

How the Summer Institute of Linguistics has developed orthographies for indigenous languages of Mexico

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Abstract

This article summarizes the ways in which SIL has designed orthographies (alphabets) for modern indigenous languages in Mexico, in conjunction with other organizations and agencies. General linguistic issues and orthographic principles are discussed first, then three different periods of orthographic design.

Resumen

[Cómo el Instituto Lingüístico de Verano ha formado ortografías para las lenguas autóctonas de México]

Este artículo resume la forma como el ILV, en conjunción con otras organizaciones y entidades, ha formado las ortografías (los alfabetos) para los distintos grupos de lenguas autóctonas modernas de México. Habla primero de los asuntos generales de la lingüística y de los principios ortográficos; después habla de los diferentes períodos de diseños ortográficos.

O. Overview

This article presents a summary of the ways in which the Summer Institute of Linguistics in Mexico has developed orthographies for speakers of indigenous languages. In sixty-five years of carrying out this task, SIL has related to indigenous groups, government agencies, and other individuals and organizations interested in these languages. This interaction has influenced its policies and sometimes led to changes in them. In this article, I first discuss the linguistic basis for orthography design from a historical perspective. Then I discuss sociolinguistic forces that have shaped SIL orthography policy over the years.

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<http://www.sil.org/americas/mexico/ilv/L001i-SILOrth.pdf> [October 1999, corrected November 1999]

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My information comes from three sources. The first source is the orthography file of the Mexico branch of the Summer Institute of Linguistics. This file contains an orthography statement for every language in which SIL members have worked in Mexico. It also contains information on the phonological analysis of the languages and on orthography testing, including correspondence between SIL members and their linguistic consultants. The second source of information comes from interviews with SIL members. Among them, I would like to acknowledge especially Velma Pickett, Inez Butler, Ethel Wallis, Otis Leal, Susan Huggins, Charles Speck, Barbara Hollenbach, Amy Bauernschmidt, and Stephen Marlett. The writings of Pike and Bauernschmidt provided the third source.¹

1. Linguistic issues and general orthographic principles

In this section, I give a brief review of the general linguistic issues and orthographic principles on which SIL orthographies have been constructed.

1.1 The linguistic basis for orthography design

A key concept in SIL orthography design is that orthographies should be based as much as possible on the linguistic structure of the languages being represented, beginning with (but not limited to) phonemic contrasts. Sometimes, however, other considerations have taken priority, such as writing a word or affix with a consistent spelling even when its pronunciation changes somewhat in different contexts. This is often referred to as morphophonemic writing, and a good example is found in the English plural suffix, which is written consistently as *s*, even though it is often pronounced as *z*, which is a different phoneme in English.

1.1.1 The influence of Kenneth L. Pike

SIL members began doing fieldwork in Mexico at a time when modern linguistic theory was at an early stage of growth and sophistication. One of these early SIL fieldworkers was Kenneth L. Pike, who was later also affiliated with the University of Michigan. Pike developed a theory of phonology based on the needs he and his SIL colleagues had in writing the languages they were studying. A key element in this theory was the relationship between phonetics and phonology, and these ideas are found in his books, *Phonetics: A critical analysis of phonetic theory and a technic for the practical description of sounds*; *Phonemics: A technique for reducing languages to writing*; and *Tone languages: A technique for determining the number and type of pitch contrasts in a*

¹ I thank Albert Bickford, Barbara Hollenbach, Charles Speck, David Tuggy, and Elizabeth Willett for editorial help in preparing this article. All errors are, of course, my own.

language. The theories found in these books provided much of the linguistic basis by which SIL fieldworkers wrote the languages they were studying.

1.1.2 Careful vs. fast speech

Orthographies should be based on careful (but not exaggerated) speech. For example, it is well known that while some native speakers of English say *pteto* in fast speech, they prefer to write *potato* because they do not recognize initial *pt* clusters as being psychologically real.

1.1.3 Word breaks

In designing orthographies, one needs to decide whether to break up compound words or to write them as single words. For example, in Texmelucan Zapotec, *ru* means ‘cough’, and *lagy* means ‘liver’. Taken together, they mean ‘miss’. Speakers of this language choose to write this combination as *rulagy* because they are more aware of the meaning of the whole than of the meaning of the parts.

In deciding how to write compounds, it is helpful to ask two questions: (1) are there phonological factors which show the presence of a word break? and (2) do native speakers think of them as a unit or not? For example, the word *manifold* originally came from the words *many fold* but has fused historically so that native speakers of English no longer recognize the parts. This compound is now a single word and should be written as such. Other compounds like *ten-gallon hat* do not show any fusion even though the meaning of the unit is idiomatic. In English, the conventional spelling for the above compound shows the parts clearly because they are separated by a hyphen or a space. In other languages, compounds like *ten-gallon hat* can be written either as separate words or as a single word.

As with other orthographic decisions, the decision about how to write compound words is usually made by working closely with native speakers and carefully observing their reactions. SIL field workers have found that people in indigenous communities can often learn to read their language either with compound words broken up or written as single words, but long words are usually more difficult to read.

1.1.4 Features that extend over several segments

Finally, certain linguistic features may extend over more than a single consonant or vowel. Features such as these may be written as a single letter which represents the feature carried by letters before it, after it, or on either side of it. Or, the feature may be written onto all of the letters which carry it. For example, nasalization is predictable on the word level in Mixtec. In Atlatluuca Mixtec, nasalization can be predicted by the

following rules proposed by Marlett (1992:427): (1) “Nasalization occurs on the right edge of a word and spreads to the left...;” (2) “...Nasalization spreads to adjacent sonorants...;” and (3) “...Nasalization spread is blocked by obstruents....” Obstruents are consonants like *p*, *t*, and *k*, while sonorants are consonants like *n*, *l*, and *y*. Below are some examples of both oral and nasal words from Atlatlahuca Mixtec found in Marlett (1992:427), written in what Marlett calls an intermediate level of representation. Note that I use a superscript letter *n* (ⁿ) after a vowel to indicate nasalization, while Marlett indicates nasalization by a tilde (~) over a vowel:

Oral:

kuka ‘rich’
yuyu ‘dew’
kaa ‘metal’

Nasal:

yatiⁿ ‘near’
naⁿniⁿ ‘long’ (plural)
ñiⁿiⁿ ‘salt’

Since Marlett shows that nasalization in Mixtec spreads from the rightmost edge of a word, nasalization could theoretically be written by using only a word-final *n*. A word-final *n* should predict that at least some of the vowels in the word will be nasalized and also certain consonants. Besides a nasalized word having at least some nasalized vowels, the word will have nasal consonants like *m* or *ñ* instead of *w* or *y*. Thus, [ñiⁿiⁿ] ‘salt’ could theoretically be written *yin*, and [miⁿiⁿ] ‘trash’ could theoretically be written *wi’in*.

A practical problem with this theoretical approach is that Mixtec speakers are taught in public school to write the contrast between nasal *m*, *n*, and *ñ* and oral *w*, *nd*, and *y*. Another problem is that Spanish orthography does not distinguish between nasal and oral vowels. Even though nasalization does occur on vowels if they are next to *m*, *n*, and *ñ* in Spanish, the nasalization is below the level of awareness for people whose first language is Spanish.

The Mixtec Academy (see section 3.3.1 below) is not in full agreement on how to write nasalization in words that have nasal consonants. For example, some Academy members want to write [nuⁿuⁿ] ‘face’ as *nuu*, while others want ‘face’ written as *nuun*. Some members of the Academy want to write words like [miⁿiⁿ] ‘trash’ as *mi’i*, and others as *mi’in*. Below are some examples of how the Mixtec Academy has chosen to write nasalization. For contrast, I also provide examples that follow the strictly theoretical approach to writing mentioned above. Note that I write the oral equivalent of *n* as *nd*, because this is the usual nonnasal equivalent of Mixtec *n*:

| Pronunciation | Mixtec Academy orthography | Theoretical orthography |
|--|----------------------------|-------------------------|
| [yati ⁿ] ‘near’ | yatin | yatin |
| [na ⁿ ni ⁿ] ‘long’ (plural) | nani / nanin | ndandin |
| [mi ⁿ i ⁿ] ‘trash’ | mi’i / mi’in | wi’in |
| [nu ⁿ u ⁿ] ‘face’ | nuu / nuun | nduun |

1.2 Orthographic policies

In a 1964 article entitled “How shall I write this language?,” William A. Smalley noted five principles in order of importance for designing a successful orthography. SIL has followed all five of these principles, though some of them have not been as significant in Mexico as they have been in other parts of the world.

1.2.1 Maximum motivation

According to Smalley, the most important principle in orthography design is choosing an orthography which is best accepted by the indigenous society and other important groups, such as the national government. For example, speakers in some parts of Africa prefer an orthography modeled after that of French, while in other parts of Africa, speakers prefer an orthography modeled on the Arabic script. With some exceptions (e.g., the use of *k* instead of *c/qu*), speakers of indigenous languages in Mexico currently want their language to look like Spanish. SIL orthographies have followed this preference since the late 1950s. Prior to that, SIL field teams used orthographies with some specialized linguistic symbols based on advice from non-SIL linguists. See my comments on the *Consejo de Lenguas Indígenas* in section 3.1 below.

1.2.2 Maximum representation of phonemic contrasts

Key for SIL and second in importance for Smalley is an orthography which aims at a one-to-one representation of the phonemic contrasts of the language. This principle characterizes SIL orthographies throughout the time SIL has served in Mexico. This one-to-one representation is also a goal for representing suprasegmental contrasts such as tone and laryngeal features, but it is harder to achieve. Admittedly, not all field teams did a thorough phonological analysis of the tone system. Nevertheless, a one-to-one relationship between the phonemic and orthographic levels has consistently been an important goal for SIL orthographies.

1.2.3 Maximum ease of learning

Third in importance for Smalley and also important for SIL orthographies is the ease with which the orthography can be learned. For example, a vowel without an accent is easier to learn than one with an accent, and a vowel with an acute accent is likely to be confused with the same vowel with a grave accent. A consonant phoneme which is represented by a single letter is easier to read than one written with a combination of letters. If combinations must be used, then it is best if they are used systematically and consistently rather than in a hit-or-miss manner.

In 1977, Amy Bauernschmidt published an article entitled “The ideal orthography” in *Nova Lit*, a publication of SIL in Mexico concerned with literacy issues. In this article Bauernschmidt makes the following observation about ease of learning (page 2):

When choosing symbols it is also necessary to anticipate the teaching and learning problems that might arise with the multiple use of certain symbols. If there are several digraphs, try to avoid using the same symbol in more than one of these. For example: (x, xh, dx) and (h, ch, sh) and (s, ts, sh). In these sets of three the x, h and s are used to represent different values. It is sufficient to use one single letter and one digraph. The second digraph may add too much to the memory load to be useful.

1.2.4 Maximum transfer into the national language

Since the late 1950s, SIL has attempted to use the national Spanish orthographic conventions as much as possible. An advantage of this policy is that speakers of indigenous languages who learn to read in their own language can transfer their reading skills into Spanish with relatively little difficulty, and vice versa. Since indigenous Mexican languages often have more phonemic contrasts than Spanish, the transfer is usually not maximal, but this is a goal of SIL orthographies. In section 2, I mention some of the differences between the phonemic systems of Spanish and Otomanguan languages in particular.

1.2.5 Maximum ease of reproduction

When possible, SIL linguists adapt their orthographies to the standard Spanish keyboard, as Bauernschmidt suggested in her *Nova Lit* article (1977:3):

Ideally, the symbols chosen should be available on the standard Spanish typewriter keyboard, printing presses or typesetters. The first mentioned is very important as more and more indigenous people learn to write their language and some obtain their own typewriters. They will not feel charitable toward an orthography which they can't handle on their own

typewriters. We need to realize that it is unfair to all concerned when we use diacritics, tone marks and other symbols which only we have access to on our own personal typewriters or in our own publications department.

Nevertheless, there are a number of exceptions to this principle, such as the use of a caret (upside-down letter ν) for a central vowel in various languages.

1.2.6 Other factors affecting SIL orthography design

In addition to the principles listed by Smalley, other factors have also guided SIL orthography design. Some of the more important ones are: uniformity among related languages, the need for testing, and cooperation with outside agencies.

1.2.6.1 Uniformity among related languages

There has been a growing realization that it is desirable to write similar or identical sounds in closely-related languages with the same symbol(s). Early linguistic research tended to view languages as unique. For this reason, SIL fieldworkers from the earliest periods did not consider it important to follow what their colleagues in related languages were doing, and early SIL orthographies for closely-related languages differ where there are no phonological differences. Because of a major change in linguistic theory that started in the 1960s, linguists became more interested in discovering linguistic universals. SIL field workers also began to show an interest in establishing linguistic relationships between the languages they were working in, and their work reinforced the new perspective on language, which led to a shift in SIL orthographic policy.² The new policy states that for closely-related languages, there should be no difference in the orthography if there is no phonological difference.

1.2.6.2 Testing

SIL fieldworkers have always understood that any orthography needed to be tested to see if native speakers could learn to read it, or if they considered it acceptable for other reasons. This testing has usually been carried out in an informal way, using a trial-and-error method. Linguists print materials in the proposed orthography, and teach people to read it. They observe native speaker reactions and adjust the orthography accordingly until the fewest problems are noted. The correspondence between field teams and orthography and linguistics consultants found in the Mexico branch orthography file makes very little mention of testing. This does not necessarily mean that little or no testing was being carried out, but rather that testing was usually done informally.

² Examples of comparative studies by SIL field workers in the Otomanguean language stock are Gudschinsky 1953, Longacre 1957, Bartholomew 1959, and Rensch 1976.

1.2.6.3 Stages of orthography development

Current SIL policy defines three stages of approval for a field team's orthography: tentative, working, and established. A field team with a tentative orthography is permitted to distribute a limited number of test copies, but not to publish materials. A field team with a working orthography is permitted to publish anything except a major work, such as a dictionary, for which established orthography status is required. This system of orthographic approvals was first described in Bauernschmidt's 1977 article in *Nova Lit*, and it began to be enforced as a policy at about the time the article was published.

It is important to note that the term "established orthography" is relative. It means that an SIL field team has tested the orthography enough to show that it is linguistically adequate and that people can learn to read it. The term does not imply that the orthography has community consensus. This lack of consensus may be partly due to the fact that some indigenous communities do not have a set of recognized leaders with the authority to speak on behalf of the entire community. Nor do SIL field linguists necessarily have an official connection to any group of community leaders. The printed materials that SIL linguists produce often act as a catalyst which stimulates the community to produce its own written literature. Once stimulated, the community sometimes chooses to write its language differently from that of the "established orthography" used by the SIL team. In this sense, all SIL orthographies are intended as initial orthographies--tentative in nature and amenable to reform.

1.2.6.4 Cooperation

Finally, SIL orthographies have always tried to meet the needs of indigenous communities, while cooperating as much as possible with outside agencies which also have an interest in these communities. In section three, I discuss how these influences have affected the design of SIL orthographic policy at various times.

2. Linguistic issues in specific language families

Based on a study of orthography-related correspondence between field teams and SIL orthography consultants from 1950 to 1994, the following ranked list of linguistic features presented the most frequent challenges in orthography design:

- Vowels (including nasal vowels)
- Consonants
- Tone
- Stress
- Syllable definition

Word breaks
Affixes
Punctuation

This orthography-related correspondence mentions about thirty different indigenous languages. Not surprisingly, Otomanguean languages are mentioned most frequently because languages from this stock usually have many tone and laryngeal features, which are difficult to represent orthographically. There are no standard Spanish symbols for these features, and native speakers are usually not as aware of them as they are of vowels and consonants.

For example, there is a contrast in syllable dynamics commonly found in Chinantec and Amuzgo called “ballistic” (louder with rapid fade of intensity) and “controlled” (softer but more sustained). SIL members working in Chinantec most often write an acute accent over vowels in ballistic syllables, while vowels in controlled syllables are written without an accent.

Otomanguean languages commonly exhibit a contrast between plain vowels and one or more kinds of glottalized vowels. For example, Zapotec typically has both laryngealized vowels, often written as a double vowel (VV), and checked vowels, often written with a vowel followed by an apostrophe (V'). Trique and some varieties of Zapotec also have aspirated vowels, often written with a vowel followed by a *j* (Vj).

While most of these contrasts can be written by using the symbols found on a standard Spanish keyboard, fully representing them makes the languages look decidedly unlike Spanish. Many speakers of these languages want to avoid this appearance, and SIL workers have sometimes chosen not to write all of these distinctions in order to better serve the indigenous communities in which they work.

As with laryngeal features, the representation of tonal contrasts is another frequent issue in orthographic design for indigenous languages, especially for those in the Otomanguean stock. Some varieties of Trique and Chinantec have five distinct levels of tone, plus tone glides. Linguists often mark this high level of complexity with numbers. For example, the number *1* can represent a high tone, and a sequence of numbers can represent a glide (e.g., *13* for a high-low glide in a three-level system). While linguists would tend to be satisfied with this, members of indigenous communities and others often feel that using numbers makes the written form of these languages appear too “non-Spanish,” and press for using accents (as in Spanish). The latter approach nevertheless tends to blur linguistic contrasts. For example, if in Chinantec an acute accent marks ballistic syllables, using acute accent to represent high tone as well would create confusion.

In sum, SIL field teams have often had to choose orthographic representations for sounds and features not found in Spanish that represent a delicate balance in following

conflicting principles. For more discussion on SIL orthography standards, see the discussion of “The ideal orthography” below in section 3.2.

3. Periods of orthographic design

Over the years, SIL's policies have changed according to the ways it has tried to meet the often conflicting needs and desires of people inside and outside of indigenous communities.

3.1 Linguistic orthographies (1934 to the late 1950s)

During the early period, outside linguists played a major role in telling SIL teams how its orthographies should look. This is especially true of the *Consejo de Lenguas Indígenas* (Council of Indigenous Languages). The *Consejo* was a high-level governmental organization composed of linguists. It was under the supervision of the Mexican Institute of Linguistic Investigation founded by Dr. Mariano Silva y Aceves, who was himself a member of the *Consejo*. Another prominent member of the *Consejo* was Morris Swadesh.³ According to Velma Pickett and Otis Leal, Swadesh wanted orthographies to be “linguistic” orthographies, using standard phonetic symbols in standard ways. Swadesh’s preferences came into conflict with the desire of William Cameron Townsend, the founder of SIL. Townsend, as well as Pike, wanted to write indigenous languages to look as much like Spanish as possible.

There were naturally some clashes with the national (Spanish) orthography. Pickett mentions that she initially tried to write the velar stop with *g*, rather than the *gu* of the national orthography, before the front vowels *i* and *e*. Whenever Isthmus Zapotecs had learned to read in Spanish, however, they would inevitably mispronounce words with *gi* and *ge* in them. Eventually, she had to adopt the Spanish conventions over the more linguistically “pure” orthography. By the late 1950s, Swadesh apparently also recognized the influence of the national orthography on indigenous speakers and supported such approaches.

Otis Leal recalls a clash between what he and his Zapotec co-workers wanted and what members of the *Consejo* wanted in writing retroflexed consonants in Villa Alta Zapotec. He did some careful testing, and the local Zapotec speakers unanimously voted for single consonants with diacritics instead of the digraphs some of the members of the *Consejo* wanted. However, one member of the *Consejo*, María Fernández de Miranda, was convinced that Leal and the Zapotecs should use diacritical marks, and she used her influence in the *Consejo* to allow him and his Villa Alta Zapotec co-workers to write Villa Alta Zapotec the way they felt it should be written.

³ Some other members of the *Consejo* were Ing. Roberto Weitlaner, María Teresa Fernández de Miranda, and Wigberto Jiménez Moreno.

3.2 Spanish-based orthographies (late 1950s through late 1980s)

From the late 1950s through the mid 1970s, the main trend in orthography design was the pressure to adapt to the national (Spanish) orthography whenever possible. The Mexican department of education wanted the indigenous people to learn to read and write in Spanish, so they wanted the indigenous languages to look as much like Spanish as possible.

Due to a change in attitudes of Mexican governmental agencies from the late 1970s through the late 1980s, the major development in Mexico SIL orthographies during this time was to allow certain non-Spanish characters (e.g., *k* rather than *c/qu*), though there was still strong pressure to adapt to the Spanish orthography in general.

Bauernschmidt's December 1977 *Nova Lit* article, "The ideal orthography," was written during the middle of this period. Bauernschmidt was the primary orthography consultant for SIL at this time, and she was summarizing SIL orthography policies rather than developing new ones. The following is a summary of Bauernschmidt's article:

- Orthographies must be balanced between two extremes: redundancy of symbolization and built-in ambiguity or underdifferentiation.
- Orthographies are based primarily on a good phonological analysis, though there is careful attention given to psycholinguistic, sociolinguistic, and practical factors.
- Generally, orthographies for indigenous Mexican languages should look as much like the Spanish orthography as possible. This includes using only the diacritical symbols available on a standard Spanish typewriter. The article includes lists of acceptable symbols for consonants and vowels. Symbols for different consonant modifications include palatalization, labialization, aspiration, and glottalization. Symbols for different vowel modifications include nasalization, length, tone, ballistic and controlled syllables, and complex vowel nuclei.
- Tone may be written with either superscript numbers after the syllable or with diacritics over the vowel.
- Ratings for orthographies are "tentative," "working," and "established."

Bauernschmidt's article included comments on "miscellaneous orthographic problems," including punctuation, proper nouns, accent, enclitics, loan words, and morphophonemic writing. At the end of the article, a standard form was supplied for "statement of current orthography" and a supplementary sheet for reporting various linguistic features and how they are orthographically represented. A revision of these forms is still in use internally in SIL as an aid to orthography design.

There has been little change in SIL orthography policies from the 1970s to the present, although during the 1980s and 1990s, there has been more freedom to experiment with non-Spanish orthographies. The *Instituto Nacional Indigenista* and other government-backed agencies favor the use of *k* rather than the Spanish *c* and *qu*, and the corresponding use of *g* before all vowels, rather than the Spanish *gu* before *i* and *e*.

A significant development, which began in the late 1980s, is that Mexican government agencies and teachers have been turning to SIL as a source of information and help in their attempts to do literacy and linguistic research among their own minority languages.

3.3 Language group self-determination (the 1990s)

According to Stephen Marlett, a significant development which began in the late 1980s and is picking up momentum in the 1990s is the emergence of language-specific groups who would like to establish a standardized orthography for all varieties of their language. I am currently aware of developments of this kind among several Otomanguan languages (Otomí, Chocho, Mixtec, and Zapotec). Since my best information is on the Mixtec and Zapotec groups, I summarize them as being representative of the others.

3.3.1 *Ve'e Tu'un Savi (Academia de la Lengua Mixteca)*

In April of 1997, a group of Mixtec leaders formed the *Academia de la Lengua Mixteca*, which is known in Mixtec as *Ve'e Tu'un Savi*. One of the main purposes of this Academy is to decide on an official orthography that can be used to write all varieties of Mixtec, and to establish and maintain norms for writing the language. For a number of years preceding the formation of the Academy, an organization named *CID-Ñuu Savi (Centro de Investigación y Difusión - Pueblo Mixteco)* sponsored conferences on writing Mixtec.

SIL linguists began participating in *CID-Ñuu Savi* conferences in 1994, and continue to relate to the Mixtec Academy members up to the present. SIL has also invited members of this group to participate in its workshops on grammar, dictionaries, and production of native-authored literature, and in its courses on basic linguistics and literacy.

3.3.2 *Encuentro de Pueblos Zapotecas*

The group that has developed among Zapotec speakers in Oaxaca began at roughly the same time as the Mixtec group. In 1993, Michael and Priscila Piper, Velma Pickett, and María Villalobos attended the *Segundo Encuentro de Pueblos Zapotecas* in Juchitán. The meetings were sponsored by the *Casa de la Cultura de Juchitán*, with Lic. Vicente Marcial as its director. The express purpose of the meeting was to create a

standardized inventory of orthographic characters to represent the different phonemes found in Zapotec languages. The actual results fell short of the above goal and amounted to a listing of the different phonemes found in different Zapotec languages along with the way these have been orthographically represented. (For example, for the lenis alveopalatal sibilant, the Isthmus uses *x*, the Sierra Norte uses *ll*, and the southern mountain area uses *zh*.) Additional meetings were held in Guelatao in 1994 and 1995. Juan José Rendón was very involved in promoting these.

Another *Encuentro*, organized by Víctor de la Cruz of the *Centro de Investigaciones y Estudios Superiores en Antropología Social* in Oaxaca, was held in December 1997, at which representatives of SIL were asked to present their experiences in orthography development. Representatives of many Zapotec communities participated and continued to dialogue about the possibility of developing a uniform alphabet for the language, but there remain many unresolved questions, largely because of the great linguistic diversity within Zapotec.

4. Conclusions

The following observations summarize the policies that have governed the choice of SIL orthographies in Mexico:

- From the earliest period of SIL's involvement, they have been linguistically based.
- They usually represent a compromise among the conflicting principles of: (a) a one-to-one representation between the phonemic and orthographic levels, (b) the needs and desires of the indigenous community, and (c) the needs and desires of other outside organizations who are interested in the language and community.
- They are tested informally by observing native-speaker reaction until the fewest problems are encountered.
- They are intended as initial orthographies--tentative in nature and amenable to reform.

References

- Bartholomew, Doris A. 1959. "The structure of Proto Otomi-Pame," M.A. thesis, University of Pennsylvania.
- Bauernschmidt, Amy. 1977. "The ideal orthography," *Nova Lit* 5.3. 1-8.
- Gudschinsky, Sarah C. 1953. "Proto-Mazatec," *Memoria del Congreso Científico Mexicano* 12. 171-74.
- Longacre, Robert E. 1957. *Proto-Mixtecan*. (Indiana University Research Center in Anthropology, Folklore, and Linguistics, Publ. no. 5.) Bloomington, Indiana: Indiana University.
- Marlett, Stephen A. 1992. "Nasalization in Mixtec languages," *International Journal of American Linguistics* 58.4. 425-435.
- Pike, Kenneth L. 1943. *Phonetics: A critical analysis of phonetic theory and a technic for the practical description of sounds*. (University of Michigan Publications in Language and Literature XXI.) Ann Arbor, Michigan: University of Michigan.
- 1947. *Phonemics: A technique for reducing languages to writing* (rev. ed.). (University of Michigan Publications: Linguistics III.) Ann Arbor, Michigan: University of Michigan.
- 1948. *Tone languages: A technique for determining the number and type of pitch contrasts in a language*. (University of Michigan Publications: Linguistics IV.) Ann Arbor, Michigan: University of Michigan.
- Rensch, Calvin R. 1976. *Comparative Otomanguean phonology*. (Language Science Monographs Vol. 14.) Bloomington, Indiana: Indiana University.
- Smalley, William A. 1964. "How shall I write this language?," pp. 31-52 in *Orthography studies*, ed. by William A. Smalley. Amsterdam: North-Holland Publishing Company.