)' show the same alternation.

11 The stems referred to in fn. 7 of course take only the variant with [h].

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