LITERACY AND LINGUISTICS:

THE HAVASUPAI WRITING SYSTEM

Rena Crock, Leanne Hinton and Nancy Stenson

Introduction. Linguists have lately been involved to a great extent in the development of practical writing systems for hitherto unwritten languages. As a group, we come well prepared for the task from the point of view of our knowledge of phonetic alphabets and non-western languages, but at the same time, we have failings that are also a result of our discipline. We come to the matter of writing systems with a set of biases that have developed as a part of our background. We combine these biases with large pockets of ignorance about the nature of written language in general: research on the sociological, psychological, pragmatic or formal aspects of existing written languages is scanty; most of us have concentrated only on the nature of spoken language in our previous education and research.

Thus those of us who have been involved in the development of practical writing systems for communities who actively utilize an unwritten native language have found that the process of development is full of surprises, some frustrating and some delightful; and that it is in fact a tremendously rich learning experience for the linguist.

Our most important realization must be that our linguistic expertise does not in fact prepare us to develop an ideal writing system for a community. An honest acceptance of this fact necessarily leads us to the acceptance of the even more important fact that members of the community we are working for frequently have a better idea than the linguist of what kind of writing system would be best for the community. The ideal application of these facts is the full-scale teamwork between the linguist and community members during the time the writing system is being developed. This paper is a study of the history of the Havasupai writing system, how teamwork was developed and utilized, and what the characteristics of the ensuing writing system are. It will also show what some of the theoretical and sociolinguistic lessons are that the linguists themselves learned during the development of the system. It will be seen in this paper that

(a) The development of writing systems is necessarily affected by social values to at least as great an extent as values of pragmatics or linguistic economy.

(b) The development of the Havasupai writing system brings to light facts that indicated that the descriptive model of languages adhered to by linguists tends to be conservative: what we set up as "deep structure" in many cases turns out to be an earlier structure, rather than the representation of synchronic psychological reality. While conservative models are useful to linguists, especially in comparative work, these models are not useful to modern native speakers wishing to get on with the business of reading and writing.

(c) While linguists and native speakers alike use as an argument
for the development and dissemination of writing systems the idea that language and cultural traditions can be preserved through it, it may in fact be the case that the demise of active tradition may be hastened by the successful dissemination of a writing system.

The Development of the Havasupai Writing System

The Havasupai Bilingual Education Program was designed to accomplish simultaneously two related goals: to introduce the Havasupai language and culture into a previously all-English school system, and to develop a written language for the benefit of the adult community. The long-term result hoped for from accomplishment of these objectives is the preservation of the language by reestablishing its footing as the primary medium of communication in all aspects of community life.

The Havasupai community consists of approximately 500 tribal members, including about 60-70 children attending school in Supai village, and ranging in age level from preschool to 6th grade. Older children must leave the canyon to attend various boarding schools. Because of its isolation, Havasupai has survived better than most related languages. Havasupai is the first language of virtually all members of the community with the exception of a very few non-Indians or members of other tribes. Though most adults speak English by virtue of having been educated in English-speaking Indian Schools, Havasupai is the language of preference in the home, and children entering school have in fact very little competence in English. Though bilingual aides have been employed in the schools for some years, basic curriculum has always been overwhelmingly English dominated.

A child being taught to read, do arithmetic, and accomplish other basic skills in a language he does not understand will clearly not learn these skills properly, and his subsequent education will be retarded as a result. There is therefore a very pressing need to introduce Havasupai as the medium of instruction in the classroom, especially at the early levels. The philosophy of the program is that the children have a right to learn reading and other skills in their own language while the English language is being taught as a separate subject. To accomplish this goal, materials for teaching reading and other skills through the medium of Havasupai must be made available.

As for the adults, they continue to use Havasupai in their daily life (though the use of English words is becoming more prevalent, both for items not indigenous to the culture and for certain classes of words such as numbers and colors, where existing Havasupai lexical items are being replaced by English ones among younger speakers). The lack of a written language, however, has produced a somewhat schizophrenic linguistic situation for the Havasupai. Though in all his daily oral transactions he may use Havasupai, he must use English for any written transactions. Development of literacy in Havasupai as well as English is expected to redress the balance and return unity to the linguistic situation within the community.

The prerequisite for the accomplishment of both these objectives is of course a written language. Thus in 1974 the Havasupai Tribe applied
for a grant to develop a bilingual education program, where the first priority was to develop a practical orthography which could be used to produce classroom materials, especially for the teaching of reading to schoolchildren, and at the same time be introduced into the adult community.

The Havasupal members of the Havasupal Bilingual Education Program (HBLEP) presently include Rena Crook, the on-site director; Edith Putescy, the head language advisor; and Webb Jones, language advisor. Leanne Hinton is the linguistic director of the program, being on-site during summers and making monthly trips during the school year; and Nancy Stenson served for the first three months of the program as the on-site linguist, to oversee the training of the Havasupal team members.

As linguists, Hinton and Stenson were guided in their initial choice of symbols by the following criteria:
(a) The alphabet should be unambiguous—it should follow the rule of "one sound, one symbol" that forms the basis of phonetic alphabets;
(b) It should adhere as closely as possible to alphabets developed for other Yuman languages, for the sake of easy transfer and a kind of aesthetic unity.

Both of these considerations meant that the basis of the practical orthography would be the phonetic inventory postulated for Havasupal by Koslowski (1972):

| TABLE 1 |
|---|---|
| vowels: | i | a | u |
|        | e | o | +length |
| consonants: | p | t | k | kw | q | qw |
|           | v | es | c | h | hw |
|           | m | n | ny |
|           | l |
|           | r |
|           | w | y |

However, the authors were also guided by pragmatic considerations, especially the following:
(c) Since the adult population is literate in English, and children will all become so, the alphabets should be as similar as possible to allow easy learning of both;
(d) It also seemed desirable to produce an alphabet which could be easily reproduced on a standard typewriter.

Criteria (c) and (d) meant that diacritics and other special symbols should be kept to a minimum, and that digraphs of the sort used in
English might be utilized in Havasupai as well where ambiguity was not a problem.

The operation of all four criteria resulted in an initial system as follows:

**TABLE II**

<table>
<thead>
<tr>
<th>Vowels:</th>
<th>a</th>
<th>e</th>
<th>i</th>
<th>o</th>
<th>u</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>aa</td>
<td>ee</td>
<td>ii</td>
<td>oo</td>
<td>uu</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consonants:</th>
<th>p</th>
<th>t</th>
<th>k</th>
<th>kw</th>
<th>q</th>
<th>qw</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>v</td>
<td>th</td>
<td>s</td>
<td>ch</td>
<td>h</td>
<td>hw</td>
</tr>
<tr>
<td></td>
<td>m</td>
<td>n</td>
<td>ny</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>r</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>w</td>
<td>y</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

This alphabet was seen by all as a starting point only. It was the goal of the linguists to teach this preliminary system to the Havasupai team members, and then for the team as a whole to spend several months practicing with it, finding the problem areas, and coming up with solutions that would slowly solidify into a finalized system. As a further effort to make certain that the final result was reached by a consensus of native speakers, an adult education class was soon instituted, taught by Rena Crook. This class also worked on the problem areas, and were influential on the final outcome.

Even after the on-site linguist’s work was finished, the Havasupai team members continued to make revisions in the alphabet and in the spelling conventions for close to a year. Before discussing the process in detail, we will present the final alphabet here. It will be noted that there are great differences between it and the initial system.

**TABLE III**

<table>
<thead>
<tr>
<th>Vowels:</th>
<th>a</th>
<th>e</th>
<th>i</th>
<th>o</th>
<th>u</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>aa</td>
<td>ee</td>
<td>ii</td>
<td>oo</td>
<td>uu</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consonants:</th>
<th>b</th>
<th>d</th>
<th>g</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>p</td>
<td>t</td>
<td>k</td>
</tr>
<tr>
<td></td>
<td>f</td>
<td>th</td>
<td>s</td>
</tr>
<tr>
<td></td>
<td>v</td>
<td>j</td>
<td></td>
</tr>
<tr>
<td></td>
<td>m</td>
<td>n</td>
<td>ñ</td>
</tr>
<tr>
<td></td>
<td>l</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>w</td>
<td>y</td>
<td></td>
</tr>
</tbody>
</table>
In fact, this alphabet, with the r gone, and with seven new characters added, represents a system closer to the modern phonemic system of the Havasupai language. The original alphabet turns out to represent a conservative system, set up on the basis of phonological and morphophonological rules that appear in retrospect to be more historical than synchronic.

Other criteria for alphabetic development. Not unnaturally, the linguistic criteria (a and b above) for determining the ideal alphabet were not greatly valued by the Havasupai members of the team. The pragmatic criteria invoked by the linguists did represent values shared by the Havasupais; but beyond those, various other criteria were soon to be of importance.

(e) Given that Havasupai sounds that are similar to English sounds should have the same representation in both languages when possible, it was also brought out by the Havasupais that sounds contrasting phonetically with English sounds should have different representations, even if it means the creation of unusual symbols. (See discussion of t an example.)

(f) Social and political criteria turned out to be very powerful in the final determination of the character of the writing system. Having a writing system similar to writing systems of other Yuman languages was given a negative value by the Havasupais. The Havasupais see a writing system not only as a reflection of linguistic differences, but also as a tool to engineer greater similarity or greater contrast between two dialects or languages. They adhere strongly to the notion that language differentiation is a key phenomenon in the maintenance of group boundaries. They wish to maintain strong distinctions between themselves and other tribes, and wish their writing systems to reflect it. Thus if a choice between two symbols of equal pragmatic value were to arise, the Havasupais would choose that symbol which is not espoused in the writing system of a related language. (The discussion of b, d and g is related to this matter.) Furthermore, attempts by Hinton and Stenson to help bring the Hualapai alphabet closer to the Havasupai system were censured by the tribal council, on the basis that the alphabets should be kept distinctive to encourage distinctiveness in the dialects.

The problems relating to the differences between the original writing system and the finalized version will be discussed in the following sections, as will some of the other problems the staff encountered in devising and implementing the spelling system.

Consonant voicing. Table I indicates that Havasupai has the usual Yuman voiceless unaspirated obstruent series, but the alphabet shows an array of both voiced and voiceless stops, as well as voiced/voiceless distinction in a fricative (v, f) and an affricate (j, ch). The dentals, which presented special problems and have a different explanation, are discussed in the next section. For the other obstruants, the alphabet differs from the original phonemic inventory as follows:
TABLE IV

<table>
<thead>
<tr>
<th>phoneme</th>
<th>letter</th>
</tr>
</thead>
<tbody>
<tr>
<td>p</td>
<td>p, b</td>
</tr>
<tr>
<td>k</td>
<td>k, g</td>
</tr>
<tr>
<td>kw</td>
<td>kw, gw</td>
</tr>
<tr>
<td>ċ</td>
<td>ch, j</td>
</tr>
<tr>
<td>v</td>
<td>f, v</td>
</tr>
</tbody>
</table>

The letters b, g and j are now used to represent the lenis, voiceless non-continuants that were represented as p, k and ċ in the original system. In Havasupai, these stops vary between voiceless and voiced. (Koslowski, personal communication, has noted that this is a stylistic variation, governed by social context: the strongest voicing is found in men rather than women, and mostly in men who are interacting in a tough, male-oriented situation, such as during a rodeo or a drinking session.

Linguists define voicing as the primary difference between the two English stop series, although other differences are also present: the English voiceless stops and affricates could also be defined as fortis, while the voiced stops are lenis (Foley, 1972). It appears that to someone who has not been taught the linguistic point of view the fortis-lenis distinction might hold precedence over the voiceless-voiced distinction. At any rate, the Havasupals, bilingual in Havasupai and English, hold that their non-continuant series is most like the b, g, j of English.

To recapitulate, the Havasupals are bilinguals, faced with a series of stops in Havasupai that are most systematically characterized as [+lenis, -voice], and two series in English that are [+lenis, +voice] and [-lenis, -voice]. They had the choice of deciding whether the distinctive difference between the two English series is voicing or lenition; and they decided in favor of lenition.

If we as linguists wish to match our analyses to a model of psychological reality, factors such as these might force us to rethink our choice of distinctive features in characterizing stops.

The voicing or lenition of stops and affricates is an important difference between Havasupai and the neighboring Pai dialects (Hualapai and Yavapai), and so the sociopolitical considerations cited in (f) were another motivating factor in the choice of b, g, j over p, k, ċ.

However, in certain words, stops were consistently voiceless, fortis and aspirated, and were perceived as contrasting with those written as voiced stops. There are even some minimal and near-minimal pairs for the two series:

\[
\begin{align*}
[g\text{wa}] & \sim [k\text{wa}] \text{ horn} \\
[k\text{pha}] & \text{ metal}
\end{align*}
\]
[bu] - [pu]  gun
[pʰu]  bow
[baː] - [paː]  man
[pʰa]  bullet

Other examples of aspirated noncontinuants:
[čʰəda]  "winter"
[kʰəya]  "different"
[ʔəʃʰəʔu]  "coyote willow"

A look at earlier forms (Spier, 1924; Whiting, n.d.) shows the historical origin of the aspirated stops to be an hC cluster, which is reduced in most speech to a heavily aspirated single consonant. The cluster can still be heard in the very careful speech of older speakers.

Examples:
[pʰu] - [hpu]  bow
[čʰyda] - [hčuda]  winter
[kʰəya] - [hkaya]  different

It was the Havasupais, not the linguists, who first pointed out the aspirated series and decided to represent it with p, k, and ch.

The younger members of the team and adult education class were not aware of the origin of the aspirated stops, and were not even aware of the older people's alternant pronunciation until the older people and linguists pointed it out. These facts can be seen as good evidence that young Havasupais perceive the aspirated forms as separate phonemes rather than as surface results of phonological rules operating on an hC deep structure.

The fact that the linguists were not the ones to first notice the aspirated series is indicative of the bias toward linguistic conservatism that is built into linguistic analytical theory and method. To begin with, Americanists have tended to work primarily with older native consultants; secondly, linguists seek regularity and simplicity of underlying forms with passion. In the search for regularity, we often lose sight of the distinction between historical and synchronic rules, and end up creating a model that might be more indicative of an earlier model of a language rather than the model operating in a present day language.

Nevertheless, the rules that have been postulated for Havasupai do seem to fit to some extent the model utilized by the oldest members of the tribe, as evidenced by alternant forms. The differences between the language of the older and younger speakers are worthy of a separate study; but one very central difference might be pointed out here: Havasupai language change, as evidenced by the differences between the older and younger speakers, seems to involve a simplification of the system of phonological rules (that is, the actual loss of many phonological rules) and a concomitant complexification of underlying form (such
as the addition of new phonemes). Notable is the loss of variability in the speech of younger Havasupais, an aspect of linguistic change that has been discussed widely in sociolinguistic literature in varying contexts. 4

Dentals. The orthography appears to be somewhat top-heavy in the dental series: ë, ë, th, d. The symbol th needs the least comment: it represents the same voiceless interdental fricative as in English.

The symbol ë represents an interdental stop [ ë ]. At first, on the assumption that Havasupai had only the interdental stop, the linguists tentatively used the letter ë for it. From the staff, the Havasupai staff members were uneasy about this decision. In contrast to their choice of b/g to represent the unaspirated stops, they felt that the phonetic differences between Havasupai [ ë ] and English [ th ] were too great to justify using any English letter for the Havasupai sound. This uneasiness turned out to be widespread: when an adult education class in reading and writing Havasupai was begun by the bilingual education staff, members of the class unanimously and emphatically rejected the use of ë for [ ë ] on the grounds that the letter represented some other sound. This was such an emotional issue that interested members of the tribe that were not in the adult education class even brought up the matter in tribal council meetings, asking that the HBLEP team be directed not to use the letter ë for the sound. Thus the letter ë was invented to use for the interdental stop.

After the decision to use ë was made, an aspirated alveolar [ th ] was found in one word: [ thæ ], "reed". This word is pronounced [ thæ ] invariably, even by older people, and is also found as [ thæ ] in Whiting's notes (based on the language of the old people alive in the '30's). It is nevertheless a reasonable guess that it derives from an older form with an initial [ h ]. 5

The symbol d is used for the phoneme that is /r/ in other Yuman languages. The preliminary alphabet used r as the letter. But as work began working out the spelling of individual words, it became apparent that the staff's natural inclination was to write a d instead. Gradually it became apparent that the r was unnecessary. In medial position, of course, this sound matches very closely the English intervocalic flap derived from dental stops. Even initially, the Havasupai consonant sounds far closer to English /d/ than Spanish /r/ does. The oldest members of the tribe sometimes (but very rarely) pronounce a rolled or flapped [ r ], but for the speakers under 60 it seems to have become a full-flapped voiced stop. / r /, then, does not appear to be part of the modern Havasupai phonemic inventory.

Nasals. The nasal series is fairly straightforward, but a couple of comments are in order. The palatal /n/ is quite common, and for some time we vacillated between the spellings n and ny. Considerations of ease in typing would dictate the latter, but because ny is such a common English sequence, especially in final position, and has a very different phonetic realization (as in many, funny, etc.), the staff decided to recognize (as was done for ë ) that Havasupai / n/ is a sound
which does not correspond to any English phoneme, by giving it an orthographic representation that differs from English. The typographical inconvenience of adding a tilde (which is readily available on many typewriters anyway) was felt to be outweighed by the desirability of avoiding potential confusion with the English spelling sequence.

A different sort of problem arises with the velar nasal [ŋ], which is now represented by an n with a dash through it: n. This sound is not phonemic for older Havasupals, although the status of [ŋ] is questionable for the younger generation. The sound [ŋ] derives from the sequence /g+/m/ occurring in verb forms, specifically linking a second-person verb with its following auxiliary. That is, [ŋ] results from assimilation of the "same-subject market" /-g/ with the second-person prefix /m/:

\[
\text{/go+m-ya+m-g+m-yy/}
\]
\[
\text{where you-go-sst-you-be/ } \text{ "Where are you going?"
}\]
\[
\rightarrow \text{[gemyā-mīgyū]}
\]

The linguists were interested in seeing whether Havasupals would wish to write the [ŋ] in some way representing its surface phonetic form, or if they would choose to write the underlying form instead. From the first, the Havasupal team members chose to represent the surface form in the orthography. Related to this is the fact that while older speakers will keep the /g/ and /m/ separate in very slow, careful pronunciation ([gemyāme mīyū]), the younger people always use the [ŋ] pronunciation, no matter how carefully they enunciate. Furthermore, when the derivation of [ŋ] from /gm/ was pointed out to the younger speakers, they were surprised and skeptical until older speakers convinced they by slow enunciation of some examples. All these factors are indications that the rule /g+/m/ → [ŋ] is not productive among the younger Havasupals, and that they see [ŋ] as a phoneme.

The original choice for spelling [ŋ] was ng, which appealed to the linguists for several reasons: it corresponded to English spelling for words such as sing and singer; and it bore some analogy to the derivation of the form, since it still contained a g. However, it became evident that in the Havasupal spelling system as conceived, there were many instances where the spelling sequence ng would be used when the pronunciation of the sequence would be [nag]. (Examples: hanga [haniga] ngo' o [negō'].) For a while, we tried the convention of writing n-g for these latter sound sequences, but we also found that bilingual adults tended to pronounce the ng sequences as [ŋ] or [nag] when sounding out all words. After practice, the adults could certainly have learned the spelling-pronunciation correspondence, but the Havasupal staff decided it would be considerably simpler to invent a new letter instead. And so n was born.

It is interesting to speculate on what will happen to a sound such as [ŋ], that is present in the language in virtually only one place. This seems like an unstable situation: either [ŋ] should become more general or it should disappear. We vote on the latter possibility, based on the observation that some younger people, while generally using
[ŋ] in careful pronunciation, often use [n̩] in informal speaking. Since /n/ is a common phoneme in Havasupal, it is possible that eventually /g/ will disappear.

Other letters. The other letters in Havasupal are fairly straightforward: ' for [ʔ], aa for [aː], and the corresponding double letters for the other long vowels. One problem came up with the spelling of diphthongs: for the diphthong [ay] we had the choice of spelling it ai or ay. The team settled on ai to avoid confusion with the [ey] diphthong in English that is commonly spelled ay. Thus:

bāigu "white man"
bāgtal "old man"

However, when the diphthong is followed by another vowel, a [y] is definitely interpreted as being present, as in [bāyä] "al", [mēgwaːyä] "hurry up!" For some time, spellings like mēgwāyä were used, but adding the y to the i of the diphthong seemed redundant and awkward, and the practice was eventually abandoned in favor of a spelling rule changing i to y before a vowel.

Shadow vowels. The notorious question of the phonemic status of the "shadow vowels" (short unstressed reduced vowels generally represented in linguistic descriptions as schwa) in Yuman languages resurfaces as an orthographic problem as well: should shadow vowels be written? And if so, how? The five vowels are already in use and no convenient extra symbol is available. Though the phonetic reality of schwa, especially at morpheme boundaries, is undeniable, it is not really heard as a separate vowel. Its quality varies widely according to the surrounding consonants and, to a lesser extent, the speakers; and its phonetic manifestations cover most of the vowel spectrum. (See Hinton, 1977, for a thorough discussion.)

We began writing shadow vowels, trying to assign to each occurrence the quality of whichever of the other five vowels it most closely approximated. The results, however, were anything but consistent. Perceptions varied enormously—different people would hear the same word differently, and the same person might spell a word two ways on two different occasions.

Derivational morphology and grammatical inflection are also affected by the shadow-vowel problem. One would like to be able to identify affixes consistently without elaborate rules to account for the presence or absence of a vowel between various affixes. But it is not always possible to do this and continue writing the shadow vowel. The imperative prefix /m/-, for instance, was written quite regularly as m- in words like mīvaama "go!" because the stem-initial palatal conditions a high quality in the vowel. But the same prefix takes different forms before other verbs: mē'eva "Listen!", muwah "Sit!", mēmāh "Eat!" Of course, in this last example, the quality of the shadow vowel in the first syllable is quite different from that of the stressed vowel, even though they are written the same. Finally, before a few stems, only the m- is heard and written: mįj "Say!" (Most other vowel-
Initial stems take an inserted ?: [məʔəva] "Listen!"

Verbal suffixes provide another illustration. The same-subject market after a vowel-final stem is written -g: smaamyu "He is sleeping", gwaawgi "He is talking". But after a stem-final consonant, a shadow vowel appears: swaadagi, or swaadagl, etc. "He is singing". Even if an arbitrary vowel were chosen to go with the suffix, at best two "allo-
graphs" would be needed; no consistent spelling rule could be devised to predict their occurrence, because after sonorant consonants the shadow-vowel may or may not be heard, and spelling alternations such as yaaamgyu / yaaamgyu "He is going" would be inevitable.

Probably the most Important problem in writing the shadow vowel is that the stress regularity of the language is damaged by a series of unstressed vowels between suffixes. Since stress is on the final syllable of the stem, only suffixes containing a vowel will affect the pattern of final stress. If suffixes are written with shadow vowels there will be a large number—probably a majority—of words whose stress is unpredictable in the writing system. As an example, consider the following pairs, spelled first as they would be with shadow vowel in-
cluded, then without:

midig "beans" swaadig "sings"
mdig swaadg

In the first spelling, both words end in -ig. In midig, this is the stressed stem vowel, but there is no way in this spelling system to distinguish it from the unstressed -ig suffix of the verb, and the differences in stress between the two words are unpredictable. Elim-
inating the shadow vowels from the spelling of each word leaves only one choice for stress in each case—the correct one.

A further argument for the elimination of shadow vowels from the spelling system is that phonologically, shadow vowels are generally predictable by rule. (See Hinton, 1977, for a description of Havasupai vowel insertion rules.) Havasupai staff members have no problem reading back words that have been written without the shadow vowels.

So after considerable work with the problem, the Havasupai staff decided to dispense with the writing of shadow vowels. This decision can be said to have turned the writing system into a partially conson-
antal system like the writing systems for Hebrew and Aramaic. The present spelling system only writes root vowels and vocalic suffixes.

The Havasupai decision to leave out shadow vowels can be seen to have bearing on a problem that has been discussed by Yumanists for a long time: are shadow vowels underlying or inserted vowels? Shaterlon (n.d.) postulated that in Yavapai unstressed vowels should be viewed as inserted; Hinton (1977) claimed the same for most (but not all) shadow vowels in Havasupai; and the Havasupai staff went a long way toward clinching the matter by demonstrating the psychological validity of vowel-insertion rules, by their decision not to write shadow vowels.
Some cultural implications of new writing systems: A warning.

Some major differences between writing cultures and non-writing cultures are as follows:

(a) In non-writing cultures, knowledge is transmitted orally and face to face. Face-to-face oral communication has many facets lacking in written communication; besides the "paralinguistic" parameters of intonation, gesture and facial expression, face-to-face communication can take place in a context that involves objects, dancing, singing, and other non-linguistic phenomena. Further, oral face-to-face learning usually takes place in the very context where the knowledge is to be applied—at curing ceremonies, at ceremonial dances, during hunting expeditions, etc. Writing has the effect of removing communication from its normal context.

(b) In non-writing cultures, representations of history, religion, law and other institutions change relatively fluidly to fit in with a holistic cognitive schema of reality. In writing cultures, written knowledge has permanence and rigidity; it does not change fluidly.

(c) Related to the above is the implication that people in a non-writing culture, by changing knowledge to suit a holistic view of reality, may maintain stability of this holistic cognitive structure. In writing cultures, where the knowledge itself is stable, the holistic structure may have to be sacrificed.

A major modern argument for the introduction of a writing system into a community has been that it can serve to record and maintain aspects of tradition that might otherwise die out. Writing will record only part of any traditional knowledge—only the linguistic part, which is not necessarily the most important aspect. And it can be argued that it will not generally function to maintain knowledge, and may even hasten the "death" of tradition, (depending on the degree to which systems become important in the transmission of those traditions), in the following ways.

(a) If tradition is transmitted through writing, the paralinguistic and contextual factors will be missing. Writing has not yet become a powerful enough tool in most recently-written languages to play a major role in transmission; but tape-recording has come to play this role in many instances. For example, young Havasupals primarily learn songs from tape recordings now. They learn the songs, but they know nothing about their ceremonial context, their history, their meaning, or their powers to help or harm. As an example from elsewhere, Navajo medicine men generally refuse to allow apprentices to record songs because they deem that the learning of songs from recordings would be meaningless and rote. (John Farella, personal communication.)

(b) The recording of knowledge creates a model that can thenceforth be copied. To extent that people depend on recorded models (whether written or taped), to that extent the knowledge becomes rigid, unchanging.

(c) If the tradition is rigid and unchanging, it may become less and less suited to the world views of the people exposed to it, and thus more and more likely to be rejected as a meaningful part of their lives.

From this framework, let us examine some of the realized and potential effects of the Havasupal writing system. It will first be noted...
that while the Havasupais have had the opportunity to accept or develop a writing system for at least a hundred years, it is only two years ago that they actively began to seek the development of a writing system. There may be many reasons for this: but it can partly be attributed to the developing belief among the Havasupais that tradition should be static. The desire to stop their language from changing and to keep the stories and songs static was an impetus for developing a way of recording them; in turn, the writing system can successfully serve their desire to create a stasis of tradition. At the same time, tape-recording of stories and songs has become popular, also to create stasis.

The HBLEP team members are creating a dictionary that amounts to a kind of language engineering, in that it only allows the entry of "old words"; many words used by young people are purposefully being left out. There are arguments developing over differences in idiolect, with some adhering to the notion that no alternatives in pronunciation, lexicon or syntax are allowable. (Students of language change have argued that the presence of alternatives is the very root of language change, e.g., see Labov, 1972). Havasupais are also using recordings (both written and taped) as models for songs and stories, and some are expressing anxiety over the possibility of relating a song or story differently from a recorded model.

The desire to keep language and tradition static can be seen as a response to various pressures contributing to the erosion of these traditions. But we are suggesting here that the Havasupai systems of recording—both tape and writing—are themselves becoming parts of a feedback system of increasing rigidification of tradition, and disappearance of all non-linguistic context of knowledge, and that this is an actual symptom of erosion itself. The rigidification of traditional knowledge in the face of overall cultural change further helps set up a situation where the knowledge must be rejected as untrue or useless.

The Havasupais have pursued the development of a writing system partly because they see the traditions disappearing and wish them to be maintained. But they—and linguists—must realize that writing and taping will serve only to record, not to maintain, those traditions.

Conclusion. The Havasupai Bilingual Education Program is now in its second year. The staff was increased at the beginning of the second year, and at present all full-time staff are native Havasupai speakers, working with only occasional assistance from outside consultants. The staff began working in the classroom from the start of the program, with an oral teaching program, and the number of hours that Havasupai is used in class has been steadily increased. The staff members have produced written materials for use in the classroom, and are now teaching the Havasupai spelling system in the schools as well as in an adult education class in the evenings. A column written in Havasupai appears regularly in the community newspaper, and attempts are being made to translate posters and notices on the community bulletin board into Havasupai. Plans are underway to print reading primers for the teaching of reading through the medium of Havasupai language. Gradually the
written language is finding its way into the community as a medium of written communication.

The alphabet that has resulted from a year or more of cooperative efforts is "imperfect" from a linguistic point of view: It has more symbols than a linguist would like to see, includes digraphs, and looks altogether different from the phonemic system that has been postulated for that language. Furthermore, it is fairly different from the systems being developed for related languages, even mutually intelligible languages—so that a comparison of data in the practical writing systems might lead people to believe that Havasupal is more different from other languages than it actually is.

On the other hand, the alphabet is relatively easy to learn, and easy to type, and fits the bilingual situation of the Havasupals in that it has a fit with the English alphabet where the sounds in the two languages are alike, and utilizes non-English symbols for sounds different from English. It also reflects a more realistic model of the contemporary Havasupal language than the starting model did; and it adequately reflects the Havasupal desire to maintain a strong distinction between themselves and other tribes. In any case, it must be the community who will utilize the writing system that is the final arbiter of its nature and role—not the linguist.
1. The ideas in this paper are the results of input from many sources. As will be seen throughout, the other members of the Havasupal Bilingual Education Team and many members of the Havasupal Tribe must be acknowledged as the authors of many of the ideas discussed here. Also, acknowledgement and thanks are due to Dr. Beverly Crane and Dr. James Bartlett, who recently taught a course with one of the authors on the impact of writing systems. Many concepts developed as a result of the three-way interchange between the three professors appear throughout this paper.

2. This philosophy is legally supported by the Supreme Court decision of a few years ago which maintains that American children have the right to be educated in the language they know best.

3. Hualapai, there is no length distinction between "man" and "bullet"; it is only a matter of aspiration vs. non-aspiration. Also in Hualapai, the referents for [pʰu] and [pu] are reversed—which is, [pʰu] is "gun" and [pu] "bow".

4. One particularly relevant study is the study of linguistic diversity in Southwestern Indian languages by Elizabeth A. Brandt (Brandt, 1975), which shows that loss of diversity is by no means a one-way street, but which, in the languages she studied, shows an oscillation between generations, suggesting a notion of cyclicity in language change.

5. In all the Havasupal aspirated forms, conclusive evidence of their origin in an hC form comes from comparative evidence (Wares, 1968). Many other Yuman languages still retain [h] or [x] in the initial position in these words.

<table>
<thead>
<tr>
<th>Modern Havasupal</th>
<th>Other languages (from Wares, 1968)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[tʰa] (reed)</td>
<td>Mojave ahtás; Maricopa xtalš; Cocopa xčás/xčå</td>
</tr>
<tr>
<td></td>
<td>Diegueño textå; Palpai xtå</td>
</tr>
<tr>
<td>[pʰu] (bow)</td>
<td>Yavapai hupů; Palpai x hô</td>
</tr>
<tr>
<td>etc.</td>
<td></td>
</tr>
</tbody>
</table>

6. It also occurs in rare onomatopoetic forms, such as [gĩŋagĩŋ], the sound a small bell makes. Otherwise [ŋ] occurs only in vocabules in songs.

7. Elimination of shadow vowels results in clusters of two occurrences of the same consonant:

   qqot [ɡeqôt] "fox"
   hwagg [hʰagag] "two"
   jjtihulgi [jajaθulgiwi] "they washed it"
There was some resistance to writing these double consonant sequences without an intervening vowel. Presumably under the influence of English double consonant spellings, it was felt that something was needed to insure that the sequence would be interpreted as two separate sounds. Thus the staff employed a spelling rule of writing a between like consonants: g-qot, hwag-g, j-jthulgwii.

8. An illustration of this principle is made in Goody and Watt, 1962, where the tale of the origin of chieftoms in Gonja (Northern Ghana) was discussed. The tale once said that the original chief had seven sons, and that he had divided the land among them to form the seven chieftoms. Sixty year later, however, two of the chieftoms had been disbanded, so that only five remained. At this time, the tale said that the original chief had had only five sons.

A more general illustration can be found in the Navajo religion, where the horse—introduced by the Spaniards into the New World in the sixteenth century—has taken on a central position in the oral religious tradition to match its centrality in Navajo life.

9. For example, the Bible has lost credence among many, because it makes so many statements that no longer fit with our notions of social or factual reality. Presumably, if our religion were based on oral tradition, the traditions would have changed fluidly over time to avoid the conflict we presently find between our perception of reality and what has been written.
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ANNOUNCEMENT

The Proceedings of the First Yuman Languages Workshop, published in this series last year, are now out of print. They are available in either microfiche or hard-bound copy from the ERIC Clearinghouse. This volume will also be available from the ERIC Clearinghouse after it goes out of print.

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1976 HOKAN-YUMAN LANGUAGES WORKSHOP

James E. Redden, Editor

Held at
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In 1970 numerous linguists working on Hokan and Yuman languages were invited by Margaret Langdon to attend a conference at the University of California, San Diego. This made it possible for specialists to get to know each other and to learn in detail what each other was doing. The meeting was so successful that participants soon began asking when we would meet again. In 1975 Margaret Langdon invited the Yumanists to a workshop in conjunction with the research being done at the Yuman Languages Archives which she had established with the aid of a National Science Foundation grant. Again, the participants felt that the workshop was so successful that we ought to meet every year if possible. In 1976 another workshop was held at UCSD to which both Hokanists and Yumanists were invited. These proceedings are the result of that workshop. It is now expected that Hokanists and Yumanists will meet every year. The 1977 meeting will be at the University of Utah in Salt Lake City.

The participants of the 1976 Hokan-Yuman Languages Workshop gratefully acknowledge all the work that Sandra Chung and Pamela Munro did in organizing and running the workshop. Thanks are also due to Donald Crook and Susan Norwood for looking after the many details that helped make the workshop run smoothly.

Unfortunately, everyone who presented a paper at the 1976 Hokan-Yuman Languages Workshop was not able to prepare a final version for inclusion in this volume before it went to press. All the papers in this volume were presented in an earlier version at the 1976 workshop except the ones by Langdon and Webb, which were not ready in time for presentation for the workshop. However, since many of the points they contain were discussed at the workshop, they are included here.

The papers are presented according to the groups of languages presented at the workshop. Since there were some last minute changes in the program, I must plead faulty memory if I inadvertently placed some papers in an order different from that of the workshop presentation. The Langdon and Webb papers are included in the appropriate groups.

James E. Redden
Carbondale, May 1977
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