Phonetic adaptations of Spanish loanwords in Triqui

Ruth E. Scipione
University at Albany, State University of New York, ruth.scipione@gmail.com

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PHONETIC ADAPTATIONS OF SPANISH LOANWORDS IN TRIQUI

By

Ruth Scipione

A Dissertation

Submitted to the University at Albany, State University of New York

in Partial Fulfillment of

the Requirements for the Degree of

Doctor of Philosophy

College of Arts & Sciences

Department of Languages, Literatures and Cultures

2011
This study focuses on the results of increased language contact on Spanish loanword adaptation in Copala Triqui at the segmental and prosodic levels. Data from field notes and publications from the 1960s and 1970s were compared to modern 21st century loanword adaptations in 80+ hours of radio broadcasts and recorded elicitations in personal fieldwork in Mexico, Central California and Albany, NY. The overarching goal is to identify a wide range of possible phonetic adaptations at the segmental and prosodic levels and track the possible effects of increased bilingualism on these adaptations. From there it attempts to hypothesize what phonetic variation may indicate more generalized contact induced change in Copala Triqui.

The results indicate that closed systems such as segmental and prosodic inventories are resistant to contact induced change. In this case study, even though bilinguals are able to produce foreign sounds in the context of loanwords, more consistent use of foreign sounds happens as a result of internal shifts in progress. In order to understand segmental shift it is useful to look at the phonetic system as a whole rather than at the possible importation of individual phonemes. In the case of Triqui, the obstruents and rhotics may be on their way to converging with the Spanish obstruent and rhotic systems.

At the prosodic level it is clear that adaptation follows more stringent rules and shows much less variation. Four different patterns of stress in Spanish - ultimate, penultimate, antepenultimate and ultimate stress with sibilant coda- translate into four consistent tone patterns with no exceptions. The only confirmed shift is the reduction of historically
complex loanwords with multiple lexically-linked tones to simple words with one word-
final tone, a process that is relatively common in this language. Only recently do two
innovations in adaptation occur: the first is a new tone pattern accompanied by a word-
final aspirated laryngeal and the second is a possible maintenance of Spanish stress. The
cause of these two innovative adaptation patterns has not yet been determined but it is
likely that they are related.
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**Symbols and Abbreviations**

1S = first person singular  
2 = second person  
3 = third person  
Adj. = adjective  
Adv. = adverb  
AmPort = American Portugues  
C = consonant  
COM = completive aspect  
CON = continuative aspect  
COP = copulative  
Def = definite  
Decl = declarative  
Eng = English  
F1 = Formative Rule 1  
F2 = Formative Rule 2  
F3 = Formative Rule 3  
Fre = French  
G = Grammar  
Ger = German  
Iterj. = interjections  
Jap = Japanese  
L = laryngeal feature  

N + O = Nasal + Obstruent sequence  
Nas = nasal  
Obst = obstruent  
Part = particle  
PER = person  
PH = phonology  
POS = possessed form  
POT = potential aspect  
PL = plural  
Poss = possession  
Prep. = preposition  
RL = recipient language  
SL = source language  
Sp = Spanish  
Tr = Triqui  
V= vowel  
Ṽ = nasal vowel  
v. = verb  
WM = word medial  
WF = word-final
Phonetic Adaptation of Spanish Loanwords in Copala Triqui

Introduction

This study adds to a small but growing literature describing Copala Triqui by focusing on loanwords, which are an understudied and historically ignored area of many indigenous languages. It will also be one of the first to systematically describe possible changes happening in the phonemic inventory of Triqui. Language shift through contact happens when elements from one language, most often lexical items at the initial stage, enter into a recipient language. These elements are necessarily brought in by bilinguals (Poplack & Sankoff 1984; Paradis & LaCharité 1997) and go through various periods of instability before eventually establishing themselves in the receiving language (Thomason & Kaufman 1988). Loanwords have long been thought of as a vehicle by which foreign elements, in this case segmental and prosodic features, enter a recipient language. The process by which this change happens is less understood.

This dissertation examines patterns of adaptation and direct importation in loanwords as vehicles for phonetic/phonemic change. It is a case study that examines the relationship between direct importation of phonemic material and language variation, language change, and possibly language shift.

Loanwords are a peripheral part of any lexicon and for this reason they often behave differently from the native lexicon (Ito & Mester 1995; Paradis 1988). Since loanwords are brought into the lexicon by bilinguals, they may contain non-native sounds. While at first these sounds are adapted into native equivalents, in subsequent waves of adaptation by monolinguals it is not uncommon for source language sounds to become established in the language via the loanwords that contain them. Once
established in this limited context, they may eventually influence the native system, especially in situations of increasingly intense contact.

Along with numerous lexical borrowings, there usually ensue phonological changes in the recipient language; almost all the studies reviewed in section 3.1 indicate both alterations in the phonology of the borrowed words and subsequent adjustments in the phonology of the recipient language. Such alterations may include processes that apply only to the foreign-origin vocabulary, but may also spread to native vocabulary (Sankoff 2001).

It has been suggested that languages tend to borrow elements that fill a void or are in line with tendencies already present in the receiving language (Weinreich 1953; Thomason & Kaufman 1988). By analyzing the behavior of these sounds in the context of loanwords I am able to show how these patterns, taken from Spanish, are becoming established in Triqui by reinforcing oppositions that were historically neutral. More specifically, pre-existing internal shifts in Copala Triqui may be encouraging a convergence with the Spanish system. This is only partially due to increased access to Spanish phonotactic rules.

There are two areas of focus; each has its own set of research questions and is discussed in a separate chapter. Chapter 4 is concerned with adaptations at the level of the segment. The questions that this chapter tries to address are two. First, how are foreign and illicit segments in Spanish loanwords adapted into Triqui? And second, what is the role of increased bilingualism in this process? It can be expected that most sounds will be adapted into Triqui native segments and that these adaptations will be done in a way that remains most faithful to the input and Triqui phonotactic rules at the same time; however,
phonemic borrowing in Triqui has also been documented. This chapter takes a more systematic look at the phonetic adaptations of Spanish phonemes, repairs to illicit phonotactic structures from Spanish, and the extent to which phonetic/phonemic borrowing is happening in Copala Triqui. It also takes a closer look at the behavior of specific phonemes across different data sources to predict where these shifts found in loanwords may also affecting the native vocabulary.

Chapter 5 focuses on the prosodic adaptations of Spanish loanwords in Triqui. It first outlines the four established patterns of tonal adaption and describes the underlying tone for each. It then analyzes the ways in which adaptation may have taken place as loanwords were adapted by monolinguals. Finally, it identifies areas of possible change in adaptation and highlights some of the recent innovations in tonal adaptation of Spanish loanwords in Triqui.
Chapter 1

Lexical Borrowing: A Broader View

It would be difficult to find a language that has not been influenced by the other languages with which it has come into contact; however, the linguistic results of different contact situations are often difficult to predict. In some cases, words are directly imported in a language maintenance situation, in others, widespread bilingualism results in language shift and even language death. The linguistic results of this can be seen in Latin America where the Spanish colonizers introduced various terms into the native lexicons of the thousands of indigenous languages that existed at that time. As Spanish came to be used as a lingua franca by various indigenous groups, this contact intensified and started to produce different contact phenomena ranging from lexical intereference to morphosyntactic convergence and even the creation of new languages such as Media Lengua, a contact language that combines Spanish derived stems with Quechua morphology and grammatical affixes which emerged in the twentieth century, partially due to rapid urbanization. The fact that Spanish has had such a profound influence on the grammar and lexicon of the indigenous languages of Latin America while they collectively have only caused a few lexical items to be taken into Spanish can be explained by both structural and sociolinguistic factors.

This dissertation studies the phonetic adaptation of Spanish loanwords into Triqui; however, it is important to recognize that lexical adaptation of a non-native word is only one way in which these foreign concepts are brought into a language. Many other types of linguistic accommodations have been identified by Haugen (1950) and Weinreich (1953) who are the first authors to bring lexical borrowing into focus. In their attempts to
study the bilingual communities they grew up in—American Norwegian in the case of Haugen and American Yiddish in the case of Weinreich—they defined the terminology that has influenced how we study lexical borrowing today.

1.1 Defining Borrowing: Simple and Complex Units
Uriel Weinreich (1953) was one of the first to specifically address what he called lexical interferences.¹ According to this author, interference, or the introduction of foreign elements into the language of bilinguals, is not seen as a negative or limiting process but simply as a ‘rearrangement of patterns’ (Weinreich 1953). Lexical interferences are defined as ‘the transference of morphemes from one language to another, the expansion of designated functions of morphemes from one language to fit the models of usage in another language, or the combination of these processes’ (Weinreich 1953: 47). In his definition these lexical interferences are further broken down into simple units, complex units, and hybrids.

SIMPLE UNITS are the transference of single words or phrases that are transferred as one word. This can be outright transfer of phonetic sequence from one language to another or it can involve phonetic adaptation with little to no morphological adaptation. In addition, some adaptations happen without morphological assimilation such as bate from 'baseball bat', troca from 'truck', and torque from 'turkey'. Others show phonetic adaptation with some morphological assimilation as in the Spanish words percolador and

¹The terms interference and transference have long been confused. Interference generally has a negative tone, especially in SLA literature where it is often used to describe the involuntary influence of a second language learner's L1 on his or her L2.
asesamiento, which are phonetically and morphologically adapted from the English words 'percolator' and 'assessment'. Within this category Weinreick also includes compounds that are transferred in unanalyzed form as in the case of interjections like German *holišmok* from English 'holy smoke(s)!'. Simple units also include a semantic expansion of a native lexical item (often phonetically related) to incorporate a foreign meaning as can be seen in the semantic expansion of 'introduce' in Romance languages.

‘Introduce’, which originally only signified the insertion of one element into another, was expanded to include the English meaning 'to acquaint or present formally'. Lastly, simple units can be the alteration of a phonetically similar word to resemble the foreign word without any change in the meaning as in the use of *Uropa* in Floridian Spanish, mirroring English pronunciation, instead of using *Europa* as in standard Spanish.

**COMPLEX UNITS** are the transference of compound words and phrases. The first option involves the transference of an phonetically unanalyzed compound from donor language to recipient language as in the case of the American Spanish phrase *objetor consciente* from the English 'conscientious objector'. The second is reproduction of foreign terms and phrases in native terms, which is further divided into word-for-word LOAN TRANSLATIONS as in Portuguese *estar dereito* after the English phrase 'to be right', partially reproduced LOAN RENDITIONS as in German *Vater-land* from Latin 'patr-ia' and LOAN CREATIONS, which are invented to fill a new semantic category, as in Yiddish *mitkind* created to represent the English concept 'sibling'. Finally, complex units can include the hybridization of a compound term where one part is analyzed and the other part is unanalyzed as in the Spanish phrase *pelota de fly* for English 'fly ball'. This hybridization can happen at the word level or in the stem or affix of a word (Weinreich
1953: 50-52).

HYBRIDS are a specialized form where part of the word is transferred and also reproduced as can be seen in the Italian word canabuldogga for ‘bulldog’ where ’dog’ is both transferred and reproduced (Weinreich 1953: 47-52)

1.2 Defining Borrowing: Importation and Substitution
Weinreich's contemporary, Einar Haugen, focused on borrowing as a process rather than a product and introduced the terms IMPORTATION, the use of a foreign structure in the native language, and SUBSTITUTION, the replacement of a foreign feature or pattern by a native 'equivalent' (Haugen 1950). Haugen also introduced an important differentiation between borrowing, or the transference of a pattern from one language into another, and loans, which are the ‘tags which various writers have applied to various results of borrowing’ (Haugen 1950: 213) and outlines four major loan categories: loanwords, loanblends, loanshifts, and creations.

Haugen limits LOANWORDS to the importation of non-native words and morphemes that include both the meaning and phonemic shape of the original as in the American English word 'shivaree' from the French charivari, an uninvited serenade of newlyweds (Haugen 1950: 213).

LOANBLENDs, or HYBRIDS, include morphemic substitution and importation as in the Pennsylvania German word [Blaumapal] from the American English 'plum pie'. Included in loanblends are BLENDED STEMS as in American Norwegian kārrna for American English 'corner' (from Norwegian hyrrna - corner) and BLENDED DERIVITIVES as in Pennsylvania German ‘-ig’ which replaces the American English ‘-y’ in bassig for 'bossy' (Haugen 1950: 219).
LOANSHIFTS bypass morphemic importation and utilize only morphemic substitution. This category includes LOAN TRANSLATIONS (or calques), which are compound terms of two native constituents to represent a foreign structure pattern and SEMANTIC LOANS, which use an existing (and often phonologically related) word to include a new meaning. A semantic loan is considered a LOAN HOMONYM when it creates two unrelated meanings for one word as in groseria in American Portuguese, which, apart from its original meaning of 'a rude remark', has also come to adapt the English meaning of 'grocery store' (Haugen 1950: 219). When there is some semantic overlap a LOAN SYNONYM is created as in the American Portuguese use of peso to mean peso (a Latin American unit of currency) and to mean 'dollar' (SEMANTIC DISPLACEMENT) and livraria to mean 'book store' and 'library' (SEMANTIC CONFUSION) (Haugen 1950: 219).

CREATIONS include native words used in an innovative way, new concepts represented by combining foreign morphemes, or any combination of the two. An example of a purely native creation comes from Pima, a North American indigenous language, where they have used the Pima words for 'wrinkled buttocks' to represent 'elephant' HYBRID CREATIONS include adaptations like the Yaqui word lios nóoka (lit 'god-speak'/dios habla'), which combines a loan for God, Dios in Spanish, with a native word for speak to mean pray (Sp 'rezar'). Finally there are creations that use only foreign components. An example of this can be seen in Japanese when they use wan-man-ka, which literally comes from English 'one man car' to represent a bus with no conductor.\(^2\)

\(^2\) The concept of purely native creations and creations using only foreign components is actually from Winford (2003).
Table 1.1. Classification of lexical assimilation (based on Haugen 1950 & Winford 2003)

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<td><em>Kårrna</em> (AmNor) from 'hyrrna' (Nor)</td>
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<td></td>
<td><em>volkenkratzer</em> (Ger) from 'skyscraper' (Eng)</td>
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<td></td>
<td><strong>Semantic loan / Extension</strong></td>
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<td></td>
<td><em>groseria</em> (AmPort) from 'grocery' (Eng)</td>
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<td><strong>Loan synonym</strong></td>
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<td><em>peso</em> (AmPort) for 'dollar' and 'peso'</td>
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<td><strong>Semantic displacement</strong></td>
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<td><em>livraria</em> (AmPort) for 'bookstore' &amp; 'library'</td>
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<td></td>
<td><strong>Semantic confusion</strong></td>
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<td><strong>Creations</strong></td>
<td><strong>Example</strong></td>
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<tr>
<td>Purely native creation</td>
<td><em>'wrinkled buttocks'</em> (Pima) for 'elephant' (Eng)</td>
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<tr>
<td>Hybrid creations</td>
<td><em>lions nöoka</em> (lit 'god-speak'/dios habla' in Yaqui) for 'pray' (Eng)</td>
</tr>
<tr>
<td>Using only foreign components</td>
<td><em>wan-man-ka</em> for 'bus with no conductor' (Jap) from 'one-man-car' (Eng)</td>
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While recognizing the important role of calquing and native creations, this dissertation focuses on lexical borrowing in a more strict sense. That is, the data from this
study includes foreign lexical items that have been adapted to fit the native phonological structure at some level. This means that each loanword is only a part of the whole picture and has essentially ‘won out’ over various other strategies and may even exist alongside a native form. The original Triqui word for radio, for example, is /aga?3 atšaa5/ or ‘singing metal.’ This term is still used today however it has also come to have a hybrid form, /aga?3 radyo4/, as well as the simple loan, /radio4/. In fact, different forms are often used by the same speaker and may be coming to have slightly different meanings.

1.3 Language Contact: Structural Constraints, Mechanisms of Transfer, and Sociolinguistic Considerations
The manner in which a lexical item is imported often depends on typological similarities, frequency of use, and levels of bilingualism. In many cases a lexical item is taken as a whole or, especially in the case of verbs, one form is chosen and is then nativized with recipient language (RL) morphemes and phonemes. This next section takes a more detailed look at lexical borrowing as part of a larger process taking into account how these different structural constraints, transfer mechanisms, and sociolinguistic considerations play a role in lexical borrowing.

1.3.1 Structural Considerations: Scale of Borrowability
It is generally true that nouns are the most borrowed category. There are various theories that look at why nouns are so often borrowed over other grammatical categories and how grammatical function influences borrowability overall. Haugen was one of the first to create what he called a SCALE OF ADOPTABILITY (Haugen 1950) based on a comparison of his findings on American Norwegian with the findings from two other sources. From this scale he makes some conclusions about the relative borrowability of certain grammatical categories. His results can be found in Table 1.2 below.
Haugen attributes the frequency with which nouns and verbs are imported to the fact that vocabulary, which is continually acquired long after adulthood and least bound to the grammar, is most likely to be borrowed. Conversely, items that are acquired earlier, such as basic grammar and phonology, are the least likely to be transferred. He also believed that structural features are borrowed very infrequently, or at least only in more extreme of cases of bilingualism and language contact. While age of acquisition is a valid consideration in borrowing, Haugen’s finding that nouns are overwhelmingly the most borrowed category could also be due in part to the fact that nouns and verbs are the most frequently used category in general.

Muysken (1999) also creates a hierarchy of borrowability and, like Haugen, he places nouns, verbs, and adjectives as the most borrowable categories although in a slightly different order: 'nouns - adjectives - verbs - prepositions - coordinating conjunctions - quantifiers - determiners - free pronouns - clitic pronouns - subordinating conjunctions' (Muysken 1999: 231).

Muysken focuses his analysis on the semantic and pragmatic role of the word in the sentence rather than order of acquisition and introduces the terms syntagmatic and
paradigmatic coherence. In syntagmatic coherence, he flags **CONTENT WORDS** (nouns, verbs, and adjectives) as more easily borrowable (less universally marked) than **FUNCTION WORDS** (articles, pronouns, and conjunctions). In paradigmatic coherence, which describes the overall tightness of a subcategory, pronomial systems, determiners, and other paradigmatically organized words are less likely to be borrowed (more universally marked) than less organized ones. In addition, noncore vocabulary and words that play a peripheral role in sentence grammar (interjections, some types of adverbs, discourse markers, and even sentence coordination markers) are borrowed more easily, and words that are more crucial to the organization of a sentence are harder to borrow.

Up to this point, we have seen hierarchies of borrowability based on detailed and even contradictory categories. Van Coetsem (2000) steps away from overly detailed hierarchies of borrowability by creating a continuum that is based on a **primary partitioning of language** (112), which divides language into three general categories: vocabulary (V), grammar/morphosyntax (G), and phonology (PH). In his **secondary partitioning of language** into (V) and (G)-(PH) the more structural elements (G)-(PH) are considered to be more stable and therefore less transferable and purely lexical elements (V) are less stable and therefore most easily transferable. To take this division a step further he divides (V) into closed and open lists as well as secondary (specialized) and primary (basic) vocabulary, which bring them closer or farther away from (G) and influence their overall transferability. The following continuum shows Van Coetsem's 'scale' of borrowability: V vs G,PH → 'secondary vocabulary' vs 'functors, primary vocabulary, grammar and phonology' (Van Coetsem 2000).

All three attempts to categorize borrowability are problematic in their own way.
Haugen and Muysken are too narrow in their attempts to define the borrowability by lexical category and leave little room for typological differences between languages. Van Coetsem’s view of borrowability does, however, allow for different languages to arrange themselves in slightly different orders; nevertheless, it also oversimplifies the process by failing to sufficiently define what is meant by primary vocabulary, secondary vocabulary, and especially ‘functors’.

One possible answer to support the findings above lies in code-switching research. Myers-Scotton and Jake (2000), using data from code-switching, aphasia, and second language research, have created a 4-M model to differentiate between four different types of morphemes: one content morpheme and three system morphemes (Myers-Scotton & Jake 2000). Rather than focus on open and closed categories or lexical categories, this theory focuses on thematic roles of morphemes and when they are activated. For example, in the sentence, “the dog ate the toy up”, ‘dog’ and ‘ate’ would both be content morphemes, ‘the’ and ‘up’ would both be considered early system morphemes as they directly link semantically/pragmatically to the content morphemes of the sentence. Examples of late system morphemes, then, would be prepositions like ‘of’ in its traditional role of bridging content morphemes and things like possessive markers and case markers would then be considered and ‘outside’ system morpheme. In their view, verbs are prototypical content morphemes that assign thematic roles and nouns are prototypical receivers of thematic roles. Adjectives would also be considered content morphemes when they assign thematic roles as predicate adjectives (Myers-Scotton & Jake 2000).

This division helps to explain why nouns and verbs are the most borrowed
categories followed by adjectives. It also helps to solve the problem of language-specific typological differences as a system morpheme in one language could be a content morpheme in another. For example, Triqui has systematically borrowed one Spanish item as a preposition in their language, ‘cuento’. This could be a fluke with no explanation or it could be that in Triqui, this construction is activated at the conceptual level while in Spanish it is not. Finally, there is also evidence that verbs, despite their highly structured grammatical forms, are also borrowed as ‘non-verb’ lemmas and only become verbs in the recipient language when native tags and morphemes are added (Wichmann 2004).

To sum up, in this dissertation, borrowing is the incorporation of foreign lexical items into a recipient language. Borrowed items have traditionally been thought to enter a language as lemmas devoid of morphological and phonological information. Content morphemes, especially nouns, are the most easily transferrable lexical items and are the most likely to be borrowed since little morphological information needs to be stripped out. System morphemes are unlikely to be borrowed without the presence of intense bilingualism and contact. Finally, closed systems such as grammar and phonetic inventories are most resistant to borrowing.

1.3.2 Mechanisms of Transfer: Imposition and Borrowing
The transference of features from one language to another is also affected by the context of the contact situation and the mechanism by which this feature is transferred. There have been various theories that account for these two factors. One notable study outlines the relationship between types of borrowing and intensity of contact in a lexical-structural

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3 This is based on a verb database of loan verbs in over 60 languages constructed by Wichmann and Wohlgemuth (Wohlgemuth 2005a, 2005b).
continuum of borrowing (Thomason & Kaufman 1988). This continuum gives a broader picture of how both lexical and structural borrowing happen depending on the intensity of contact and cultural pressures at work as seen in example 1 below.

Table 1.3. Lexical-structural continuum of borrowing (adapted from Thomason & Kaufman 1988)

1. **Casual Borrowing: Lexical Borrowing Only**
   - **Lexicon**: nonbasic vocabulary is borrowed before basic

2. **Slightly More Intense Contact: Slight Structural Borrowing**
   - **Lexicon**: function words and various adverbial particles
   - **Structure**: phonological borrowings are restricted to loanwords and syntactic features borrowed cause little or no typological disruption.

3. **More Intense Contact: Slightly More Structural Borrowing**
   - **Lexicon**: function words and derivational affixes, inflection affixes (attached to and confined to foreign lexical items). Pronouns and lower numerals can also be borrowed at this point.
   - **Structure**: phonemization can replace allophonic alternations. Prosody and syllable structure can also be borrowed, some minor changes in word order can be found.

4. **Strong Cultural Pressure: Moderate Structural Borrowing**
   - **Structure**: major structural features that cause little typological change. New phonological contrasts/loss of phonological contrasts, new allophonic and morphophonemic rules, and more extensive syntactic morphological changes (affixes, categories such as cases) take place.

5. **Very Strong Cultural Pressure: Heavy Structural Borrowing**
   - **Structure**: Major typological changes that cause typological disruption, loss of phonemic contrasts and morphophonemic and syntactic rules (eg developing toward agglutinative morphology), categorical as well as more extensive ordering changes in morphosyntax (e.g. developing ergative morphosyntax).

While organizing the lexical and structural borrowing by the type and intensity of contact seems intuitive, it is hard to quantify how much cultural pressure should be considered ‘strong’ or ‘very strong’. In addition, languages in contact often show signs of various levels of structural and lexical borrowing at the same time.

Other studies attempt to address this issue by dividing contact-induced language
change into two transfer mechanisms: borrowing and interference (Thomason & Kaufman 1988; Van Coetsem 1988, 2000; Winford 2007). Although the various sources do not all use the same terminology, it is generally accepted that contact induced change assumes a donor or source language (SL) and recipient language and that the direction of transfer is from SL to RL. The difference between the two transfer mechanisms lies in whether or not the agents of change are linguistically dominant in the SL or RL. Social or political dominance of a language, while playing an overall role, does not make much of a difference in the case of transfer mechanisms.

In interference—also called transfer, interference via shift, substratum interference, imposition, and substratum influence—speakers are dominant in the source or donor language (SL) as in the case of second language acquisition. The changes in this type of contact are traditionally restricted to the phonology, syntax, and sometimes morphology of the recipient language. When this type of transfer takes place in only a few speakers (as in formal 'classroom' acquisition and small scale immigration) there is no effect on the SL at large, however, when it happens to a significant sized (or prominent) bilingual community there is often substrate evidence in the local variety of the SL. This is evidenced by contact-based innovations in the Spanish of many Quechua-speaking areas (Klee 1996; Escobar 2005; Calvo Perez 2000), and Guaraní-speaking

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4 Appel and Muysken (1987) describe five ways in which grammatical borrowing could potentially take place (154-158)

1. Through convergence due to prolonged existence
2. Through cultural convergence ad lexical borrowing
3. Through massive relexification
4. Language acquisition and substrate
5. Imitation of prestige language patterns
areas (Palacios Alcaine 2000) of South America where this substratum influence is seen even in the speech of monolingual Spanish speakers.

In the second transfer type of borrowing, speakers who are dominant in the RL incorporate SL features into the native language. This incorporation often involves little or no bilingualism and, as opposed to substratum influence, primarily includes lexical items imported as stems. This can be seen in the importation and adaptation of many Nahuatl words such as ‘tomato’ and ‘chocolate’ into Spanish, as well as by Spanish-origin words into indigenous languages of Latin America. Unless certain sociolinguistic factors come into play, these terms are traditionally imported disregarding SL morphological inflection and are adapted, or modified phonetically, to fit the rules of the recipient language. Over time these lexical items become highly adapted to the native phonology and often cease to be recognized as foreign.

Often the two mechanisms can be related and even confused. Take for example, the use of the same unaspirated Hindi phonemes /p, t, k/ in both Hindi loanwords from English (RL agentivity) and in the Hindi variety of English (SL agentivity). Hindi speakers replace aspirated stops /ph, th, kh/ with their unaspirated counterparts in both cases (imposition and borrowing) showing how different agents of change can sometimes result in a similar outcome (summarized in Winford 2007: 11). We can see a similar situation in Triqui where nasals followed by voiced and voiceless stops are in free variation with each other (B. Hollenbach, July 2009, personal communication). In the phonological adaptation of the word lentes 'glasses', bilingual Triquis will adapt it as ________________

5 For a more detailed study on lexical adaptations of many terms into American indigenous languages see Brown (1999).
either /lende⁴/ or /lente⁴/ when they are speaking Triqui (RL agentivity) as well as in Spanish (SL agentivity). This leads to convergence of some forms while speaking Triqui (RL agentivity) since lende⁴ is also a more established loanword for the Spanish word ‘suplente’ (substitute or vice-official in government). Additionally this lack of differentiation, and possible confusion, can be seen in the Spanish of many speakers dominant in Triqui (SL agentivity) when they pronounce ‘cuanto’ (how much) and ‘cuando’ (when) using Triqui phonetic rules.

The two examples above describe cases where one language is clearly linguistically dominant, but what happens in instances where long periods of bilingualism and intense language contact have blurred the distinction? Winford (2007) shows how borrowing, which primarily affects the lexical domain and is often sporadic, and 'imposition', which is primarily structural and systematic, work together in some 'fuzzier' contact situations. Some examples, even extreme ones, are caused by only one of the transfer mechanisms. Media Lengua, which has incorporated Spanish vocabulary into Quechua syntax can be considered an extreme case of lexical borrowing without imposition. On the other side, the lack of a common RL in creole language formation would then need to be considered an extreme case of imposition.

It is more often the case, however, that these two mechanisms are present at the same time. In some cases they are in free variation, as in the case of code-switching by Japanese-English balanced bilinguals in Toronto and San Francisco (Nishimura 1986). The two can also work in different ways within the same contact situation as is the case with Ritharngu and Ngandi of Northern Australia where intermarriage between the two language groups has created a state of perpetual unbalanced bilingualism that encourages
interaction between RL and SL agentivity. The attempts of the new wives to use a new language can be considered the source of many structural innovations (SL agentivity) and bilingualism created by the children of these mixed marriages and festivals held together have created the opportunity for many of these structural changes to get passed on to subsequent generations and lexical items to be passed between languages (RL agentivity). In fact, in some domains these genetically very different languages share as much as 65% of core and peripheral vocabulary (Winford 2007). In other cases, imposition plays a stronger role than borrowing. This is the case with Capadocian Greek, which has been influenced by Turkish at all levels: lexicon, morphology, syntax, and phonology. Winford argues that these changes must have resulted from a significant population becoming dominant in Turkish as men spent time working in Turkish-dominant centers and children started to use Turkish more in the home, and not from massive structural borrowing.

A third possibility is that these two mechanisms happen in succession as is believed to be the case in Anglo Romani, which is primarily English in structure and lexically Romani. Instead of attributing this to massive structural borrowing (without lexical borrowing) caused by gradual borrowing of structural features (Thomason & Kaufman 1988) many now believe that this language shifted to English at some point and then later borrowed lexical items from Romani after this initial shift had already occurred.

Although examples of structural borrowing are documented in Triqui—(Hollenbach 1977b) is one example—this dissertation will focus on lexical borrowing motivated by RL agentivity. More specifically, it will concentrate on the adaptations of lexical items, including nouns, verbs and adjectives and the structural and sociolinguistic
factors that influence this process.

1.3.3 Sociolinguistic Considerations
Thomason and Kauffman (1988) state that ‘[s]ociolinguistic history of the speakers, and not the structure of their language, is the primary determinant of the linguistic outcome of language contact’ (35). Brown (1999) makes a similar statement in his comparison of lexical borrowing between American Indian languages influenced by Spanish and American Indian languages influenced by English.

Amerindian languages of Latin America (influenced mostly by Spanish speakers) have been considerably more inclined to adopt Spanish loans for items of acculturation than native languages of Anglo-America (influenced mostly by English Speakers) have been inclined to adopt English loans. This is explained by regional differences in bilingualism [...] However, some evidence suggests that language structure does occasionally influence borrowing, although only minimally. (Brown 1999: 158)

Although factors such as orthographic influence have also been shown to play a minor role in borrowing (Paradis & LaCharité 1997), it is generally accepted that a significant group of bilingual speakers need to be present for borrowing to occur and become widespread in a community (Weinreich 1953; Haugen 1950; Poplack et al. 1988; Paradis & LaCharité 1997). Additionally, the phonological integration and adaptation of lexical borrowings depends primarily on bilingual ability and is further influenced by a specific lexical item’s age of attestation and frequency of use. Rates and types of bilingualism are important to the analysis of loanword adaptation in two ways. First,
bilingualism leads to related contact phenomena such as code-switching and nonce-borrowings (Haugen 1950). Second, an increase in levels of bilingualism in the community has been shown to decrease levels of substitution in both established and newer lexical borrowings (Brown 1999 & Paradis & LaCharité 1997). This means that the same loanword or phonological pattern may have two or more realizations depending on various factors such as when it was adapted, its frequency of use, other phonological changes happening within the language, and levels of bilingualism present at the moment of importation. The Spanish word tiempo or ‘time’, for example, has been borrowed twice in Triqui. Originally it was borrowed as dyo⁴ to represent the wet and dry seasons; more recently, it was adopted as dyembo⁴ to represent length of time.

This next section focuses on how the literature addresses the following questions:

- How do we explain multiple forms of the same borrowing often exist in a language?
- How do generational differences and shifts in bilingualism influence the adaptation of newer and established loanwords?
- How do we differentiate between code-switches, nonce-borrowings and established loanwords?

**Timelines of Adaptation**

Dictionaries have long been the primary source of analysis in research on loanword adaptation. While they are often a very reliable source of attested loanwords, they are also problematic in that they only show a snapshot of a language contact situation. Imported words are known to be less stable and therefore are more susceptible to change over the course of generations, as the word becomes more commonplace, or as levels of bilingualism and intensity of contact in a community change over time. In languages with no official written form, this becomes even more problematic, and often the loanwords
that are written by fieldworkers are no longer in use or are dramatically different in a relatively short period of time. In Triqui, for example, many concepts that were originally expressed through a calque or a loan with a Triqui native marker are referred to by a minimally altered Spanish loanword today. The word for bicycle is a primary example of this. When bicycles were first introduced to the Triquis over 50 years ago there was little bilingualism and they used a primary accommodation (as defined by Casagrande 1955) to represent this new concept. The Triqui word for metal, /agaʔ3/ was combined with the loanword /wayo4/ ('horse', from 'caballo' Sp) to form /agaʔ3 wayo4/ (lit 'metal horse'). As the bicycle became more commonplace and the rate of bilingualism grew, secondary accommodations came into use; at first with high levels of phonetic adaptation as in /agaʔ3 skleta4/ or /biskleta4/, and later with very little adaptation as in /bisikleta4/.

Haugen connects these different types of adaptation to three periods of bilingualism in a community: 1. a prebilingual period characterized by a relatively small group of bilinguals with almost complete native substitution of loanwords and great phonetic irregularity; 2. a period of adult bilingualism characterized by a growing familiarity with the donor language and a PHONEMIC REDISTRIBUTION of native sounds to accommodate foreign segments; and 3. a period of childhood bilingualism characterized by intimate familiarity with the donor language and PHONEMIC IMPORTATION of foreign sounds (Haugen 1950: 216-217). This generational divide was exemplified in fieldwork done by the author with Triqui immigrants in western Mexico. When asked what the word for chocolate was they would all give me the fully adapted word /ʃokolate4/. The youngest generation knew no other way to say that word; however, the middle generation recognized the word /ʃlate4/ (referring to it as what some say in Oaxaca). And only the
oldest generation recognized the native word /ni³ke¹/ or /na³ke¹/.

Brown (1999) looks at the evolution of some adapted lexical items as they evolve without specifying specific periods of bilingualism. According to Brown the age of a borrowing increases the salience of it, which in turn influences how it evolves.

When first encountered, an introduced object is always low in salience and a native term for a similar item is directly extended to it creating polysemy. As the introduced item becomes more familiar and increases in salience, polysemy breaks down and the item develops an overt marking construction—the word for the indigenous item plus a modifier (overt mark). If the introduced referent eventually surpasses the native referent in salience, a marking reversal develops in which the original term comes to designate (without a modifier) the introduced item and the native object acquires an overt marking construction. (Brown 1999: 159)

In sum, variation in loanword adaptation can happen over the course of generations, through varying levels of bilingualism, or naturally as part of the adaptation process. This variation can tell a great deal about the nature of adaptation, levels of bilingualism, and the degree of language contact. It is also the mechanism by which foreign sounds are believed to enter a language.

Distinguishing Terminology: Code-switching, Nonce-Borrowing and Established Loans

Not only can variation in loanwords be seen over time, there is also variation in the way many of these lexical items are used by the same community or even the same speaker. When a monolingual speaker uses lexical items from another language it is safe to assume that he or she is using a fully assimilated loanword. Conversely, when lexical items are
inserted into the discourse of a bilingual speaker it becomes more challenging to
determine whether this insertion of L2 material is representative of a code-switch or some
other form of lexical borrowing (loanword of nonce-borrowing). Traditionally loanwords
are considered to be completely adapted to the RL while code-switches are items that are
nonintegrated at the syntactic, lexical, and phonetic levels. However, in practice it is often
difficult to differentiate between the different processes, especially in the case of lone
lexical items. Poplack and Sankoff (1984) define lexical borrowing as a general process
by which foreign lexical elements come to be used in a RL, which can be divided into
(establish/attested) loanwords and nonce borrowings. According to Poplack and Sankoff,
[t]he status of 'loanword', [...] is traditionally conferred only on words
which, in addition, recur relatively frequently, are widely used in the
speech community, and have achieved a certain level of recognition or
acceptance, if not normative approval. (Poplack & Sankoff 1984: 52,
emphasis mine)
NONCE-BORROWINGS, also called on-line adaptations (Paradis & LaCharité 1997), are the
instantaneous and often, although not always, less adapted introduction of a foreign
element that may or may not get used again, even by the same speaker (Haugen 1950;
Poplack & Sankoff 1984). Often studies on adaptation of lexical borrowings have focused
primarily on attested loanwords (generally through dictionaries and written materials);
however, a closer look at the relationship between code-switches, loanwords, and nonce-
borrowings has implications for the method for the collection and analysis of loanword
adaptations in this study.

These three phenomena—code-switching, nonce-borrowing, and loanwords—
form a sort of continuum. The difference between loanwords and code-switches is easily determinable; nonce-borrowings, however, have been problematic.

Code-switching ----------- nonce-borrowing ----------- established loanword

Loanwords, as defined by Haugen and Poplack & Sankoff, are imported and adapted fully into the grammar of the RL. Over time, many criteria have been used to define established loanwords including: whether or not it has replaced an earlier synonymous word, if it is used to represent a concept that was once new but is now commonplace, age of attestation, degree of phonological modification, presence in the speech of monolinguals, and judgment of native speakers as to the status of a borrowing. (Fries & Pike 1949) consider a loanword to be established when (a) it parallels the sequences occurring in native materials, (b) its occurrence in relation to grammatical boundaries is the same as sequences in native words, (c) and when the words containing it are in common use by monolinguals. Poplack and Sankoff, even while admitting to the possible misleading nature of loanword criteria, outline four characterizations of established loanwords based on frequency of use, native language synonym displacement, morphemic and/or syntactic integration, and native-speaker acceptability. However, for their study of English loans in five francophone neighborhoods of Ottawa and Quebec they considered loans to be broadly defined as words of SL origin including words that are etymologically SL without a current RL equivalent, older and more established loanwords, and RL-SL homographs (Poplack & Sankoff 1984).6

6 This view was also adopted by Paradis and La Charite (1997).
Code-switching is the use of two languages in the same conversation by bilingual speakers and often involves the insertion of one language into another ‘matrix’ language (Myers-Scotton & Jake 2000). It is differentiated by loanwords in a few ways. First, it is not adapted syntactically or phonetically and, second, code-switches are more often than not at the level of the phrase or sentence. Often code-switching is accompanied by discourse markers such as translation, metalinguistic commentary, and other flagging devices (Poplack & Sankoff 1984).

The literature clearly establishes that loanwords are fully integrated into the source language both phonetically and semantically and that code-switches are unadapted items used by bilingual individuals but the status of nonce-borrowings has been highly debated. Like code-switches, nonce-borrowings are used by bilingual individuals rather than society at large. Alternatively, these items also share common characteristics with attested loanwords; they are often fully adapted phonetically and are always one word, rather than a sentence or phrase. Poplack and Sankoff (1984) support this in their study of bilingual speech in the Ottawa-Hull region. They show how nonce-borrowings, or unattested borrowings, are as likely to be adapted phonologically into French as not—even when the word is used by the same person—and also that unattested loans used only once can be found to be completely phonetically assimilated as well. Since degree of phonetic adaptation and frequency are proving to be unreliable determiners, some have started to test a Nonce-Borrowing Hypothesis, which predicts that any SL lone lexical item that is incorporated into the RL should be considered a borrowing and not a code-switch. They have set out to prove this by studying the degree of syntactic incorporation of lone ambiguous SL elements in otherwise RL contexts and comparing/contrasting that to
unambiguous code-switches. Turpin (1998) analyzes the use of flagging, determiners, adjective placement, and marking of number in the bilingual discourse of eight Acadian French speakers. She finds that ambiguous lone English-origin nouns in French discourse pattern like nouns in unmixed French and differ from English nouns in both unmixed English and unambiguous code-switches to English. Samar and Meechan (1998), looking at the reference marking, word order, and use of specifying marker (ra) in Persian-English bilingual discourse, find virtually no difference between nonce-borrowings and established loanwords. Similar examples are also found in Igbo-English discourse (Eze 1998), Ukrainian-English discourse (Budzhak-Jones 1998), and Turkish-English 'londrali' in Cyprus (Adalar & Tagliamonte 1998). While all of these studies are limited in that they all compare this problem in languages in contact with English, they are able to corroborate this theory across contact situations involving structurally different languages.

In sum, lexical borrowing is one way in which foreign concepts are brought into a language, which is further complicated by the fact that lexical items are borrowed at different rates depending on their syntactic and semantic function, frequency of use, and typological similarities between languages in contact. Depending on levels of bilingualism, loanwords are imported as stems or lexemes devoid of SL morphological information before they are adapted phonologically, morphologically, and syntactically into the RL. In addition, nonce-borrowings, although used only by bilinguals, are just as likely to be adapted as not and are always used according to RL grammar. The next section will focus on the various theories behind phonological adaptations of these 'stems' or lexemes.
1.4 The Role of Perception and Production in Phonological Adaptations of Lexical Borrowings

It is generally agreed that speakers attempt to adapt loanwords in a way that is most faithful to the input, while at the same time producing a well-formed native output at the segmental, phonotactic, and prosodic levels. Earlier studies simply assumed that ‘speakers are completely unaware that they have changed a word’ (Haugen 1950: 215). Recent theories have placed greater importance on the mechanisms that govern adaptations and the role of phonetic perception and phonological production in this process, the degree to which similarity and saliency of features come into play, and whether the process is rules-based or constraints-based.

1.4.1 Perception Only

One approach is based solely on a perception analysis of loanword adaptation. In the perception only theory, ‘loanword adaptations are not computed by the phonological grammar of the borrowing language’ but by the phonetic perception (Peperkamp & Dupoux 2003). During this phonetic coding, a given input sound will be mapped onto the closest available phonetic category, where 'closest' is defined in terms of either acoustic proximity or proximity in the sense of fine-grained articulator gestures. Some of the reasons cited for this analysis are 1) languages will often adapt a word that does not seem to break any native phonological rules/constraints; 2) the same language will adapt similar words from two different languages differently; and 3) speakers will often perceive segments like epenthetic vowels in words with consonant clusters. This explanation assumes that phonetic decoding is determined very early in life (before the age of six) and that phonological 'deafness' is present even in relatively balanced bilinguals (Peperkamp & Dupoux 2003: 368). Two problems associated with this theory are that it has been shown that speakers often do perceive non-native segments and that it does not describe
1.4.2 Production Only
A second approach assumes that both perception and adaptation happen at the phonological level (Hyman 1970; Paradis & LaCharité 1997; Ito & Mester 1995; Jacobs & Gussenhoven 2000). In this line of thinking, loanword phonology is not a separate component of grammar. It is accounted for by the same rules and constraints of the native phonology and can even uncover latent or covert constraints in the recipient language. In this approach, the recipient language speakers are able to perceive the sounds of the source language, even ill-formed ones, and map them onto an underlying form in their language thus subjecting them to the rules (or constraints) of the receiving language (Hyman 1970).

Paradis and LaCharité (1997) believe that ‘borrowers perceive and properly handle the sounds of a source language’ (391) by using a Theory of Constraints and Repair Strategies (TCRS), which is based on the three following principles: MINIMALITY PRINCIPLE, which states that a repair must apply at the lowest phonological level and must involve as few strategies (steps) as possible; PRESERVATION PRINCIPLE, which states that segmental information is maximally preserved within the limits of the THRESHOLD PRINCIPLE, which states that all languages have a threshold of two steps/repairs in order to enforce segment preservation (Paradis & LaCharité 1997). Features that require two or more steps, or repairs, cross the tolerance threshold necessitating a feature to be added (epenthesis) or deleted in order to maintain well formedness. Ito and Mester (2001) and Jacob and Gussenhoven (2000) believe that speakers analyze foreign elements in terms of

---

7 See Hyman (1970) and Ito and Mester (2001) for more arguments against the perception-only approach.

8 See Ulrich (1997) for a critique of this method.
a universal phonological inventory and account for lexical adaptations not by the number of repairs but through the ranking of faithfulness and markedness constraints using Optimality Theory.

The production-only theory offers an interesting explanation for why loanwords do not always follow native patterns that the perception only theory does not account for. Based on Chomsky's idea of core and periphery, some of the proponents of the production-only theory position loanwords, along with onomatopoeias and proper names, in a peripheral area rather than in core vocabulary (Ito & Mester 1995; Paradis & LaCharité 1997). By doing this, these items become subject to only a subset of the languages core constraints and can therefore vary; much in the way nonce-borrowings do (Ito & Mester 1995, 2001). It is in the study of these peripheral lexical nativizations and stratal faithfulness constraints that covert generalizations within a language are uncovered. For example, the German nativization of the English word *story* involves nativization of the rhotic /ɹ/ to /ʀ/ and palatalization before occlusives sC to ʃC. If these two processes are maintained separate then there are four possible realizations of this word in German: [stoɹy], [stoʀy], [ʃtoʀy], and *[ʃtoɹy]. The fact that these various realizations are possible and that the some are disallowed, as in *[ʃtoɹy], has various implications for the theory of loanword adaptation. First, it shows how analysis of lexical nativization can uncover covert rankings that would otherwise remain latent, second, it poses a challenge to the perception only theory and thirdly, it challenges the TCRS model by showing how candidates with different numbers of repairs (from 0 to 4) are equally judged as acceptable by native informants.

1.4.3 Perception and Production as Separate Processes
Other accounts rely on perception as the primary motivator of adaptation but also include
phonological production as a separate process within the same system (Silverman 1992; Yip 1993, 1995, 2002; Kenstowicz 2007). In this approach speakers unconsciously make decisions about what features should be maintained or deleted during the process of lexical nativization based on perceptual saliency (or phonological contrastiveness). 'Surviving' features are then passed through the rules (Silverman 1992) or constraints (Yip 1993, 2002) that govern the native language to create a well formed output in the native language. Silverman (1992) uses a multiple scansion model in which foreign features pass through a Perceptual Level and an Operative Level before being incorporated into the native lexicon. In the Perceptual Level, foreign input is perceived as acoustic information devoid of phonological representation. Features that are salient enough, or contrastive, are given a native phonological representation based on this acoustic representation and are then passed through an Operational Scansion. Features below this salient threshold are dropped before reaching the Operational Level. It is at the Operational Level where lexical nativization happens. An example of this can be seen in the adaptation of the English words 'cut' and 'mark' into Cantonese (Silverman 1992). At the Perceptual level the 'r' is not perceived before a voiceless stop but the aspirated stops are. Since Cantonese includes aspirated and unaspirated stops at the operational level the syllable final aspirated stops must be deleted in order to follow the rules of Cantonese.

(1) Multiple scansion view of loanword adaptation (Silverman 1992: 300)

<table>
<thead>
<tr>
<th>a. input</th>
<th>cut</th>
<th>mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. perceptual level</td>
<td>[k'at']</td>
<td>[mak']</td>
</tr>
<tr>
<td>c. operational level</td>
<td>[k'at]</td>
<td>[mak]</td>
</tr>
</tbody>
</table>
Yip (1993) applies a constraint-based analysis to Silverman's rule-based analysis of perception and adaptation. While the Silverman's rule-based analysis requires a separate set of rules specific loanword adaptation, this OT analysis shows how phonological adaptation of loanwords can be analyzed in the same way that native phonological adaptations are. She later expands this theory to include a new FAITH constraint called MIMIC to explain how acoustic similarity, and, to a lesser extent, visual cues can determine choice in vowel adaptation (Yip 2006).

These studies prove problematic in that they assume the speakers to be monolingual with relatively no access to the SL phonology and give no way to measure saliency or differentiate universally salient features from language specific ones. They have also been criticized for recurring to loanword specific mechanisms of adaptation like MIMIC (Boersma & Hamann 2009).

### 1.4.4 Perception and Production as One Integrated Process

A recent trend in the study of phonological adaptations of loanwords points to evidence that both perception and production are important and productive in the phonological adaptation of loanwords and that the two processes are integrated rather than separate (Fleischhacker 2002). In this model, based on Steriade’s P-Map, the speaker is active in

9 Steriade (2001) uses her concept of P-map to give a mental representation of the degree of distinctiveness of different contrasts (feature, context, contour) in different contexts/positions. Using P-map, speakers are active in the process of developing an algorithm for calculating similarity indices based on observations about confusion. Some universals such as faithfulness to manner over voicing and place and preference
preserving perceptual similarity between the original and adapted form and makes the least obtrusive repairs possible. Following the reasoning of Hyman (1970), (Kang 2003) argues that word-final epenthetic vowels in Korean loanwords are explained by motivation to remain faithful to the perceived English pronunciation and not by internal phonological explanations. A similar explanation of vowel epenthesis and assignment of stress is made by Kenstowicz in his study of Fijian loanwords. He finds that Fijians make adjustments to length and rhythm to remain faithful to English stress. When epenthesis is employed, the default vowel is [i] (a high vowel with minimal saliency) or sometimes [e] (in order to avoid palatalization of [i] after [t]; Kenstowicz 2003). In a later publication on Thai Kenstowicz concludes that:

[… the adapter is cognizant of the details of phonetic realization of English phonemes and strives to reproduce them in the loan. Some of the attempts seem to be guided by auditory similarity rather that formal feature structure or shared natural classes. But it is also clear that choices made are grammatical in nature and take into account of Thai phonological structure.](Kenstowicz 2006: 946)

Adler (2006) bases her analysis of adaptation of English loanwords in Hawaiian on a combination of Best’s Perceptual Assimilation Model (PAM)\(^\text{10}\) and Steriade’s P-Map. She for segment preservation over deletion are supported by this model.

\(^{10}\) PAM posits that speakers derive articulatory information from the speech signal, and assume the perceptual primitives to be the intended gestures of the speaker. Best’s work on the perception of non-native sounds and contrasts leads her to posit that gestural information is accessible to listeners even if the actual gesture is not utilized by
finds that faithfulness to sonority and nasality are ranked higher than faithfulness to voicing or place articulation (Adler 2006); however, she also finds a tendency to delete sibilants before stops. The P-map model would argue that sibilants are more salient than stops in a consonant cluster situation and that epenthesis or deletion of the obstruent would happen first. Adler argues that the fact that these sibilants do not exist in Hawaiian increases their chance of deletion.

Boersma and Hamann (2009) take this theory a step further positing that, ‘not only can loanword adaptation be understood entirely in terms of phonological and phonetic comprehension and production mechanisms in the first language’ (1) but that this interaction between perception and production is a bidirectional process in which the same constraints (FAITH, STRUCT, and CUE) and rankings are used by the speaker and listener without recurring to loanword specific constraints. In this model, repairs at the level of perception, like those of production, are based on language specific structural restrictions and not just segmental similarity. For example, in English loanwords in Korean, the words tag and deck are often produced as [tʰæ.ki] and [tɛ.ˈkʰi]. In contrast with Kenstowicz (2003), Boersma argues that this is because Korean speakers perceive final bursts according to Korean phonology. Speakers cannot ‘hallucinate’ an epenthetic vowel and thus vowel insertion must be due to some auditory cue or series of auditory cues, in this case the bursts [ʃ] and [kʰ] are not found in coda position in Korean and therefore must be in onset position.

Based on the information presented above, the integrated perception/production model seems to improve on the models that keep production and perception separate and their native language (Adler 2006).
provides flexibility. While the perception-only theory relies on data from monolingual
speakers and the production-only theory relies on balanced bilinguals, the integrated
perception/production model takes into account the saliency of a word, whether or not it is
perceived by a monolingual or bilingual speaker. This leaves room for both ‘phonological
deafness’ and repair strategies (both unconscious and intentional) to exist within one
theory.
San Juan Copala is located in the westernmost part of Oaxaca, almost on the border with Guerrero. The region is divided into three main cities, San Martín Itunyoso, San Andrés Chicahuaxtla, and San Juan Copala. Each has its own dialect of Triqui. In addition, the Triqui region is relatively mountainous and isolated as evidenced by the winding shape of the roads coming in and out of the area.

2.1. Introduction

This section outlines the historical and social motivations for varying degrees of Triqui contact with Spanish and explores the influence of isolation and migration on bilingualism and language use in the Copala Triqui community, both in Oaxaca and beyond. It is generally agreed that a significant population of bilinguals is necessary for importation.\footnote{See Davidson (2007) for other arguments.}
and that degree and type of bilingualism (communitywide and individual) are important factors in determining what words get imported and to what degree they are adapted.

While this description of bilingualism in the Copala Triqui community shows a chronological progression of monolingualism to widespread bilingualism, it should be noted that many types of bilingualism, and even monolingualism, are found in modern Triqui communities both in Oaxaca and diaspora. This chapter finishes with a basic description of segmental and supersegmental features of Triqui in comparison with Spanish.

2.2. **The Influence of Isolation, Migration, and Diaspora on Triqui Bilingualism**

Triqui, also referred to as Trique and sometimes written as Triki or Trike, is spoken in the westernmost part of Oaxaca on the border with Guerrero. Although the name Triqui has been attributed to the Triqui words ‘dri’ meaning God or ‘dre’ meaning father, and ‘ki’ meaning grand or superior (Huerta Ríos 1981); it is just as likely that this name was given to them by the Spanish settlers when they first came into contact with this native population. The Triquis refer to themselves as ‘the people of the town’ and to their language as /ʃnaʔah̓ nuʔ/ or ‘complete language’. Triqui is believed to have separated from Mixtec approximately 3,500 years ago and the Triquis have lived in their present location since before the Spanish colonization (Hollenbach 1999). There are three separate dialects of Triqui named after their respective town centers: San Martín Itunyoso, San Andrés Chicahuaxtla, and San Juan Copala. This dissertation will focus on the Copala dialect; as such the word 'Triqui’ will be used to refer to Copala Triqui. The other dialects will be referred to as Chicahuaxtla Triqui and Itunyoso Triqui respectively.

Due to the dispersal of Triquis throughout Mexico, the United States, and Canada
and the geographic isolation of the mountainous Triqui native land in Oaxaca, it is nearly impossible to get an accurate population count. The Mexican national census of 1970 records a population of 6,595 Triquis, 11,312 including Chicahuaxtla and Itunyoso Triquis (Cordero Avendaño de Durand 1995: 31) but this is considered to be 10% too low (García Alcaráz 1997). Table 2.1 below shows how challenging it has been to keep demographic data in the Triqui region, especially in the case of San Juan Copala, due to their political unrest and distrust of the Mexican government. The population of the San Juan Copala region was not counted until the late eighteenth century and even after the census came to the region, population counts seem to be unpredictable.

Table 2.1. Demographic history of the Triqui region

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</thead>
<tbody>
<tr>
<td>San Andrés</td>
<td>776</td>
<td>509</td>
<td>582</td>
<td>776</td>
<td>1123</td>
<td>1041</td>
<td>784</td>
<td>2129</td>
<td>1524</td>
<td>1593</td>
<td>1179</td>
<td>2230</td>
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<tr>
<td>Chicahuaxtla</td>
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<tr>
<td>Santo Domingo</td>
<td>402</td>
<td>260</td>
<td>387</td>
<td>403</td>
<td>401</td>
<td>515</td>
<td>402</td>
<td>--</td>
<td>587</td>
<td>769</td>
<td>653</td>
<td>686</td>
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<tr>
<td>del Estado</td>
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<tr>
<td>San Martín</td>
<td>725</td>
<td>212</td>
<td>198</td>
<td>725</td>
<td>812</td>
<td>524</td>
<td>452</td>
<td>973</td>
<td>665</td>
<td>804</td>
<td>761</td>
<td>1039</td>
</tr>
<tr>
<td>Itunyoso</td>
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<td></td>
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</tr>
<tr>
<td>San José</td>
<td>272</td>
<td>117</td>
<td>171</td>
<td>272</td>
<td>320</td>
<td>289</td>
<td>394</td>
<td>--</td>
<td>372</td>
<td>389</td>
<td>555</td>
<td>613</td>
</tr>
<tr>
<td>Xochixtlán</td>
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<td></td>
</tr>
<tr>
<td>Copala</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>893</td>
<td>1030</td>
<td>1265</td>
<td>842</td>
<td>986</td>
<td>3795</td>
<td>926</td>
<td>1954</td>
<td>5423</td>
</tr>
</tbody>
</table>

Source: Huerta Ríos 1981: 26

In 1990 the census estimated the Triqui population to be 15,000 and the 2005 census done by INEGI (Instituto Nacional de Estadística y Geografía 'National Institute for Statistics and Geography') puts their population at 12,266\(^{12}\) although some estimate that the present day population, including Triquis in migration, may be as high as 30,000–

\(^{12}\) This estimate does not include 20 communities, found in http://www.triquicopala.com/datos.htm (accessed March 3, 2009)
2.2.1. Triqui Isolation and Early Contact with Mixtecs

The location of San Juan Copala in extremely isolated mountainous terrain has been an important factor in their language development as it has kept them isolated from Spanish speakers. Their relationship with neighboring Mixtecs has also been important.

De esta manera, los españoles se apoderaron de las mejores tierras de los valles y de las vegas de los ríos, y desdeñaron las tierras mas montañosas y menos productivas. Por ello no se establecieron entre los triquis, pero si en Tlaxiaco, Putla y Juxtlahuaca, pueblos mixtecos que circundaban la región de aquellos. (Huerta Ríos 1981: 37)

*In this way, the Spaniards took over the best valleys and fertile lands around the rivers and scorned the most mountainous and least productive lands. For that reason they did not establish themselves amongst the Triquis, but they did so in Tlaxiaco, Putla and Juxtlahuaca, Mixtec villages the surrounded the Triqui region.* (my translation)

Lack of competency in Spanish, or at very most instrumental bilingualism, during colonial times meant that many early Spanish concepts and artifacts were brought in primarily through native creations and calques. The earliest Spanish loanwords are highly adapted and, in most cases, are no longer recognized as foreign by the native speaker. It is possible that they entered Triqui indirectly through their Mixtec neighbors who lived in the larger cities that surround the Triqui region and had much more intense contact with Spanish. During precolonial times, Mixtec was used as a lingua franca to carry out government,
religious, and commercial activities (Huerta Ríos 1981: 30)\textsuperscript{14} and many Triquis were bilingual in Triqui and Mixtec. Remnants of this bilingualism can be seen in some traditional prayers in Triqui. In fact, the idea that many of the earliest loans may have entered through Mixtec can be supported by the fact that some of the most adapted Spanish loanwords deal with government positions (see example 2), religious terms (see example 3), and some outside goods (see example 4) traditionally sold by Mixtecs in the local markets such as cotton, needles, colorful necklaces, lime powder, and fruit (Comas 1953).\textsuperscript{15}

(2) Early loans: government positions (Sources: Hollenbach 1973, 2005a)

<table>
<thead>
<tr>
<th>Spanish</th>
<th>English</th>
<th>Holl1973</th>
<th>Holl2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. agente principal</td>
<td>president</td>
<td>/zinde⁴/</td>
<td>/sinde⁴/ /snde⁴/</td>
</tr>
<tr>
<td>b. agente municipal</td>
<td>municipal agent</td>
<td>/lende⁴/</td>
<td>/kinte⁴/ /sinte⁴/</td>
</tr>
<tr>
<td>c. suplente</td>
<td>substitute</td>
<td>/zilende⁴/ /lende⁴/</td>
<td>/lente⁴/ /silende⁴/</td>
</tr>
<tr>
<td>d. capitan</td>
<td>captain</td>
<td>/wita:⁴/</td>
<td>/vita:⁴/</td>
</tr>
</tbody>
</table>

\textsuperscript{14} The Catholic Church had a presence in the Triqui region as early as the early-to-mid sixteenth century although it did not have a very active role. In fact, one of the first written records mentioning the Triquis detailed the visit of Fray Benito Fernández to the Chicahuaxtla region around 1546 to investigate reports of idolatry shows that a church was already present but inactive in the area at the time of his visit (Huerta Ríos 1981).
(3) Early loans: religious terms (Sources: Hollenbach 1973, 2005a)

<table>
<thead>
<tr>
<th>Spanish</th>
<th>English</th>
<th>Holl1973</th>
<th>Holl2005a</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. cruz</td>
<td>cross</td>
<td>/ru³se¹/</td>
<td>/ru³tze¹/</td>
</tr>
<tr>
<td></td>
<td></td>
<td>/ru³tze¹/</td>
<td>/ru³tze¹/</td>
</tr>
<tr>
<td>b. compadre</td>
<td>godfather</td>
<td>/bah⁵/</td>
<td>/bah⁵/</td>
</tr>
<tr>
<td>c. sacramento</td>
<td>sacrament</td>
<td>/rumendo⁹/</td>
<td></td>
</tr>
<tr>
<td>d. sacristán</td>
<td>sacristan</td>
<td></td>
<td>/ʃta⁴/</td>
</tr>
<tr>
<td>e. obispo</td>
<td>bishop</td>
<td>/biziko⁴/</td>
<td>/wiziko⁴/</td>
</tr>
<tr>
<td>f. iglesia/nave</td>
<td>church</td>
<td>/nuvi:⁴/</td>
<td>/nuvi:⁴/</td>
</tr>
</tbody>
</table>

(4) Early loans: goods sold in markets

<table>
<thead>
<tr>
<th>Spanish</th>
<th>English</th>
<th>Holl1973</th>
<th>Holl2005a</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. aguja</td>
<td>needle</td>
<td>/guʃa⁴/</td>
<td>/kuʃa⁴/</td>
</tr>
<tr>
<td>b. aguardiente</td>
<td>aguardient</td>
<td>/rine⁴/</td>
<td>/ritte⁴/</td>
</tr>
<tr>
<td>c. arroz</td>
<td>rice</td>
<td>/aru:⁴/</td>
<td>/garu:⁴/</td>
</tr>
</tbody>
</table>

2.2.2. Economic Shifts and Emerging Patterns of Migration
The mid twentieth century brought with it economic, political, and technological changes that put the Triquis in contact with Mexican society. This increased contact led to increased levels of bilingualism.

El monolingüismo está ampliamente extendido, pero con los nuevos y
Monolingualism is widespread, but with new means of mass communication invading the towns, their inhabitants feel it necessary to learn Spanish, a language which the majority of the population speaks using a limited repertoire of phrases. Others have studied a few years in primary school and can express themselves with some degree of fluency; others have served in the army where they learned to read and write and they acquire a relative dominance of Spanish there. (my translation.

The mid-nineteenth-century introduction of bananas and coffee as cash crops brought a new source of wealth to the region, but also intensified longstanding family feuds and eventually economic and political instability, which in turn sparked the massive migrations in the mid to late twentieth century that continue to present day. This type of migration often creates a new generation of bilinguals who ‘form a potential bridgehead for the introduction of innovations’ (Kerswill 2006: 8). Increasingly, Triqui adolescents and young adults started to leave the region to work in western Mexico and Mexico City and, as these new bilinguals returned, they started to interact with a mainly monolingual
community in Oaxaca sparking shifts in the Triqui language at all levels.

Early on, the Triquis migrated to Veracruz to work in sugar plantations (Hollenbach 1999), and later, increased industrialization in farming and irrigation led to a boom in agricultural work throughout northwestern Mexico and from there the southwestern areas in the United States. This migration to agricultural centers is circular in nature typically lasting for months and, more recently, years at a time.

For others, the urbanization of Mexico City and Oaxaca City led to a different type of migration as Triqui migrants found new work as security guards and making and selling artisan goods and textiles in the markets there. This migration for the most part is not circular, and second and third generations raised in Mexico City, with access to education, have gone on to have careers outside of the traditional agricultural and artisan sectors. Increasing numbers of blue collar workers and even professionals working as lawyers, teachers, and similar white collar jobs indicate a change in Triqui expectations, as those who migrate to cities fall in line with traditional three-generation migration patterns and language loss. Although many families have a family member in Mexico City, the migrants do not return and so have less influence in the use of language in Oaxaca and often results in the traditional three-generation assimilation and with it an eventual loss of Triqui.

For those who did not migrate, changes within the Triqui region also affected the use of, or at least attitudes toward Spanish. Improved infrastructure, the arrival of more organized schools, and increased exposure to different forms of technology, especially radio, in the second half of the twentieth century meant that the Triquis were exposed to Spanish as well as many new concepts related to this exposure.
The increases in bilingualism created by seasonal migration coupled with improved access to Spanish within the community triggered significant changes in the Triqui language. As the bilingual migrants returned to live in a mostly monolingual community they brought with them new concepts and terminology, which sparked changes in the Triqui language at almost every level. Loanwords in new semantic categories were brought in, especially relating to agricultural practice, technology, and education. The negotiation between more adapted forms used by monolinguals and less adapted forms used by bilinguals created competition between various forms. In the syntactic front there is an increase in the number of categories including verbs, adjectives, adverbs, and prepositions brought in. There is also evidence of variation in Triqui syntactic structure, an example of which can be seen in a reversal in temporal metaphors (Hollenbach 1977b). Finally, restructuring of Triqui phonemes to accommodate Spanish consonant groups16 and phonetic structure can be seen at this point, an example of this is the laryngeal /h/, which went from a more restricted use—only word finally as supersegmental feature—to use in syllable onsets (Hollenbach 1984).

2.2.3. Political Violence and the Start of Diaspora
Of the changes that happened in the twentieth century, one of the most influential is the increased internal political violence of the latter half of the century.

El incremento de cultivos de café trajo consigo la introducción de la propiedad privada al lado de la comunal y ciertos cambios en la anterior organización social de la región baja (Copala) y, en consecuencia, la proliferación de conflictos que la comunidad no pudo controlar. (García Alcaráz 1997)

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16 A list of native consonant groups can be found in (Hollenbach & Hollenbach 1975).
The increased cultivation of coffee brought with it the introduction of the private property along side of communal property and certain changes to the previous social organization in the lower region (Copala) and, consequently, the proliferation of conflicts that the community could not control. (my translation)

The economic and political strife caused by the increased importance of coffee became politically organized in the late twentieth century. In 1971 an organization called El Club (The Club) was formed with the idea of democratic election of authorities, documentation of communal Triqui territories, and the formation of coffee and banana cooperatives (Bárcenas 1986). What followed was a decade of increased assassinations of political leaders in the Triqui community that eventually put an end to El Club. On November 9, 1981, a new organization was created out of the ashes of El Club called Movimiento de Unificación y Lucha Triqui (Unification and Triqui Struggles Movement), or MULT. The goals of this organization were similar to those of El Club: to end repression of Triquis, free Triqui political prisoners, end the military party in the region, and advocate for communal land reforms (Bárcenas 1986). MULT, however, was different from El Club in that it gained the recognition of the government and aligned itself with the Mexican party Partido Revolucionario Institucional (Institutional Revolutionary Party), or PRI. Later a new organization called Unidad de Bienestar Social de la Región Triqui (Unit for the Social Welfare of the Triqui Region), or UBISORT, was created in reaction to the increasing paramilitary actions of MULT. In 2006 yet another organization called MULTI, the ‘I’ standing for Independent, was created aligning itself with the political party
Asamblea Popular de los Pueblos de Oaxaca (Popular Assembly of the Peoples of Oaxaca), or APPO. Finally, in 2007, San Juan Copala was declared an autonomous community aligning itself with MULTI and APPO. The political violence in the region has been longstanding and has even gained international recognition when two female radio announcers, aligned with APPO, were killed close to Putla on April 7, 2008, presumably by members of MULT.

As a result of these sustained migration patterns, centers of Triqui life have developed in new places such as San Quintín in Baja California, Mexico, and Greenfield in the Central Valley of California, United States. While Oaxaca is the cultural center and is considered ‘home’, Baja California and Central California are now coming to have more cohesive Triqui communities. In these areas on both sides of the border, multiple services are provided for Triquis such as medical centers with translators, legal services, and social services. In addition, translation of Mexican laws into Triqui is in progress and Triqui-led immigrant organizations such as La Union Indígena (The Indigenous Union) in California are becoming an important part of Triqui cultural life outside of Oaxaca. Triqui involvement in these organizations started out with their participation in pan-indigenous organizations such as Frente Indígena Binacional (Bi-national Indigenous Front), which was started in 1994. Eventually they branched out forming Triqui specific organizations such as La Organización del Pueblo Triqui (The Triqui People’s Organization), or OPT, and El Frente de la Lucha Triqui (The Front for the Triqui Struggle), or FLT (Velasco Ortiz 2002). A new, emerging generation of intellectuals actively promotes Triqui and indigenous rights and leads the Triqui community in different directions that are relatively free of the political turmoil that characterize life in Oaxaca.
While it is not always easy to differentiate circular migration from diaspora—both usually include an intention, or at least a desire, to return home—it is clear that the connection between Triquis in western Mexico, the United States, and Oaxaca is never truly cut. Most Triquis living in diaspora hold on tightly to their traditions, a fact that has not been without controversy. Additionally, many Triquis living in western Mexico and the United States continue to serve as traditional *mayordomos* sending money and supporting traditional festivals and community projects in Oaxaca and more recently in San Quintín, Baja California. In fact, when I visited Triqui families here in New York they were often watching videos of festivals from Oaxaca and explained to me that they or someone in their family paid for part of the festival and their family members wanted to make sure they got to see it.

The wide-scale bilingualism, characteristic of diasporic situations, has brought new trends in language use and loanword adaptation in the Triqui community. Instead of variation due to negotiation between monolinguals and bilinguals, language use is determined by complex sociolinguistic factors such as prestige, type of contact, age and circumstances of acquisition of Spanish, and geographic location. Triquis in the United States are starting to come into contact with different varieties of Spanish, especially in the northeastern United States, where Triquis are in closer contact with Caribbean varieties of Spanish as well as English. Since many Triquis do not learn much Spanish until they

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17 One recent news article titled, ‘Police: Man sold teen daughter into marriage for cash, beer, meat’ was published in CNN.com in response to the maintenance of a Triqui custom of asking a bride price (http://www.cnn.com/2009/CRIME/01/13/daughter.for.sale/ (accessed 3-4-2009)
travel outside of Oaxaca, this contact with other varieties of Spanish is especially important. It is common to hear Triquis in the northeast of the United States use traditionally Puerto Rican calques such as *llamar para atrás* for ‘call back’ instead of *devolver la llamada* and *estoy relajando*, a very Dominican way of saying ‘I am joking’.

The younger generations, especially those born outside of Oaxaca or whom left Oaxaca at a young age, use code-switching and nonce-borrowing in their speech and their Triqui is often highly influenced by Spanish. Some of the variation in loanwords used by these speakers include the elimination of rigid application of Triqui stress on the last syllable with a higher 4 tone to other syllables and a sharp increase in the use of Spanish verbs with partial Triqui inflection.

In summary, the various types of Spanish loanword adaptation found in Triqui can be partially understood by studying communitywide shifts in bilingualism brought about by the different types of contact with Mixtecs in Oaxaca and mestizos and other Spanish speakers outside of Oaxaca. Precolonial Mixtec-Triqui bilingualism set the scene for indirect importation of Spanish loanwords through Mixtec. Some of the earliest Spanish loanwords, mainly government titles and religious terms, were most likely filtered into Triqui through Mixtec. Lack of familiarity with Spanish and structural similarities between Triqui and Mixtec meant that loanwords from that era are highly adapted into Triqui. As changes in infrastructure, agricultural practices and patterns of migration occurred, Spanish loanwords started to enter Triqui more directly through a small group of bilingual speakers although the high degree of monolingualism in the community ensured that the loans that did enter did so with a varying degrees of adaptation. Lastly, politically and economically motivated diaspora has put Triqui into more intense and direct contact
with Spanish, especially in permanent settlements outside of Oaxaca. The increased bilingual competency of these communities has opened Triqui up to many new forms of loanword adaptation, including the increased use of nonce-borrowing and innovative forms of adaptation.

2.3. Overview of Triqui
Triqui, along with Cuicatec and Mixtec, forms the Mixtecan branch of the Otomanguean tree and, as such, has many of the supersegmental features of other Otomanguean languages: it differentiates between nasal and oral vowels, it has laryngeal features such as the glottal stop /ʔ/ and /h/, and it is tonal. What follows is a short description of some of the basic features of Copala Triqui. This description will focus on the basic syllable structure of Triqui and the importance of the final syllable followed by a segmental description divided by vowels and consonants. This segmental description differs from other descriptions (Hollenbach & Hollenbach 1975; Hollenbach 1988, 1984) in that it includes a series of prenasalized obstruents and glottalized segments as single units rather than consonant clusters. Finally, this description will give a brief introduction to tone and tonal morphology and interaction between tone and laryngeals in Copala Triqui.

2.3.1. Syllable Structure
The final syllable carries the important information in Triqui. First, the final syllable is potentially bimoraic while the non-final syllables are monomoraic as seen in example 5. Second, the tone of all preceding syllables can be predicted by the tone of the final syllable. Third, it is only in final syllables and monosyllabic words where we find laryngeal features acting suprasegmentally as in example 6. Finally, certain segmental differences only appear in final syllables such as nasal-oral contrasts in syllable nucleus
(see example 7) and a fortis-lenis (most often realized through voicing) opposition in syllable onsets as in example 8.\textsuperscript{18} ‘L’ is used to represent a laryngeal feature (ʔ or h).

(5) Copala Triqui syllable structure

(6) Laryngeal features in final syllables
\begin{itemize}
  \item a. /yaʔ\textsuperscript{3}/ ‘maguey fiber’
  \item b. /yah\textsuperscript{3}/ ‘ashes’
\end{itemize}

(7) Nasal-oral contrast
\begin{itemize}
  \item a. /yâh\textsuperscript{3}/ ‘paper’
  \item b. /yah\textsuperscript{3}/ ‘ashes’
\end{itemize}

(8) Voicing/fortis-lenis opposition in final syllables\textsuperscript{19}
\begin{itemize}
  \item a. /too\textsuperscript{32}/ ‘milk’
  \item b. /doo\textsuperscript{32}/ ‘sugarcane of’
\end{itemize}

\textsuperscript{18} In the case of sibilants and affricates this tense-lax opposition can appear as degree of frication as well as voicing. In obstruents, voicing is the only opposition.

\textsuperscript{19} While the differentiation that is maintained in final syllables is most often related to voicing in obstruents, in sibilants this differentiation involves both voicing and frication. In this dissertation, I will use tense vs lax in the case of sibilants and voiced vs unvoiced in obstruents.
c. /nokoʔ³/ ‘follow’

d. /nogoʔ³/ ‘return’

e. /chih²/ ‘seven’

f. /shih¹/ ‘big’

Source: (Hollenbach 1984)

Triqui allows only two elements in coda position: the glottal /ʔ/ and laryngeal /h/\(^{20}\). There is little consensus in the literature as to whether laryngeals should be considered a quality of the vowel or if they are to be considered a coda feature of the word. DiCanio argues for laryngeals as segmental features in word final position in Itunyoso Triqui (DiCanio 2008). Matsukawa argues for aspiration and glottalization as a feature of the vowel in Chicahuaxtla Triqui (2008a) and Proto-Triqui (2008b). Hamp (1954) however, calls them interrupted vowels, implying a segmental analysis. In Copala Triqui, Hollenbach (1984) believes aspiration and glottalization to be a suprasegmental feature of the final syllable and not a feature of the vowel. As can be seen in Table 2.3, long oral and nasal vowels can be nasal or oral but not aspirated or glottalized. Short nasal and oral vowels can also be nasal or oral and can also be aspirated and glottalized. It is likely that underlyingly, vowels in Copala Triqui can be divided into nasal, oral, long and short and that nasality is attached to vowel itself (Hollenbach 1984)\(^{21}\) while

\(^{20}\) Hollenbach (1984) describes a ballistic in coda position as well. This feature has no realization of its own and has the effect of shortening the vowel preceding it. See §3.3.5 for a description of this feature. This feature will not be included in this description; instead vowels will be labeled long or short.

\(^{21}\) Hollenbach has also claimed that nasality attaches itself at the word level (Hollenbach
laryngeals are features attach segmentally to the final syllable. In the production, however, aspiration and glottalization most likely become a feature of the vowel.

Syllable onsets may have one to three consonants,\textsuperscript{22} the nucleus can have only one vowel, and final syllables can have one laryngeal.

2.3.2. Segmental Description: Vowels
Copala Triqui has two high vowels, two mid vowels, and one low vowel, each with a nasal and oral counterpart. Mid and high vowels do not contrast in nasality.

Table 2.2. Copala Triqui vowels

<table>
<thead>
<tr>
<th></th>
<th>Front</th>
<th>Central</th>
<th>Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>/i/ /u/</td>
<td>/u/ /â/</td>
<td></td>
</tr>
<tr>
<td>Mid</td>
<td>/e/ (/ê/)</td>
<td>/o/ (/ô/)</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>/a/ /â/</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In nonfinal syllables vowels are always short and oral although they can be pronounced in more lax way such as \(\text{a} \rightarrow \text{o}\) and are often subject to leftward nasal spreading. In final syllables vowels can be \([+/- \text{ nasal}]\) and \([+/- \text{ long}]\). Any vowel that is checked by a laryngeal is short.

(9) Vowel length and laryngeals in final syllables

\[\text{a. } /\text{yaa}^{32}/ \quad \text{‘tongue’}\]

\textsuperscript{32} In my analysis three consonant onsets are rare and only a few loanwords such as mestro, mestra demonstrate this pattern. Clusters containing two consonants are more common and involve a sibilant (r and s) coming into contact with an obstruent or nasal word initially as a result of non-final vowel deletion.
b. /ya\textsuperscript{13}/  ‘true’
c. /yah\textsuperscript{32}/  ‘flower’
d. /yaʔ\textsuperscript{32}/  ‘maguey fiber’

All vowels can be found with each level of tone and in final and nonfinal syllables; however, there are some restrictions caused by nasality and laryngeal features. Mid-nasal vowels (õ, ē) are in complementary distribution with their high-nasal counterparts (ĩ, ũ) and mid-oral vowels are in complementary distribution with their high oral counterparts in short vowels that are not followed by a glottal or aspirated laryngeal (Hollenbach 1984: 46). With the exception of some loanwords, these segments are always produced as a high nasal except when the syllable is checked by a ballistic (Hollenbach 1984: 160).

Table 2.3 The interaction between nasality, height, length, and laryngeals

<table>
<thead>
<tr>
<th></th>
<th>a</th>
<th>e</th>
<th>i</th>
<th>o</th>
<th>u</th>
</tr>
</thead>
<tbody>
<tr>
<td>V:</td>
<td>Naa\textsuperscript{31} (corn field)</td>
<td>Nee\textsuperscript{31} (carmeatne)</td>
<td>Nii\textsuperscript{3} (mother of)</td>
<td>Nacoo\textsuperscript{1} (dry)</td>
<td>Nuu\textsuperscript{32} (v. be inside)</td>
</tr>
<tr>
<td>V:</td>
<td>Nāa\textsuperscript{3} (v. wash)</td>
<td>treẽ4\textsuperscript{*} (train Sp 'tren')</td>
<td>Nahĩĩ\textsuperscript{32} (mom – voc)</td>
<td>Cartõõ4\textsuperscript{*} (carton Sp 'cartón')</td>
<td>Nahũũn\textsuperscript{3} (v. Get well)</td>
</tr>
<tr>
<td>V</td>
<td>Runa\textsuperscript{4} (avocado)</td>
<td>ane\textsuperscript{12} (v. bathes)</td>
<td></td>
<td></td>
<td>to32 (grinding stone)</td>
</tr>
<tr>
<td>V</td>
<td>Naʔmã\textsuperscript{4} (v. fall down)</td>
<td>Neʔẽ\textsuperscript{4} (v. see)</td>
<td>Neʔẽ\textsuperscript{3} (v. see)</td>
<td>to32/tõ\textsuperscript{32} (blood)</td>
<td></td>
</tr>
<tr>
<td>V+h</td>
<td>Nah\textsuperscript{3} (v. remain)</td>
<td>Neh\textsuperscript{32} (dream)</td>
<td>Nih\textsuperscript{32} (ugly/bad)</td>
<td>Noh\textsuperscript{3}/nuh\textsuperscript{3} (1Pl)</td>
<td>Nuh\textsuperscript{3} (skin/leather)</td>
</tr>
<tr>
<td>V+h</td>
<td>Nigãh\textsuperscript{1} (all the time)</td>
<td></td>
<td>Nachrĩh\textsuperscript{12} (v. dry oneself)</td>
<td></td>
<td>Chrũh\textsuperscript{3} (tense)</td>
</tr>
<tr>
<td>V+?</td>
<td>Naʔ\textsuperscript{3} (yes or no?)</td>
<td>Neʔ\textsuperscript{3} (mecate)</td>
<td>Nieʔ\textsuperscript{4} (1P incl)</td>
<td>Noʔ\textsuperscript{3} (3P)</td>
<td>Nuʔ\textsuperscript{3} (complete)</td>
</tr>
<tr>
<td>V+?</td>
<td>Nigã\textsuperscript{13} (all night)</td>
<td></td>
<td></td>
<td></td>
<td>Tzĩʔ\textsuperscript{3} (very small)</td>
</tr>
</tbody>
</table>

* These words are also pronounced with a raised vowel by older monolingual speakers. Younger speakers produce both forms, often in the same elicitation session.
2.3.3. Segmental Description: Consonants
Triqui has 34 consonants although four of those, /p/, /b/, /mB/, and /h/, are considered to be borrowed from Spanish. Some of the notable features of Triqui’s consonant system include the presence of glottalized segments and prenasalized segments. Also of note is the complexity of its sibilants which includes rhotics and retroflex sibilants.

Table 2.4. Overview of Triqui consonants

<table>
<thead>
<tr>
<th></th>
<th>Bilabial</th>
<th>Labiodental</th>
<th>Alveolar</th>
<th>Alveo-palatal</th>
<th>Alveo-palatal (retroflex)</th>
<th>Palatal</th>
<th>Velar (labiovelar)</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voiceless stop</td>
<td>/p/*</td>
<td>/l/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>/k/ /k/*/</td>
</tr>
<tr>
<td>Voiced stop</td>
<td>/b/* /mB/*</td>
<td>/d/ /nD/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>/g/ /g/*/ /ŋG/</td>
</tr>
<tr>
<td>Affricates</td>
<td></td>
<td>/ts/</td>
<td>/ʃ/</td>
<td></td>
<td>/tʃ/</td>
<td></td>
<td></td>
<td>/t$/</td>
</tr>
<tr>
<td>Voiceless fricatives</td>
<td></td>
<td>/s/ /ʃ/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>/ʃ**</td>
</tr>
<tr>
<td>Voiced fricatives</td>
<td></td>
<td>/z/ /ʒ/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>/z/</td>
</tr>
<tr>
<td>Nasals</td>
<td></td>
<td>/m/</td>
<td>/n/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>/m/</td>
</tr>
<tr>
<td>Liquids</td>
<td></td>
<td>/l/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>/l/</td>
</tr>
<tr>
<td>Trill</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>/ʔl/ /ʔn/ /ʔm/ /ʔnd/ /ʔβ/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glides</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>/ʔ/ /β/ /ŋg/ /ʔ/ h/*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laryngeals</td>
<td>/ʔm/</td>
<td></td>
<td>/ʔn/</td>
<td>/ʔl/ /ʔnd/</td>
<td>/ʔy/ /ʔŋg/ /ʔβ/ /ʔ//h/*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Only found in loanwords
** This sound does not exist in Itunyoso or Chicahuaxtla Triqui and may be more recently derived in Copala Triqui (Matsukawa 2008) or lost in the other two dialects.

This analysis differs slightly from earlier descriptions (Hollenbach 1975, 1977a, 1984, 2005a,b, 2009) by including six glottalized segments (ʔl, ʔn, ʔy, ʔm, ʔŋg, ʔnd, ʔw), three

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23 Although this symbol would normally be classified as a bilabial fricative I am using it as a labiovelar glide following (DiCanio 2008). This is actually an archephoneme /W/ and can be pronounced as /w/, /b/ or /β/.

54
prenasalized obstruents (nd, ŋg, mb), and two labiovelar obstruents (kw, gw) as unit phonemes rather than consonant clusters. In the case of labiovelar obstruents, each can be found in all three dialects of Triqui and can be traced back to Proto-Triqui (Matsukawa 2008).

There are a few reasons for including the glottalized segments and nasalized obstruents as unit phonemes rather than consonant clusters. The first is that, except for in a few rare cases, these segments do not occur in nonfinal syllables. Most consonant clusters in Copala Triqui involve a sonorant + stop/nasal and occur word—initially as a result of vowel deletion (see rule 1 in below). Prenasalized segments are only found in monosyllabic words and in final syllables suggesting that they are, at the very least, different from more traditional consonant clusters in the language. A second reason for including them as unit phonemes is the existence of segments in native words such as /ʃʔnaa/ meaning ‘hunger’ and in loanwords like /la.mbre/ meaning ‘wire’. If these segments are analyzed as consonant clusters then that would lead to the conclusion that Triqui allows consonant clusters of up to three consonants, which is the conclusion that Hollenbach (1984) comes to. Analyzing these as single units shows that Triqui continues

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24 Hollenbach (1975, 1977a) considers the velar + w, nasal + obstruent, and glottal + sonorant to be consonant clusters in earlier publications. She then considers them to be clusters that developed from unit phonemes (Hollenbach 1984: 62). Finally, she considers the velar + w to be single units and does not mention prenasalized stops and glottalized sonorants (Hollenbach 2009).

25 One involves a reduplication of the final syllable and one is another version of a word that does follow the rule.
to discourage consonant clusters allowing for only sibilant + C onsets created by deletion of vowels as well as well as obstruent + glottalized sonorant consonant clusters.\textsuperscript{26}

**Obstruents in Copala Triqui**

Triqui has eight obstruents, four voiced (b, d, g, g\textsuperscript{w}) and four voiceless (p, t, k, k\textsuperscript{w}). Both bilabial obstruents are considered to be borrowed from Spanish.

(10) Obstruents (Hollenbach 1984: 56)

<table>
<thead>
<tr>
<th>Letter</th>
<th>Pronunciation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. pij\textsuperscript{5}</td>
<td>‘kind of frog’</td>
<td></td>
</tr>
<tr>
<td>b. lape\textsuperscript{4}</td>
<td>‘pencil’ (Sp ‘lápiz’)</td>
<td></td>
</tr>
<tr>
<td>c. baj\textsuperscript{5}</td>
<td>‘compadre of’ (Sp ‘compadre’)</td>
<td></td>
</tr>
<tr>
<td>d. to\textsuperscript{32}</td>
<td>‘milk’</td>
<td></td>
</tr>
<tr>
<td>e. do\textsuperscript{4}</td>
<td>‘palm basket of’</td>
<td></td>
</tr>
<tr>
<td>f. ku\textsuperscript{5}</td>
<td>‘bone’</td>
<td></td>
</tr>
<tr>
<td>g. k\textsuperscript{w}eh\textsuperscript{3}</td>
<td>‘pus’</td>
<td></td>
</tr>
<tr>
<td>h. goj\textsuperscript{3}</td>
<td>‘last year’</td>
<td></td>
</tr>
<tr>
<td>i. g\textsuperscript{w}ii\textsuperscript{3}</td>
<td>‘sun/day’</td>
<td></td>
</tr>
</tbody>
</table>

In final syllables they are separate phonemes; in nonfinal syllables this voicing distinction no longer exists and either can occur.\textsuperscript{27} In final syllables and monosyllabic words such as the ones found in example 11 these sounds are separate phonemes. In

\textsuperscript{26} For a similar analysis in Itunyoso Triqui see DiCanio (2008).

\textsuperscript{27} Since in obstruents these rules only affect voicing, I will not refer to obstruents as tense and lax (as in Hollenbach 1984) but as voiced and voiceless.
nonfinal syllables as in example 12 there is neutralization.²⁸ Lastly, voicing is nondistinctive in nasal + obstruent (N-O) sequences as seen in example 13, which are found almost exclusively in monosyllabic words and the onset of a final syllable.

(11) Distinctive Voicing in final syllables and monosyllabic words

a. /dã³²/ ‘that one’
b. /tã³²/ ‘blood’
c. /gãʔ¹/ ‘far’
d. /kãʔ³/ ‘grindings’

(12) Voicing Neutralization in nonfinal syllables

a. /kiriʔ³/ ‘bought’   [kiri³]~[giri³]
b. /taʔnii⁵/ ‘child’    [taʔnii⁵]~[daʔnii⁵]

(13) Voicing Neutralization in native N-O sequences

a. /nDo³²/ ‘a lot, many’   [ndo³²] ~ [nto³²]
b. /nGaa³¹/ ‘cloud’      [ŋgaa³¹] ~ [ŋkaa³¹]
c. /mBaʔ³/ a type of ‘sqash’   [mpaʔ³] ~ [mbaʔ³]²⁹

²⁸ Hollenbach (1984) chose to represent these sounds as underlyingly voiceless but cites her reasoning as beyond the scope of that study.

²⁹ This is the only native word in Hollenbach’s data with a bilabial nasal obstruent sequence and not all dialects share this. This word is alternatively said as ma³ and wa³ since, according to Hollenbach, mb and nd often vary freely with m and n (Hollenbach
Of note is a native process for velarization of bilabials in Triqui. Historically, only one bilabial element (b, p, m, w) could occur in the same lexical item. As Spanish has not such rule, many Spanish loans with two bilabials go through velarization in order to satisfy this rule giving us loans such as /visiko⁴/ and /biziko⁴/ from the Spanish obispo ‘bishop’ (Hollenbach 1973:88). While she does not specify whether this rule applies to rounded vowels she also gives examples such as /gwato⁴/ from the Spanish pato ‘duck’ and in elicitation session with monolingual speakers I have recorded examples such as /kombero⁴/ from the Spanish bombero ‘fire fighter’ and /kolosia⁴/ for the Spanish policia ‘police’. This rule, however, does not seem to be productive in the language of bilinguals and it is unclear if it is phasing out of the language altogether or if increased faithfulness to input form due to increased linguistic consciousness is to blame.

Prenasalized obstruents in Copala Triqui function as segments and include the alveolar /nd/, the velar /ŋg/, and the bilabial /mb/. While the third is not accepted in all dialects, it is becoming more prevalent in loanwords and will be included in this analysis.

(14) Prenasalized obstruents in Copala Triqui

a. /ndaɑ⁵/ ‘until’
b. /ŋgɑ⁵/ ‘cloud’
c. /mbaʔ⁵/ ‘type of squash’³⁰
d. /kambo⁴/ ‘field, countryside’ (Sp ‘campo’)

She also claims that Spanish loans are stabilizing these less common nasal + obstruent consonant clusters (Hollenbach 1977).

³⁰ Other dialects pronounce this word as /maʔ⁵/.
Affricates in Copala Triqui
Affricates in Copala Triqui have three points of articulation: alveolar, palatal, and retroflex as can be seen in example 15.

(15) Affricates in Copala Triqui
a. /katsii¹/ ‘white’

b. /tsi¹/ ‘sweet’

c. /katʃi⁵h²/ ‘cotton’ (fiber)

d. /chih²/ ‘seven’

e. /katʃi⁵i³/ ‘wheel’

The alveolar and retroflex affricates are restricted to final syllables and are most often found in monosyllabic words (Hollenbach 1984: 61). This is universally true for the retroflex and alveolar but has exceptions in the case of the palatal as in example 16. In all cases, the final syllable starts with a laryngeal, a glide, or it is onsetless.³¹

(16) Alveopalatal affricate in nonfinal syllables
a. /tʃiʔi ;³¹/ ‘sickness’

³¹ Both Hamp (1954) and Longacre (1952: 75-76) argue for the interpretation of VʔV and VhV sequences as medially checked vowel that is one syllable (Longacre) and even as a unit phoneme (Hemp). Also relevant is the fact that ?, h, and glides are the only segments that are transparent in leftward nasal spreading (Hollenbach 1984: 53).
b. /tʃaʔa:\/ \textsuperscript{31} ‘dove’

c. /tʃi.ã\:\textsuperscript{3} /v. ‘bite’

d. /tʃuβe:\/ ‘dog’

**Sibilants in Copala Triqui**

The description of Triqui sibilants has varied slightly in the literature. Hollenbach (1975) outlines three sets of sibilants—one voiced, one voiceless, and one neutralized—each with an alveolar, alveopalatal and retroflex pronunciation as in Table 2.5 (below).

**Table 2.5 Sibilants as outlined in Hollenbach (1975)**

<table>
<thead>
<tr>
<th></th>
<th>Alveolar</th>
<th>Alveopalatal</th>
<th>Retroflex\textsuperscript{32}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voiceless (tense)</td>
<td>/s/</td>
<td>/ʃ/</td>
<td>/ʂ/</td>
</tr>
<tr>
<td>Voiced (lax)</td>
<td>/z/</td>
<td>/ʒ/</td>
<td>/r/</td>
</tr>
<tr>
<td>Neutralized</td>
<td>/tʃ<del>s</del>z~/</td>
<td>/tʃ<del>ʃ</del> ʒ/</td>
<td>/tʂ<del>ʂ</del>r/</td>
</tr>
</tbody>
</table>

As with obstruents, sibilants are faithful to voicing in final syllables and in monosyllabic words as in example 17 but can be optionally voiced in non-final syllables as in example 18. They are a little different from obstruents in that they have a lax series, /z/ and /ʒ/, which is a little more variable, showing neutralization in both nonfinal syllables as well as in final syllables and in monosyllabic words. In addition, they can be [+/- voice] as well as [+/- affricate] as in 19.

(17) Distinctive voicing of tense series (Hollenbach 1984: 14)

a. sih\textsuperscript{32} ‘leader’

b. zih\textsuperscript{5} ‘arrives’

(18) Neutralization of tense series: /sando\textsuperscript{4}/ ‘cemetery’ (Sp ‘camposanto’)  

\textsuperscript{32} While Hollenbach never calls the ‘r’ a retroflex it makes the most sense to place it in this category since it is included in the neutralized category.
(19) Neutralization of lax series /zoʔ²/ (2 person sing)

a. [soʔ²] ~ [zoʔ²] ~ [tsoʔ²] ~ [dzoʔ²]

Hollenbach (1984) maintains the voiced and voiceless sibilants across all three places of articulation but does not mention the neutralized variants. In her popular grammar, Hollenbach (2005a) returns to her three way description of sibilants as having a ‘strong’ realization in the cases of /s/ and /ʃ/ and a ‘weak’ pronunciation in the case of /z/ and /ʒ/, as well as an ‘undifferentiated’ pronunciation that occurs in nonfinal syllables and when a sibilant comes into contact with a consonant due to vowel deletion (see Rule 1 below). In the case of alveolars and alveopalatals, the ‘strong’ and ‘weak’ variants are separate phonemes. The ‘r’ in this grammar, however, is now one phoneme with situational allophonic variation; between vowels it has a flaplike pronunciation and elsewhere it has a retroflex pronunciation with more or less trill. Finally, in 2009, she maintains the voiced and voiceless alveolars and alveopalatals as well as a voiceless retroflex /ʂ/; the ‘r’ again is classified as an alveolar flap /ɾ/ with a voiced retroflex sibilant allophone (Hollenbach 2009).

(20) Sibilants in Copala Triqui

   a. /sih¹/    ‘leader, chief’
   b. /ʃih³₂/   ‘head lice’
   c. /soh³₂/   ‘pants’
   d. /zaʔ¹/    ‘good’
   e. /ʒaa³/    ‘squirrel’
   f. /reh³/    ‘father’ (pos)

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This description of Copala Triqui sibilants is slightly different from other descriptions of the retroflex consonants /ʂ/ and /r/. First, this study categorizes the ‘r’ as a sibilant following Hollenbach (1984b) rather than as a resonant (Matsukawa 2008) or as a liquid as is the case in Itunyoso Triqui (DiCanio 2008). The fact that ‘r’ takes part in rules for sibilants is the main reason for including this sound as a sibilant in Copala Triqui (see Rule 1 below).

**Rule 1:** Vowels are deleted in non-final syllables between sibilants and obstruents (*g), nasals, and affricates. ($V \rightarrow 0 / s,f,r_{affricates}, obs, son,*g$)

a. /runee$^{32}$/ → /nee$^{32}$/ ‘bean’
b. /rakwi$^{3}$/ → /rk$^{*i}\bar{\imath}$/ ‘to help’
c. /ʃutah$^{32}$/ → /ftah$^{32}$/ ‘bird’

The second main divergence is in the use of the voiceless retroflex sibilant. Of the three sibilants, only the alveolar and alveopalatalals as well as the alveolar flap /r/ are shared by all three dialects of Triqui. The retroflex sibilant /ʂ/ is only described in Copala Triqui. One explanation has been that this sound is a derived phoneme that came about when the /ʃ/ came into contact the retroflex affricate /tʂ/ and the flap /r/ through a process of vowel deletion in non-final syllables in words like /ʂoh$^{32}$/ ‘pants’ and /ʂikii$^{3}$/ ‘frog’, (Matsukawa 2007). Although there is evidence of nonfinal vowel deletion in Itunyoso Triqui (DiCanio 2008), of the three dialects, Copala Triqui seems to be the most progressive. As these nonfinal vowels started to delete they put the /r/ in contact with other consonants which in turn causes the ‘r’ to take on the fortis pronunciation of /ʂ/ (see Rule 2). As these shortened lexical items become the accepted form, the sibilant /ʂ/ is

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$^{33}$ In Chicahuaxtla Triqui these words are /ʃitʂoh$^{3}$o/ and /ʃirikii$^{3}$/ (Good 1979).
becoming more and more commonplace.

Rule 2: The voiced retroflex flap changes to a voiceless retroflex sibilant before a nasal or obstruent. \((r \rightarrow \text{s}_\text{obst}, \text{nas})\)

a. /rnee\textsuperscript{32}/ \(\rightarrow\) /snee\textsuperscript{32}/ ‘bean’

b. /rk\textsuperscript{w}i\textsuperscript{5}/ \(\rightarrow\) /sk\textsuperscript{w}i\textsuperscript{5}/ ‘to help’

c. /rne\textsuperscript{d}/ \(\rightarrow\) /sn\textsuperscript{d}/ ‘aguardiente’ (Sp 'aguardiente').

The existence of /s/ in a limited number of contexts such as /ʃ/ merging with /tʂ/ or /t/ as outlined by Matsukawa (2008) seems to have generalized to other contexts as outlined in Rule 2 above. In addition, the presence of intervocalic minimal pairs in some dialects seems to hint that this sound may have a broader use than once thought. Figures 2.2 and 2.3 are spectrograms of the Triqui words for green /maʂee\textsuperscript{31}/ and red /maree\textsuperscript{13}/ as spoken by a Triqui-dominant bilingual from Tierra Blanca, one of the towns outside of the San Juan Copala. Since this sound is between vowels we would expect to get a flap like pronunciation in both words, as predicted in Hollenbach (2005a). This does not happen and instead we find a consistent distinction between these two sounds not only intervocically but in the final syllable, where distinctions between separate phonemes should be maintained.
Figure 2.2. Spectrogram of ‘green pencil’
Lape $^4$ mašee $^{31}a$ $^{32}$
Pencil green decl

Figure 2.3. Spectrogram of ‘red pencil’
lape $^4$ maree $^{13}a$ $^{32}$
pencil red decl
Sonorants in Copala Triqui

Sonorants in Triqui are found freely in final and nonfinal syllable. Triqui has five sonorants: two nasals, one lateral, and two glides. While the ‘r’ does have a sonorant-like pronunciation, it patterns like a sibilant in Copala Triqui. The nasals can be divided into alveolar /n/ and bilabial /m/ although a velar nasal /ŋ/ is produced in the prenasalized velar obstruent /ŋG/. The lateral and the glides are produced in a similar fashion to the Spanish /l/, /w/, and /y/ although the glides have a few restrictions. The palatal glide can only be followed by mid and back vowels, not front vowels (*yi, *ye) and increasingly it can be found following alveolar sounds (n, s, d, t) in Spanish loanwords. The labio-velar glide can be followed by front and central vowels but not back vowels (*wo, *wu). It is pronounced as a /w/ in the labiovelar consonants and can take a variety of pronunciations in other positions of the word including [b], [w], and [β]. While this segment seems to surface as a glide, fricative, or obstruent, its presence in a series of glottalized sonorants (described below) is a strong motivation for considering this sound to be a sonorant and not a stop or fricative. However, following Matsukawa (2008) and DiCanio (2008), this sonorant will be written as /β/ and not /w/ in this dissertation. In addition, there is no consistent distribution of the bilabial glide, neither in the literature nor in my data. First this sound is defined as a glide in consonant groups and before low vowels and fricative elsewhere (Hollenbach 1975). It has also been described as a bilabial fricative unless contiguous to a consonant or long vowel (Hollenbach 1977a). Later it is defined as a

34 One exception to this rule is yih (stone). This happened when the Proto-Triqui /ə/ changed to /i/ in Copala Triqui (Matsukawa 2008).
sonorant and there was no mention of a bilabial voiced fricative anywhere (Hollenbach 1984). Finally, the two variants (no mention of the obstruent realization) are considered to be in complementary distribution; the fricative occurring before front vowels and the glide before low vowels (Hollenbach 1984b). I have not found this distinction in my data. It may be that the two are in relatively free variation with each other word initially and between vowels and may rely more in the dialect or idiolect of the speaker as well as how rapidly he or she is speaking.

(21) Sonorants in Copala Triqui

a. /mããʒ/ ‘rain’
b. /anããʒ/ ‘to wash one’s face’ (CON)
c. /luuʒ/ ‘cat’
d. /yããʒ/ ‘is sitting’
e. /βihʃ/ ‘two’

Glottalized Segments and Prenasalized Stops
Glottalized sonorants, along with prenasalized obstruents, have been classified as consonant clusters in Copala Triqui (Hollenbach 1975, 1977, 1984b). As in DiCanio (2008), I treat these as single units because these sounds only occur in final syllables and because consonant clusters found in Triqui are normally restricted to sibilant + obstruent/nasal found word initially (resulting from vowel deletion). The glottalized consonants include ʔn, ʔy, ʔl, ʔβ, ʔm, ʔnd, ʔŋg.\(^{36}\)

\(^{35}\) The only exception is ndo’o which is another version of ndo ‘a lot’.

\(^{36}\) DiCanio also has ʔr for Itunyoso Triqui. In addition, Hollenbach (1977a) only gives one
(22) Glottalized consonants in Copala Triqui

a. /ʔyah^3/ ‘to do/to make’

b. /ʔnuu^5/ ‘corn’

c. /tuʔβa^3/ ‘mouth of’

d. /toʔloo^3/ ‘rooster’

e. /taʔŋgaʔ^2/ ‘a lot’

f. /aʔmii^32/ ‘to speak’

g. /ʃikuʔndu^1/ ‘eyelash’

In sum, Triqui has 34 consonants. Of these consonants only the sonorants occur freely in final and nonfinal syllables. Obstruents, including labial-velars /k^w, g^w/, and the palatal affricate occur freely in final syllables and lose the distinction between tense and lax series in nonfinal syllables. The alveolar and retroflex affricate, glottalized sonorants, and prenasalized obstruents only occur in final syllables.

2.3.4. Triqui and Spanish Consonants, Side by Side

Table 2.6 gives a preliminary overview of Triqui and Spanish segmental inventories organized by level of sonority. By organizing the table in this way there are two things to point out. First, there are five sounds in Spanish that do not exist in Triqui. Of the five Spanish phonemes not present in Triqui, three (/b/, /p/, /h/) have been established as borrowed in the literature (Hollenbach 1984) and are used by bilinguals and

e
example of /ʔnd/, ʒiguʔndu^1 ‘eyelash’.

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monolinguals, two (/l/ and /ɾ/) are not found in the literature, and the fifth (/ɲ/) is not included phonemically although it does exist in Triqui as an allophone of the /y/ in contact with a nasal vowel. Second, even in the case of sounds that are shared, some are classified differently. The ‘r’, for example, is considered a sonorant in Spanish and a sibilant in Triqui. The ‘ñ’ is a phoneme in Spanish and an allophone in Triqui.

Table 2.6. Comparison of Spanish and Triqui allophones by level of sonority

<table>
<thead>
<tr>
<th>Characteristics of segment</th>
<th>Segments in Triqui</th>
<th>Segments in Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td>[+son][−nas]</td>
<td>/l/</td>
<td>/l/ /l/ /ɾ/</td>
</tr>
<tr>
<td>[+son][+nas]</td>
<td>/m/ /n/</td>
<td>/m/ /n/ /ɾ/</td>
</tr>
<tr>
<td>[−son][+cont][+voice]</td>
<td>/β/ /z/ /ʃ/ /ɾ/ /ɾ/ ***</td>
<td></td>
</tr>
<tr>
<td>[−son][+cont][−voice]</td>
<td>/s/ /ʃ/ /ʂ/ /ŋ/ ** /ɾ/ ***</td>
<td>/ɦ/ /h/ /s/</td>
</tr>
<tr>
<td>[−son][−cont][+voice]</td>
<td>/b/* /d/ /g/ /gw/ /nd/ /mb/ /ŋk/ /nβ/ /nγ/ /nɔ/ /nɔm/ /nɔn/ /nɔnd/ /ŋŋ/</td>
<td>/b/ /d/ /ɡ/</td>
</tr>
<tr>
<td>[−son][−cont][−voice]</td>
<td>/p/* /t/ /k/ /kw/ /tʃ/ /tʂ/ /ɾ/</td>
<td>/p/ /t/ /k/ /tʃ/</td>
</tr>
</tbody>
</table>

* Borrowed in Triqui according to Hollenbach (1984, 2005b)
** Used suprasegmentally in Triqui native words
*** Not currently included in Hollenbach (1984, 2005b)

2.3.5. Tone in Copala Triqui
Triqui is among a minority of languages that contain five distinctive levels of tone. In addition, tone is used lexically (each word has at least one lexically linked tone) as well as grammatically (aspect is marked partially by tone and some truncation involving clitic

There is not sufficient documentation of Copala Triqui rhotics to definitively conclude that /rr/ did not previously exist. Belmar (1897), for example, includes ‘rr’ and ‘r’ in his description of Chicahuaxtla Triqui but Hollenbach (1984) shows only one rhotic with multiple pronunciations.

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pronouns affects tone). Figure 2.4 is a representation of tone in Copala Triqui. The mid tone (3) is the most level tone; the low tones (1 and 2) are also relatively level, falling only slightly when measured in more detail; and the high tones (4 and 5) both start around the level of a 3 and rise accordingly. The contour tones consist of a combination of these five tones and they include 13, 31, and 32.

Figure 2.4. Tones in Copala Triqui

Source: Hollenbach (2005b)

As seen in example 17, many words are differentiated only by tone. In this dissertation, tones will be represented using superscripted numbers, 1 being the lowest tone and 5 the highest.

(23) Tonal minimal pairs in Triqui (Hollenbach 1984)

<table>
<thead>
<tr>
<th>Tone</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>/yä₁/</td>
</tr>
<tr>
<td></td>
<td>‘-one (in compounds like twenty-one)’</td>
</tr>
<tr>
<td>2</td>
<td>/yä₂/</td>
</tr>
<tr>
<td></td>
<td>‘unmarried’</td>
</tr>
<tr>
<td>31</td>
<td>/yä³₁/</td>
</tr>
<tr>
<td></td>
<td>‘scar’</td>
</tr>
<tr>
<td>32</td>
<td>/yä³₂/</td>
</tr>
<tr>
<td></td>
<td>‘salt’</td>
</tr>
<tr>
<td>4</td>
<td>/yä⁴/</td>
</tr>
<tr>
<td></td>
<td>‘corncob’</td>
</tr>
<tr>
<td>5</td>
<td>/yä⁵/</td>
</tr>
<tr>
<td></td>
<td>‘is sitting’</td>
</tr>
</tbody>
</table>

Triqui has simple and complex words. Simple words have one lexically linked tone and
complex words have two lexically linked tones. There are no examples of words with three or more lexically linked tones. In simple words, tones at the underlying level are associated with the rightmost edge of the word.

(24) Assignment of tone in simple words

<table>
<thead>
<tr>
<th>Underlying form</th>
<th>3 1</th>
<th>‘cause to explode’ (Hollenbach 1984: 109)</th>
</tr>
</thead>
<tbody>
<tr>
<td>tukwanu</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initial association

<table>
<thead>
<tr>
<th>Underlying form</th>
<th>3 1</th>
<th>‘cause to explode’ (Hollenbach 1984: 109)</th>
</tr>
</thead>
<tbody>
<tr>
<td>tukwanu</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No crossing

<table>
<thead>
<tr>
<th>Underlying form</th>
<th>3 1</th>
<th>‘cause to explode’ (Hollenbach 1984: 109)</th>
</tr>
</thead>
<tbody>
<tr>
<td>tukwanu</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The rest of the tones in a word are assigned through tone epenthesis rules. This epenthesized tone, however, is a ‘blanched’ tone. Syllables preceding low tone or rising contour tone (1, 2, and 13) get a 2 tone; syllables preceding a mid to high tone and falling contour tones (3, 32, 31, 4, 5) get a 3 tone. Once the epenthesized tone is established, it is associated with all vowels preceding the lexical tone. This epenthesized tone spreads leftward to the left edge of the word or until the next lexically linked tone. The method of associating epenthesized tone with toneless syllables is done through what Hollenbach calls ‘Convention 2’. This means that the example above would surface as [tu^3kwa^3nu^31] even if underlingly it is represented as /tukwanu^31/. The example below shows how this Convention 2 works in a verb with a rising contour tone.

(25) Application of Convention 2 (tone epenthesis)

<table>
<thead>
<tr>
<th>Underlying form</th>
<th>1 3</th>
<th>‘will fill’</th>
</tr>
</thead>
<tbody>
<tr>
<td>kara</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initial association

<table>
<thead>
<tr>
<th>Underlying form</th>
<th>1 3</th>
<th>‘will fill’</th>
</tr>
</thead>
<tbody>
<tr>
<td>kara</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No crossing

<table>
<thead>
<tr>
<th>Underlying form</th>
<th>1 3</th>
<th>‘will fill’</th>
</tr>
</thead>
<tbody>
<tr>
<td>kara</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In this dissertation, unless otherwise specified, words will be written with phonemic tone.

(26) Tone patterns in simple words

<table>
<thead>
<tr>
<th>Tone</th>
<th>Symbol</th>
<th>Phoneme</th>
<th>Tense</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>/nakaa/</td>
<td>[na'kaa]</td>
<td>adj</td>
<td>‘new’</td>
</tr>
<tr>
<td>b.</td>
<td>/nika/</td>
<td>[ni'ka]</td>
<td>adj</td>
<td>‘straight’</td>
</tr>
<tr>
<td>c.</td>
<td>/tʃuvee/</td>
<td>[chu'vé]</td>
<td>n</td>
<td>‘dog’</td>
</tr>
<tr>
<td>d.</td>
<td>/nano/</td>
<td>[na'o]</td>
<td>v</td>
<td>‘tell a story’</td>
</tr>
<tr>
<td>e.</td>
<td>/yuvee/</td>
<td>[yu've]</td>
<td>n</td>
<td>‘mat/bedroll’</td>
</tr>
<tr>
<td>f.</td>
<td>/nato/</td>
<td>[na'to]</td>
<td>n</td>
<td>‘banana’</td>
</tr>
<tr>
<td>g.</td>
<td>/tʃuvaa/</td>
<td>[tʃu'vea]</td>
<td>n</td>
<td>‘lion’</td>
</tr>
<tr>
<td>h.</td>
<td>/naʔno/</td>
<td>[naʔno]</td>
<td>n</td>
<td>‘mask’</td>
</tr>
</tbody>
</table>

Complex words carry lexically linked tone in final syllables as well as on a nonfinal syllable. According to Hollenbach, approximately 20% of all polysyllabic words are complex words, comprising compound words and Spanish loans (Hollenbach 1984b: 15). Some examples of complex words can be found in example 21. The process for assigning tone is similar to that of complex words except that the underlying form includes a lexically linked tone (Hollenbach 1984).
(27) Assignment of tone in complex words

Underlying form  5 1 3  ‘make a fuss over’
   | arayaʔãh
Initial association  5 1 3  arayaʔãh
No crossing  5 1 3  arayaʔãh
Epenthesis  3 5 2 1 3  arayaʔãh
Convention 2  3 5 2 1 3  arayaʔãh

As a note, in all cases the lexically linked nonfinal tone is either 3 or 5. Only one exception can be found: *chuu³²me⁴* or ‘owl’, which comes from /chəuu³¹/ ‘owl’ and /yume⁴/ 'gray'. It is of note that this word does not participate in tone changing rules (F1 or F2), which are introduced in §2.3.6.

(28) Complex native words

a. /li³rā¹/  'lizard' (rā³¹ -'lightning')
b. /ku³yanh¹/  'candle' (from /kuu⁵/ 'bone' and /yanj⁵/ 'wax')
c. sno⁵ʔo³²  'man'
d. /ka³ʃū²¹/  'shade'
e. /ʃa³na¹/  'woman'
f. /na³na¹/  'wind/air; word'
While Hollenbach does not specify which loans are considered complex words, it can be
assumed that they are the ones with nonfinal tones that are not derived from the final
syllable. It is of note that this pattern emerges from two different sources. In example
22a,b, it is due to some sort of faithfulness to the stress or pitch of the input form and in
22(c–e), it is the result of word-final vowel epenthesis. Finally, Hollenbach also
consistently labels the nonfinal tone of loanwords where the penultimate syllable is
stressed in the input Spanish form as seen in row f. These words end in a 4 tone and
would get a 3 tone anyway so it is of note that these words are labeled as complex

(29) Complex loanwords

a. /mi³sika¹/ ‘band/orchestra’ (Sp ’música’)

b. /ma³kina¹/ ‘machine’ (Sp ’máquina’)

c. /dyo³se¹/ ‘God’ (Sp ’dios’)

d. /wa³re¹/ ‘pair’ (Sp ’par’)

e. /rku³se¹/ ‘cross’ (Sp ’cruz’)

f. /me³sa⁴/ ‘table’ (Sp ’mesa’)

2.3.6. Laryngeals and Tone in Copala Triqui

As previously mentioned, Triqui has a two of laryngeals, a glottal /ʔ/, and an
aspirated /h/. They are used as segmental features when they are in the onset of a
syllable,\(^{38}\) word finally they are considered to be supersegmental features along with tone.

Laryngeals take up the second half of the mora (see section 2.3.1) and for that reason no
long vowels can be found with a laryngeal. There are some restrictions regarding
laryngeals and tone. The /h/ does not occur in words with tone 4 (Hollenbach 1984), the

\(^{38}\) The /h/ is used segmentally, or prevocally, only in loanwords from Spanish.
glottal /ʔ/ cannot be found in syllables with 5 or 32 tone, and neither laryngeal can be found in syllables with 31 tone.\textsuperscript{39}

Table 2.7. Tones and laryngeals in Copala Triqui

<table>
<thead>
<tr>
<th></th>
<th>V</th>
<th>VV</th>
<th>Vh</th>
<th>Vʔ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>no\textsuperscript{1} (blessed)</td>
<td>daa\textsuperscript{1} (blurry)</td>
<td>kuh\textsuperscript{1} (bone possess)</td>
<td>tziʔ\textsuperscript{1} (sweet)</td>
</tr>
<tr>
<td>2</td>
<td>naʔ/laʔ (soggy)</td>
<td>tšuun\textsuperscript{2} (wise)</td>
<td>tʃih\textsuperscript{2} (seven)</td>
<td>tʃiʔ\textsuperscript{2} (ten)</td>
</tr>
<tr>
<td>3</td>
<td>me\textsuperscript{4} (to be)</td>
<td>taa\textsuperscript{2} (flat land)</td>
<td>yah\textsuperscript{2} (ashes)</td>
<td>kaʔ\textsuperscript{2} (pine 'ocote')</td>
</tr>
<tr>
<td>4</td>
<td>no\textsuperscript{3} (stuck)\textsuperscript{40}</td>
<td>taa\textsuperscript{4} (better adv)</td>
<td>niʔ\textsuperscript{4} (1person pl incl)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>taa\textsuperscript{3} (mounted v)</td>
<td>nah\textsuperscript{3} (remain)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>nga\textsuperscript{13} (viejo adj)</td>
<td>tʃee\textsuperscript{13} (bad)</td>
<td>nah\textsuperscript{13} (so)</td>
<td>miʔ\textsuperscript{13} (marine blue)</td>
</tr>
<tr>
<td>31</td>
<td></td>
<td>yoo\textsuperscript{31} (sap)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>na\textsuperscript{32} (water)</td>
<td>too\textsuperscript{32} (milk)</td>
<td>tah\textsuperscript{32} (say)</td>
<td></td>
</tr>
</tbody>
</table>

Of the categories above, only the glottal is not found in in the context of loanwords. Long and short vowels are the most common outcome. Hollenbach has argued for an interpretation of short vowels as inherently containing a ballistic, which is an abstract feature with no phonetic content that exists at the supersegmental tier (Hollenbach 1984). According to Hollenbach, this feature cannot occur with high vowels and, when it accompanies mid to low vowels, it has the effect of shortening and laxing them. She supports the claim that a ballistic exists by showing how the duration of a vowel with this feature decreases from an average of 0.12 seconds to 0.9 seconds when it receives

\textsuperscript{39} The fact that syllables with 31 tone are restricted to long vowels indicates that this tone pattern may have some additional qualities that are not currently known. DiCanio (2008) points out other irregularities in this tone pattern in Itunyoso Triqui.

\textsuperscript{40} Hollenbach (1984) claims that the short vowel is actually a ballistic in Copala Triqui. In her description, this ballistic is only found in mid to low tones and in tone 4 causes it to be realized as 43.
sentence stress. Long vowels, alternatively, increase from 0.25 to 0.31 seconds in the same contexts. Finally, what is most relevant to loans is the fact that it is reported to change the quality of high tones, in this case the 4 tone goes from its normal upglide realization of 34 to a downglide of 43. Example 30 below shows an example of what Hollenbach considers to be a minimal pair between a word with a short vowel 30a and another with the ballistic feature 30b and her representations of them in a later publication.

(30) Ballistic and short vowel minimal pair (Hollenbach 1984b: 131, 2005)

b. to!32 (1984) to32 (2005a) 'straw mat'

Besides the examples above, there is other evidence against a ballistic analysis. Copala Triqui is the only dialect of Triqui that has documented this ballistic feature. Descriptions of Itunyoso Triqui (DiCanio 2008) and Chicahuaxtla Triqui (Longacre 1952, 1975, 1959) do not mention a ballistic feature although both include a 43 tone as part of the tonal inventory. In the case of loanwords with 4 tone in Copala Triqui, there is evidence of a 34 upglide in loans taken from Spanish inputs with final stress and 43 downglide in loans taken from inputs with penultimate stress (See Chapter 5 for more information). For the purpose of this study, no ballistic feature will be used and, instead, syllables will be considered long or short. Loans with a 4 tone will be considered to be realized with 34 upglide when there is a long vowel (taken from inputs with ultimate stress) and a 43 downglide when there is a short vowel (loans taken from inputs with penultimate stress). Finally, the aspirated laryngeal, which historically has not been used in any adaptations, is currently being used in newer adaptations. Since the aspirated laryngeal is not found in combination with the 4 tone, the most common word-final tone in loanwords is the 4 tone,
it is not clear whether this restriction is becoming less relevant, if the aspirated laryngeal is changing the tone of the words it attaches itself to, or if it is being used in the context of these loans but is not lexically attached to the word (this is further examined in chapter 5).
causative marker t(V). For example, the continuative of ‘cause to explode’ /tukwanu\(^3\)/ becomes /tukwa\(^2\)nu\(^3\)/ and not /*tukwanu\(^1\)/. Although this rule applies only to verbs, traditionally, many loans in Triqui are considered to be complex words and affected by this process. It should be noted that Hollenbach does not give examples of application of F1 and F2 rules on syllables with 1 or 2 tone and does not give a reason for this omission. It would seem that tone lowering is an important part of this process and that words with a lexical 1 or 2 tone that would participate in this process are rare or nonexistent. A review of Hollenbach’s dictionary (Hollenbach 2005a) shows that words with 1 or 2 tone either belong to classes of words that do not participate in tone changing rules, like particles in 24a, or have these tones in the final syllable of a complex word which in turn prohibits them from participating in tone changing rules as in 24b.\(^42\)

(31) Words with 1 or 2 tone

   a. adūh\(^1\) (part.) used phrase finally to give emphasis.
   b. yuve\(^1\) (ad.j) 'hidden'
   c. a\(^3\)dūh\(^1\) (v.) 'crunch'

Table 2.7 outlines the tone changes that occur as a word goes through F2 rules. Complex words (words with lexically linked tone in a non-final syllable) show tone change in the nonfinal syllable, simple words show varied patterns. A simple 5 tone, for example, changes to a 2 tone or a 2 tone with an aspirated vowel; a three tone can change to a 3 tone or a 1 tone. In the case of simple words, there is no predictable pattern

\(^42\) There are some exceptions in the case of verbs like ni\(^3\)kii\(^2\) ‘envelope oneself’ which changes to ni\(^2\)kii\(^3\). There are a handful of verbs that apply this tone change to both syllables.
Table 2.8. Overview of Formative 1 (F1) (Hollenbach 1984: 224)

<table>
<thead>
<tr>
<th></th>
<th>No laryngeal</th>
<th>?</th>
<th>h</th>
<th>!</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>13</td>
<td>13?</td>
<td>13h</td>
<td>13!</td>
</tr>
<tr>
<td>4</td>
<td>NV</td>
<td>NV</td>
<td>X</td>
<td>!</td>
</tr>
<tr>
<td>5</td>
<td>1h</td>
<td>2</td>
<td>2h</td>
<td>X</td>
</tr>
<tr>
<td>31</td>
<td>1</td>
<td>2_31</td>
<td>X</td>
<td>2h</td>
</tr>
<tr>
<td>32</td>
<td>2</td>
<td>2_32</td>
<td>X</td>
<td>2_32h</td>
</tr>
</tbody>
</table>

*NV = does not occur on verb stems
*X = does not occur in this language

Formative 2

Formative 2 (F2) most often involves derivational morphology and has 12 uses in Triqui. Unlike F1, this formant applies to various lexical categories, which makes it more relevant for the data in this study. The following three uses are the ones most likely to affect loanword morphology.

Table 2.9. Overview of Formative 2 (F2) (adapted from Hollenbach 1984: 236)

<table>
<thead>
<tr>
<th></th>
<th>No laryngeal</th>
<th>?</th>
<th>h</th>
<th>!</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>13</td>
<td>13?</td>
<td>13h</td>
<td>13!</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>R</td>
<td>X</td>
<td>1!</td>
</tr>
<tr>
<td>5</td>
<td>1h</td>
<td>5</td>
<td>1h</td>
<td>X</td>
</tr>
<tr>
<td>31</td>
<td>1</td>
<td>X</td>
<td>R</td>
<td>X</td>
</tr>
<tr>
<td>32</td>
<td>2</td>
<td>X</td>
<td>2h</td>
<td>2!</td>
</tr>
</tbody>
</table>

*R = rare, not found with F2
*X = does not occur in this language
There are three uses of Formant 2 that have implications for loanwords:

1. To create denominal adjectives
   a. yāh³ ‘paper’
   b. yāh₁³ ‘papery’

2. To create the possessed form of alienable nouns
   a. agaʔ³ → se³₂ agaʔ¹³ ‘metal of’
   b. rinte⁴ → se³₂ rinde¹ ‘aguardiente of’
   c. miʃte⁴ → se³₂ miʃte⁴ ‘machete of’ (Sp ‘machete’)
   d. miʃte⁴ → se³₂ miʃte¹ ‘machete of’ (Sp ‘machete’)
   e. miʃte⁴ → smiʃte¹ ‘machete of’ (Sp ‘machete’)

3. To create a negative using /nuwe³/ or ‘not’. According to Hollenbach, complex words like cha³ na¹ (a compound word) and loanwords all have a lexically linked 3 or 5 tone that is always replaced by a 2 tone leaving the final syllable unchanged.
   a. tʃa³ na¹ ‘woman’ → nuwe³ tʃa² na¹ ‘not a woman’

2.3.8. Stress in Triqui
Triqui has both tone and stress (Hyman 2007; Hollenbach 1984). Stress in Copala Triqui is found only on the final syllable and it has a variety of phonetic correlates. While stress languages use features such as pitch, intensity, and vowel length to signal metrical prominence; Copala Triqui already has lexical uses for vowel length and tone (they are used contrastively at the lexical level). Stress in Triqui shows up through increased differentiation at the segmental level. Syllables with stress, for example, show contrasts in voicing, vowel length, and nasality and have no restrictions as to what tone can be present.
Syllables with stress also show a minimal length.

While each stressed syllable has tone, it does not seem that each syllable with tone must have stress. Clitics, for example, do not show some of the indicators of stress that lexical items do (G. A. Broadwell, February, 2011, personal communication).

2.3.9 Leftward Nasal Spreading in Triqui

As outlined at the beginning of this language description, final syllables can be either oral or nasal. When final vowels are nasal, leftward nasal spreading can occur. This nasal spreading is the copying of a feature value [+nasal] from the final vowel of the word to a preceding [-consonantal] segment nasalizing all [-consonantal] segments up to, but not including, a vowel that has a lexically linked tone (Hollenbach 1984). Example 127 shows how this works in native words. Although Hollenbach does not address the question of transparency of intervening segments directly, her examples include vowels, the palatal glide, the glottalized palatal glide, and the labialized velar obstruent. Given this pattern, I would expect that the bilabial glide and glottalized bilabial would also participate in this process in a similar manner to the bilabial velar /gw/ as seen in 127b.

(32) Nasal Spreading in Copala Triqui (Hollenbach 1984)

a. yāh³ → [ỹ̃h³] ‘paper’
b. agwì³ → [ag̃wì³] ‘clangs’
c. ayũ:³² → [ỹ̃yũ:³²] ‘is punished’
d. yaʔåh⁵ → [ỹ̃åʔåh⁵] ‘string instrument’
e. aʔåh⁵ → [ỹ̃ʔãh⁵] ‘blows’
Chapter 3

Methods

This study looks at variation at the segmental and prosodic levels in loanword adaptation. The former relies on data taken from the literature and radio recordings, the latter on data taken from the literature and elicited data.

There are two problems often faced by contact linguists as they seek to identify and document variation in progress. First, one must establish a baseline or historical form. Since most examples of documented language focus on an idealized or prescriptive form, it is difficult to get a sense of whether or not the more innovative forms are indeed innovative. For example, Silva-Corvalán (1994) shows that the nonprescriptive use of the copulatives *ser-estar* in American Spanish, often attributed to contact with English, have been present in Spanish long before contact with English occurred. The second problem is that of ‘authentic speech.’ In order to establish variation, it must be established that this form is used differently than in the baseline form of speech. Even more, in order to show contact induced change, it is necessary to demonstrate that this variation approximates the source language patterns of usage over native ones. More formal elicitation sessions and informal recorded interviews are often the closest linguists can get to truly authentic speech.

The data used in this study addresses these two problems in a relatively unique way. Much of what was written on Copala Triqui is done so through a dictionary, syntactic sketch, and popular grammar. While phonetic variation can be found in these publications, it is not their focus, nor is the inclusion of loanwords. One article on Spanish loanwords in Copala Triqui stands out as a prime example of loanword variation at an earlier date and
therefore is appropriate in establishing a baseline. This article (Hollenbach 1973) lists almost 400 loanwords in use by a primarily monolingual population of Triquis living in the Copala Region in the 1960s. Even more, it includes multiple pronunciations of the same loanword, which shows what variation was already in place at the time the study was conducted. While the study does not represent recorded speech, it does represent many of the variants in place as Hollenbach was doing her field research. For data representing modern speech, the current dissertation relies on a corpus of over 600 loanwords extracted from approximately 80 hours of radio data (from XEQIN) recorded between 2009 and 2010. It contains different realizations of loanwords taken from a bilingual radio announcer in San Quintín in Baja California, Mexico.

The segmental analysis of variation in realization of Spanish loanwords in Copala Triqui compares these two data sources. These two sources of data are different in that they represent two very different populations of Triqui speakers, but are also parallel in that they both describe variation in loanword adaptation during two different periods of time.

All words from these data sources were phonetically transcribed, entered into an SPSS database, and coded for the features of this study. In order to keep the data comparable across these two sets, each different pronunciation of the same loanword was recorded as a separate item in the database. These multiple pronunciations are found in both Hollenbach’s article and the radio data. For example, the Spanish word *policía* ‘police’ has been adapted into Triqui as *tanuu*³ ‘soldier’, *tanuu*³ *kolosya*⁴ ‘soldier police’, and *polisya*⁴. The first, because it is a semantic expansion of a native word rather than a loanword, is not included in the database but the second two are included as two separate
entries. Additionally, many words were found in more than one source. In those cases the word was labeled as one lexical entry and linked to each source where that realization occurred.

Since prosodic adaptation of loans follows extremely predictable patterns, no recordings were used in order to establish the tone of loans. Instead, this portion of the data was taken from the elicitation sessions rather than transcriptions from the SPSS database or online recordings of broadcasts. These recordings are used to support findings and identify areas of variation for further study.

These recordings from elicitation sessions were with one bilingual consultant living in the United States using an external microphone and Mobile Pre preamp, which were connected to an HP Pavillion dv6000 laptop computer. Praat voice analysis software was used to analyze the recordings. The next sections describe the data collection in more detail.

3.1. Hollenbach 1973
To date, most of what we know about Copala Triqui comes from Barbara Hollenbach’s fieldwork and research which was conducted in the 1960s and 1970s. In 1973 Hollenbach published an article called ‘La Acculturación Lingüística en Triqui de Copala.’ This article, which represents the use of Spanish loanwords by monolinguals at the time of Hollenbach’s fieldwork, is a list of over 400 lexical borrowings, 30 calques, 50 semantic extensions of native words, and 100 descriptive phrases. This list is divided into semantic categories such as religion, government positions, and food, etc., and often two or three possible pronunciations of the same word were included. Many of these examples represent allophonic variation in place at the time such as optional voicing rules in
nonfinal syllables representing a combination of adaptations that range from most faithful to Spanish input to most faithful to Triqui phonotactice rules. For example, the loan for Easter (Sp 'Pascua') is written /pazikwa/ but also as /bazikwa/, which illustrates how optional voicing rules in non-final syllables affected early loans. In the corpus for this study, each unique form of each separate lexical item was included in the database as a separate entry. This means that for loan for Easter there are two entries from Hollenbach’s. The data from this article was written in Hollenbach’s common orthography which uses ‘Vn’ to signify a nasal vowel and has only one rhotic ‘r’. This means that some differences are easily distinguishable such as voicing and other types of variation are not.

Hollenbach’s orthography, for example, writes a nasal vowel as V+n. This means that the Spanish loan tren or ‘train’ (Sp Tren) would be pronounced /trē:/ lexical items with word-medial nasals such syendo or ‘one hundred’ (Sp ciento could be pronounced /syendo/ or /syē.do/). Since prenasalized segments are common in this language, it is highly unlikely that the later is the appropriate transcription. A second area of underspecification in Hollenbach’s data is in the rhotics where the flap ‘r’ is used for all rhotics. It is very likely that this does not represent allophonic variation that may have already been in place even at that time. The loan for aguardiente, for example is written as both rnde and rinde, the former, according to modern pronunciations could be a flap, a trill or a retroflex sibilant, or even a retroflex trill and the latter could be a trill or a flap. For this reason, any information outside of simple maintenance and deletion of rhotics relies more heavily on data taken from recordings with less emphasis placed on Hollenbach 1973. For nasals it is assumed that word finally Vn represents nasalization of the final vowel and word medially it represents a resyllabified nasal onset rather than a
non-final nasal vowel.

3.2 Radio XEQIN ‘Triquis Somos y en el Valle Andamos’
Radio XEQIN is part of a series of radio channels dedicated to indigenous radio programming and is supported by Comision Nacional para el Desarrollo de los Pueblos Indígenas (National Commission for the Development of the Indigenous Peoples), or CDI, which replaced Instituto Nacional Indigenista (National Indigenous Institute), or INI. XEQIN is one of eight radio stations that started to broadcast over the Internet in 2008. This station offers programming in Mixtec, Zapotec and Triqui. Triquis Somos y en el Valle Andamos, which can be translated to ‘We are Triquis passing through/living in the (San Quintín) Valley’ is a Triqui-Spanish bilingual radio program broadcasted out of San Quintín, Baja California. The radio announcer, Rafael Gómez-Vázquez, is a Triqui in his early 30s from San Miguel, Oaxaca (the same town as one of the Albany consultants). This one-hour show is usually divided into two one-half hour segments. In the first half, Rafael gives a message to the mostly indigenous migrant working audience on issues relevant to Triquis and non-Triquis in the Baja Peninsula such as contaminated water, legal and health matters, and making sure that children have birth certificates and other documents. These messages are almost always translated into Spanish for the non-Triqui audience. In the second half of the program he takes phone calls in Triqui and Spanish where people call in to request music and send messages to family and friends. There is also a short segment in the show dedicated to news stories that is also done in both Triqui and Spanish.

Rafael Gómez died in November 2009, of a heart attack at the radio station. His absence will be felt throughout the community.
There were 611 loanwords and nonce borrowings taken from 80 hours of programming. In cases where there were multiple iterations of the same word, each unique iteration was included as a separate lexical item. For example, when referring to riding a horse, the radio announcer used /wayo⁴/; however, when referring to a popular song called *Caballo Blanco* or ‘White horse’ he used /kwayo⁴ kätzii⁴/. These words were entered as two separate lexical items. Each individual word was saved in context as a smaller 10-15-second WAV file using Audacity; labeled according to Spanish source word, date and time of recording; transcribed phonetically; and added to the SPSS database. Most files were also reviewed with a native Triqui consultant especially examples of verbs, adjectives, and adverbs.

### 3.3 Composition of Database

Table 3.1 gives a breakdown of loanwords found in Hollenbach (1973) and the live radio data. Both show an overwhelming majority of noun adaptation, which is in line with the rest of the literature (Weinreich 1953; Haugen 1950; Appel & Muysken 1987). Despite the fact that one source is written and the other is oral, as well as the fact that these data sources represent a 35-year gap, they are remarkably similar.

Table 3.1. Overview of data by source and part of speech

<table>
<thead>
<tr>
<th>POS</th>
<th>Hollenbach (1973)</th>
<th>Radio XEQIN</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noun</td>
<td>357 (88%)</td>
<td>551 (90%)</td>
<td>908</td>
</tr>
<tr>
<td>Verb</td>
<td>11 (2.7%)</td>
<td>17 (2.7%)</td>
<td>28</td>
</tr>
<tr>
<td>Adj.</td>
<td>27 (6.7%)</td>
<td>29 (4.7%)</td>
<td>56</td>
</tr>
<tr>
<td>Adv.</td>
<td>4 (1%)</td>
<td>7 (1.1%)</td>
<td>11</td>
</tr>
<tr>
<td>Other</td>
<td>5 (1%)</td>
<td>6 (1%)</td>
<td>11</td>
</tr>
<tr>
<td>Prep.</td>
<td>1 (0.2%)</td>
<td>1 (0.2%)</td>
<td>2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>405</td>
<td>611</td>
<td>1,016</td>
</tr>
</tbody>
</table>

---

44 See chapter 1 section 1.3.1 for more on this.
In both Hollenbach (1973) and XEQIN, nouns are the most borrowed category, a fact that is widely attested in the literature (Weinreich 1953; Haugen 1950; Thomason & Kaufman 1988). The presence of verb loans is also unsurprising since Triqui has relatively few verbs and no process for deriving verbs from other categories (Hollenbach 1984). It is also worth noting that even though most verbs are only borrowed in the speech of balanced bilinguals, they are the category of loans most likely to conform to native segmental and especially prosodic rules, even when they represent a case of nonce or online adaptation.

(33) Examples of adaptation of verbs
a. take a stroll (Sp 'pasear') [kaʔáh basya^4] (to go + stroll)
b. greet (Sp 'saludar') [saluda^4] (used in radio broadcasts)

Adjectives are used in the description of people in both sources as well as in the description of farm terms in Hollenbach’s data as seen in example 26 below.

(34) Examples of adjective borrowing (from Hollenbach 1973)
a. Tamed (Sp 'manso') [skuh^5 maso^4] (tamed animal or ox)
b. Lame (Sp 'renco') [rengo^4] (lame, of animals)

The category of ‘other’ includes interjections and discourse markers such as [primo^4] ‘buddy’ from the Spanish primo ‘cousin’ (XEQIN) and [we^4 noh^2] ‘well’ from the Spanish bueno ‘good/well’ (Hollenbach 1973). These are often the easiest categories to borrow since they are relatively unlinked grammatically to the rest of the sentence (Weinreich 1953).

The least borrowed category is prepositions and conjunctions. Triqui has only
borrowed one preposition/subordinate conjunction from Spanish *cuento*, ‘because of’ or ‘on account of’, which can be found in both data sources. It is used to express cause as well as motive (Hollenbach 1973).

(35) Use of Spanish loan

a. Preposition: “My uncle on my father’s side” (Hollenbach 1973:75)

\[\text{Daʔnuʔ}^3 \quad \text{?uhn}^1 \quad \text{gwenda}^4 \quad \text{reh}^{32} \quad \text{?uhn}^1 \quad \text{a}^{32}\]

Uncle:POS 1S Prep father:POS 1S Decl

b. Subordinate clause: “The people dance because they are happy.”

\[\text{Raʔañh}^5 \quad \text{yuvi}^{31} \quad \text{gwenta}^4 \quad \text{niaʔ}^{1-ra4} \quad \text{yuvi}^{31} \quad \text{a}^{32}\]

danceCON people because happy:CON people Decl

3.4. Elicitations

The consultant for elicited data is a bilingual male from Tierra Blanca (21 years old), a Triqui dominant speaker who used Triqui almost exclusively until leaving the Copala region during adolescence. He had limited proficiency in Spanish upon entering the United States.

In order to establish tone levels in the most comparable way, the same set of sentences found in Hollenbach’s dissertation (Hollenbach 1984) were recorded. Each sentence included frames at tone 3 and substitution items that included all of the eight tone patterns following the frame. Twelve repetitions of each sentence were recorded with the Triqui consultant and Praat was used to determine the pitch level at the beginning and end of the underlined syllable in each sentence from 27.
(36) Sentences used for measuring tone (Hollenbach 1984: 75-82)
  a. Tone 1: **Kaka₁** we’3 a32 (The house will leak)
  b. Tone 2: **Kaka₂** we’3 a32 (The house will burn)
  c. Tone 3: **Kara₃** so’3 a32 (He filled)
  d. Tone 4: Achin₃ **yo₄** a32 (The palm basket is lacking/missing)
  e. Tone 5: Achin₃ yo’o₅ a32 (The earth/land is lacking/missing)
  f. Tone 13: **Kara₁₃** so’3 a32 (He will fill)
  g. Tone 31: **Kaka₃₁** we’3 a32 (The house leaked)
  h. Tone 32: **Kaka₃₂** we’3 a32 (The house burned)

The following table is a summary of tone levels found in the consultant for this study.

The tones of this speaker are consistent with Hollenbach’s data although somewhat elevated, which is most likely due to the age of the speaker. There are a few other differences. First, the two lower tones drop more sharply than what Hollenbach found in her dissertation, especially in the case of the 1 tone. After checking various one word and phrasal examples it was determined that this is indeed the pattern for this tone in this speaker. In addition, the 5 tone, instead of starting at the around a 3 tone (about 120 Hz) as in Hollenbach’s data, starts somewhere between a 3 and 4 tone and ends very high.

---

45 He also consistently pronounced [weʔ³] as [beʔ³], which may have a small bearing on the tone because voiced obstruents are often realized with a lower tone.

46 Hollenbach originally hypothesized that the 5 tone starts at the level of a 4 tone and rises to a 5 based on her impression and changed her hypothesis to 3 → 5 after doing spectral analysis for her thesis. It may be that the 5 tone can start anywhere between a 3 and 4 tone without influencing meaning or perception.
Table 3.2 Average fundamental frequency of tone patterns in data sources

<table>
<thead>
<tr>
<th>Hollenbach (1984)</th>
<th>Albany elicitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaker1</td>
<td>Speaker 2</td>
</tr>
<tr>
<td>start</td>
<td>end</td>
</tr>
<tr>
<td>1</td>
<td>90</td>
</tr>
<tr>
<td>2</td>
<td>96</td>
</tr>
<tr>
<td>3</td>
<td>117</td>
</tr>
<tr>
<td>4</td>
<td>111</td>
</tr>
<tr>
<td>5</td>
<td>116</td>
</tr>
<tr>
<td>13</td>
<td>90</td>
</tr>
<tr>
<td>31</td>
<td>123</td>
</tr>
<tr>
<td>32</td>
<td>118</td>
</tr>
</tbody>
</table>

In order to capture comparable tones to those found in the baseline forms outlined above, elicitation sentences for loanwords were also framed by words with a neutral 3 tone as well as a sonorant onset in order to get the least amount of interference possible. In addition, since the possessed form of most nouns shows predictable change in tone, both the possessed and unpossessed forms of each target form were elicited. As in the baseline examples, each loan was elicited 7 times and averaged. The example sentence is given in examples 37 and 38.
(37) Framing sentence used for elicitation of declarative

\[
\text{Yàâ}^5 \text{ me}^3 \] [target word] \ a^{32} \\
That \ COP \ ] [target word] \ Decl \\

\textit{That is a [target word].}

(38) Framing sentence used for possessive

\[
\text{Yàâ}^5 \text{ me}^3 \] [target word] \ Ma^3 \text{ry}^4 \ a^{32} \\
That \ COP \ ] [target word] \ Maria \ Decl \\

\textit{That is Maria’s [target word]}

The possessive marker se\textsuperscript{32} is realized in two ways. At times, it is a separate word and keeps its own tone. Often however, this clitic possessive marker merges with the noun that it modifies to create a contraction. This is especially prevalent in younger speakers. Since no tone is ever dropped in Triqui, the 32 tone of this possessive marker attaches itself to the word it is modifying by dissociating itself from the clitic, moving rightward and attaching itself to the root of the word (Hollenbach 2005) as seen in example 39 below.

(39) Possessive forms that use a contraction\textsuperscript{47}

a. ‘Word of’  /se^{32} na^3 na^1/ \rightarrow /s-na^3 na^1/

b. ‘Banana of’ /se^{32} nato^{32}/ \rightarrow /s-na^3 to^2/

c. ‘Soldier of’ /se^{32} tanuu^{3}/ \rightarrow /s-tanuu^{13}/

\textsuperscript{47} While Hollenbach specifies that the possessive marker attaches to the root of the word, 30b shows that it is attaching itself to the leftmost syllable of the word even if that syllable has no lexical tone and in 30c the tone of the marker seems to disappear. There is obviously still more to be done to determine why this variation is present in her data.
3.5. **Additional Fieldwork**

Although not used systematically in this dissertation, examples taken from additional fieldwork are used in some areas of the dissertation to support and enhance findings. This fieldwork took place in western Mexico in 2008 and Central California in 2009. The fieldwork in western Mexico centered on innovative prosodic features of loanword adaptation in bilingual Triqui speakers, especially balanced bilinguals. The fieldwork in Central California centered on obtaining higher quality recordings of instances of loanwords with the features of this study. Recordings from one monolingual and two bilinguals were used to identify and gain a better understanding of segmental and prosodic variation of a specific list of loans containing some of the features of this study. The same list was recorded with the Albany speaker in this study.
Chapter 4

Segmental Adaptation of Loanwords

4.1. Introduction

The goal of this chapter is to examine variation in lexical adaptation of Spanish loanwords and determine the extent to which increased contact with Spanish is influencing Triqui's phonemic system in the context of loanwords and perhaps even beyond. Table 4.1 below represents all adaptations found in the data sources. From this table, it is clear that there is a great deal of variation in loanword adaptation, which can be seen in segments shared by both languages as well as in adaptation of Spanish phonemes that do not exist as native phonemes in Triqui (/p/, /b/, /t/, /x/, /r/, and /ɲ/). It is also clear that all of these Spanish phonemes are used in the context of Triqui loanwords at some level.

Table 4.1. Overview of all segmental adaptation of Spanish consonants

<table>
<thead>
<tr>
<th>Category</th>
<th>Spanish phoneme</th>
<th>Triqui adaptations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affricates</td>
<td>/tʃ/</td>
<td>[tʃ] [ʃ] [ʒ]</td>
</tr>
<tr>
<td>Fricatives (not including sibilants)</td>
<td>/f/*</td>
<td>[f] [ʰ] [β] [g] [h]</td>
</tr>
<tr>
<td>Obstruents</td>
<td>/p/*</td>
<td>[p] [b] [β] [k] [g]</td>
</tr>
<tr>
<td></td>
<td>/b/*</td>
<td>[b] [β] [k] [g]</td>
</tr>
<tr>
<td></td>
<td>/t/</td>
<td>[t] [d]</td>
</tr>
<tr>
<td></td>
<td>/d/</td>
<td>[d] [t]</td>
</tr>
<tr>
<td></td>
<td>/k/</td>
<td>[k] [g]</td>
</tr>
<tr>
<td></td>
<td>/g/</td>
<td>[g] [k]</td>
</tr>
<tr>
<td>Sibilants (including retroflex sibilants)</td>
<td>/s/</td>
<td>[s] [z] [ʃ]</td>
</tr>
<tr>
<td></td>
<td>/r/*</td>
<td>[ɾ] [ʂ] [ɾ]</td>
</tr>
<tr>
<td></td>
<td>/ɾ/</td>
<td>[ɾ] [ʂ] [ɾ]</td>
</tr>
<tr>
<td>Sonorants (liquids and nasals)</td>
<td>/l/</td>
<td>[l] [n] [ɾ]</td>
</tr>
<tr>
<td></td>
<td>/m/</td>
<td>[m]</td>
</tr>
<tr>
<td></td>
<td>/n/</td>
<td>[n] [ŋ+Ø]</td>
</tr>
<tr>
<td></td>
<td>/p/*</td>
<td>[n] [ŋ+y]</td>
</tr>
</tbody>
</table>

*This sound does not exist in native Triqui phonemic inventory.

At first glance it would seem that the presence of variation, especially the presence of
direct importation of Spanish phonemes, is due to contact with Spanish. This is certainly in accordance with a significant body of literature that links direct importation in indigenous Latin American languages to contact with Spanish. The Spanish trill /ɾ/ has made its way into Nahuatl and Mayan languages (Karttunen 1985); the lateral /l/ and affricate /ʡʃ/ have entered Otomí (Hekking & Bakker 2007); five new segments /θ, ɬʃ, ɬ, r, l/ entered Guaraní (Gómez-Rendón 2007a); the voiced obstruents /b, d, g/ —originally present only as allophones, along with the bilabial fricative /β/ have entered Imbabura Quichua (Gómez-Rendón 2007b); and the lateral /l/ has entered Purepecha, which in turn may be causing this language to start shifting from an r-ɾ distinction to an r-l one (Chamoreau 2007). These studies, however, rarely analyze this importation systematically enough to definitively link the use of these phonemes to contact with Spanish.

Conversely, it may also be that what seems at face value to be purely contact-induced change is actually more related to native internal processes and does not imply language shift. Unlike lexical inventories, phonemic inventories are closed systems and are less likely to accept new members (Van Coetsem 2000). In addition, phoneme substitution is a common and well-documented response to illicit/foreign phonemes in the donor language. Why then should language contact result in phonemic borrowing at all? Some possible answers to this question come from sociolinguistic works where the incorporation of foreign phonemes has been connected to the presence of gaps in the native inventory (Thomason & Kaufman 1988), the languages existing developmental tendencies (Jakobson 1938), ease of integration into the existing system (Martinet 1959), and even the existence of native "latent" allophones (Filipovic 1982). Most recently, there has been a warning against automatically linking variation to contact-induced change.
(Poplack & Levey 2010). This study outlines a method to check whether or not a shift can be attributed to contact at all.

A candidate for contact-induced change in a contact variety is present in the presumed source variety and either 1) absent in the pre-contact or non-contact variety, or 2) if present (e.g., through interlingual coincidence), is not conditioned in the same way as in the source, and 3) can also be shown to parallel in some non-trivial way the behavior of a counterpart feature in the source. (Poplack & Levey 2010: 398)

Following Poplack and Levey (2010) this chapter takes a more cautious look at segmental change. First it examines lexical adaptations of loanwords over time and in specific linguistic contexts to see if variation is indeed an indication of language change. Once change is determined, it then seeks to determine whether this new pattern of usage is a product of contact-induced change or if it a result of internal evolution. In some cases the apparent use of a foreign phoneme does not necessarily indicate direct importation (b and ñ). In other cases the use of a foreign phoneme is most likely connected to a universal tendency (p) or a native process (h and rr).

Section 4.2 examines the importation of voiced and voiceless bilabial obstruents and their part in a possible shift in voicing in the Triqui obstruent system. Section 4.3 examines the role of the Spanish trill in a purely internal language shift involving all sibilants. Section 4.4 examines the importation of the aspirated laryngeal as part of an existing shift that encourages more segmental use of laryngeals. Next, section 4.5 outlines the adaptation of two Spanish phonemes that have resisted importation: /f/ and /ɲ/. The behavior of these two sounds further supports the claim above that importation
is brought about by internal necessity as neither are present in monolingual data and are used only slightly more productively in the bilingual data despite the fact that the palatal nasal already exists in Triqui as an allophone of the palatal glide. Finally section 4.6 ends the chapter with a brief outline of sonorant and sibilant adaptation in onset and coda positions. More systematic treatment of suprasegmental adaptations such as vowel epentheses and the translation of Spanish stress into Triqui tone are covered in Chapter 5.

4.2 Voiced and Voiceless Bilabial Obstruents Adaptation

Spanish has six obstruents: two bilabials /p, b/, two alveolars /t, d/, and two velars /k, g/.\(^{48}\) Triqui, as it has been described up to this point, has voiced and voiceless alveolar and velar obstruents as part of its native inventory. Bilabial obstruents are included in descriptions of this language but are not native to Triqui (Hollenbach 1973, 1977a, 1984). In fact, there is no evidence that bilabial obstruents have ever existed in this language family since Rensch (1976) does not reconstruct bilabial obstruents for Proto-Mixtec (only the labiovelar obstruent kw) nor does Suárez (1973) for Proto-Otomanguean.

\[
\begin{array}{ccc}
\text{Obstruents in Spanish and Triqui} \\
\hline
\text{Spanish} & /b/ & /p/ & /d/ & /t/ & /g/ & /k/ \\
\text{Triqui} & \emptyset & /d/ & /t/ & /g/ & /k/ \\
\end{array}
\]

While bilabials are not reconstructed for Proto-Triqui, the literature does show that Triqui uses both bilabial obstruents in a more limited sense, the voiced bilabial obstruent exists as

\(^{48}\) The voiced obstruents have fricative allophones [β], [ð], and [ɣ] in both Spanish and Triqui (Hollenbach 1984). This is not important in this study since both languages tend to do this in intervocalic position.
an allophone of /W/, which can be pronounced [w], [β], or [b] as in 41a which represents three valid pronunciations of the same word (Hollenbach 1984: 55; DiCanio, June 2009, personal communication) and the voiceless bilabial /p/ is used in a limited number of onomatopoeias as in 41b (Hollenbach 1984: 55). This may imply that the obstruents will be directly imported in the speech of monolinguals and bilinguals alike.

(41) Bilabial obstruents in native words

a. [wih↑] ~ [bih↑] ~ [βih↑] ‘two’
b. [pih⁵] a type of frog, frog call/sound

The next sections focus on the importation of obstruents in the context of Spanish loanwords. More specifically, it explores whether bilabial obstruents can be considered directly imported and the extent to which foreign and native obstruents follow similar patterns of voicing and devoicing.

4.2.1 Bilabial Obstruents /b/ and /p/

As stated above, the bilabial obstruents do not exist as native phonemes in Triqui. Their use, however, has been present in language documentation projects dating back to the turn of the 20th century (Belmar 1890). Table 4.2 outlines the adaptation patterns of bilabial obstruents in the onset of non-final syllables, in the onset of final syllables, and in a nasal + obstruent (N + O) segment. From this chart it is clear that both bilabials are used by monolinguals indicating that they could be borrowed. A closer look at patterns of usage, however, indicates that the voiced bilabial may have been imported very early on while the voiced bilabial has only recently become used systematically as a Triqui obstruent in recent years in the speech of bilinguals. Also apparent is an increased faithfulness to input form in bilingual data. Finally, the lack of velarization in XEQIN data is notable and may
indicate that velarization of bilabials before other rounded segments is no longer productive in the speech of bilinguals (See section 2.3.3 for more on velarization).49

Table 4.2. Adaptation of Spanish bilabial obstruents

<table>
<thead>
<tr>
<th>Hollenbach (1973)</th>
<th>XEQIN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Final syllable onset</td>
</tr>
<tr>
<td>b-b</td>
<td>3</td>
</tr>
<tr>
<td>b-p</td>
<td>0</td>
</tr>
<tr>
<td>b-Ø</td>
<td>3</td>
</tr>
<tr>
<td>b-m</td>
<td>0</td>
</tr>
<tr>
<td>b-g</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Final syllable onset</td>
</tr>
<tr>
<td>b-b</td>
<td>13</td>
</tr>
<tr>
<td>b-p</td>
<td>0</td>
</tr>
<tr>
<td>b-Ø</td>
<td>0</td>
</tr>
<tr>
<td>b-m</td>
<td>0</td>
</tr>
<tr>
<td>b-g</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
</tr>
</tbody>
</table>

The next sections highlight some of the adaptations that fall outside of simple voicing and devoicing.

Deletion

Bilabial obstruents most often delete due to consonant cluster simplification and deletion of unstressed syllables in older loans and loans with high frequency of use. When the first syllable starts with a labial vowel (u, o) there is also a strong tendency to delete in both sources.

(41) Deletion of bilabial (Hollenbach 1973)

a. pound (Sp 'libra') [lira⁴]~[lara⁴]
b. donkey (Sp 'burro') [uro⁴]
c. head (Sp 'cabeza') [gosa⁴]

49 Hollenbach notes a lack of velarization in loanword data (Hollenbach 1973: 85).
(42) Deletion of bilabial (XEQIN)

a. ticket (Sp 'boleto') [oleto[^4]]
b. donkey (Sp 'burro') [uro[^4]]
c. problem (Sp 'problema') [prolema[^4]]
d. substance (Sp ‘substancia’) [sustansya[^4]]

Nasalization

Nasalization of voiced bilabial happens in both data sources; nasalization of a voiceless bilabial only occurs in Hollenbach’s data. There is also evidence that nasalization occurs differently in the data sources. Hollenbach’s data seems to indicate that the bilabial is replaced by the nasal. In XEQIN data it is due to prenasalization of the bilabial. Interestingly, all cases of nasalization happen only in the first syllable and nearly always before an ‘a’.

(43) Examples of nasalization (Hollenbach 1973)

a. boat (Sp 'barco') [mariko[^4]]
b. battery (Sp 'batería') [maderya[^4]]
c. machete case (Sp ‘vaina’) [mana[^4]]
d. Easter (Sp 'Pascua') [mazikwa[^4]]
e. piece (Sp 'pedazo') [madoso[^4]]
f. pick (Sp 'pico') [miko[^4]]
(44) Examples of nasalization (XEQIN)
   a. bank       (Sp ‘banco’)       [mango^4]
   b. vaccine    (Sp ‘vacuna’)      [makuna^4]
   c. band       (Sp ‘banda’)       [mbanta^4]~[mbanda^4]

**Velarization**

Velarization happens in Hollenbach’s data but not in XEQIN radio data. The presence of laryngealization in the loanwords of monolinguals shows that monolinguals apply that specific native rule to these bilabial sounds but bilinguals do not. In XEQIN data and elicitation sessions with bilinguals, this rule does not seem to be active at all as seen in (71). For more on velarization in Triqui see section 2.3.3.

(45) Velarization of bilabials (Hollenbach 1973)
   a. funnel     (Sp ‘embudo’)       [gudo^4]
   b. duck       (Sp ‘pato’)          [gwato^4]
   c. bishop     (Sp ‘obispo’)        [biziko^4] [wiziko^4]

(46) Velarization of bilabials (XEQIN)
   NA

(47) Violation of bilabial rule at word and syllable level (XEQIN)
   a. police     (Sp ‘policía’)       [bolisya^4]
   b. Popo       (proper name)        [popo^4]
   c. point      (Sp ‘punto’)          [pundo^4]

In sum, the voiceless bilabial obstruct seems to have been imported relatively early on in the language—examples are found in publications as far back as Belmar (1890)—and are
in use by bilinguals and monolinguals, although monolinguals show varied adaptation strategies that are no longer present in the adaptation strategies of bilinguals (such as velarization). The voiced bilabial obstruent is likely not yet borrowed but rather imported as the bilabial archiphoneme /W/, which can be pronounced as [b], [w], or [/β]. The data also shows a higher degree of faithfulness to voicing in bilingual data but does not indicate how this increased faithfulness compares to voicing in alveolar and velar obstruents, which is covered in the next two sections. The next sections briefly review adaptation strategies of velar and alveolar obstruents and then compare voicing patterns across obstruents in all three points of articulation.

### 4.2.2 Alveolar and Velar Obstruents in Spanish Loanwords in Triqui

As velar and alveolar obstruents already exist in the native phonemic inventory of Triqui, it is assumed that alveolar and velar obstruents in Spanish loanwords enter as their alveolar and velar counterparts when brought into Triqui through Spanish loans. Once there, they would be subject to Triqui rules of voicing in final syllables, nonfinal syllables, and after nasal consonants. The following sections give a brief description of the types of adaptations that are common in alveolar and velar obstruents.

#### Alveolar Obstruents

Table 4.3 summarizes the adaptation of Spanish alveolar obstruents in Triqui. As predicted, these two groups of sounds are imported as their Triqui counterparts and voice and devoice according to native rules of voicing. It is also clear that, as is the case with bilabials, increased bilingualism is increasing faithfulness to voicing in the context of loanwords.
Table 4.3. Adaptation of Spanish alveolar obstruents

<table>
<thead>
<tr>
<th>Hollenbach 1973</th>
<th>XEQIN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Final</td>
</tr>
<tr>
<td></td>
<td>syllable onset</td>
</tr>
<tr>
<td>t-t</td>
<td>47</td>
</tr>
<tr>
<td>t-d</td>
<td>2</td>
</tr>
<tr>
<td>t-Ø</td>
<td>0</td>
</tr>
<tr>
<td>d-d</td>
<td>16</td>
</tr>
<tr>
<td>d-t</td>
<td>2</td>
</tr>
<tr>
<td>d-Ø</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Final</td>
</tr>
<tr>
<td></td>
<td>syllable onset</td>
</tr>
<tr>
<td>t-t</td>
<td>68</td>
</tr>
<tr>
<td>t-d</td>
<td>1</td>
</tr>
<tr>
<td>t-Ø</td>
<td>0</td>
</tr>
<tr>
<td>d-d</td>
<td>46</td>
</tr>
<tr>
<td>d-t</td>
<td>1</td>
</tr>
<tr>
<td>d-Ø</td>
<td>1</td>
</tr>
</tbody>
</table>

Deletion

In Hollenbach’s data, deletion of /d/ is most often due to consonant cluster simplification and deletion of entire syllables. The one case of final /d/ deletion in the XEQIN radio data was from nonce-borrowing where the suffix ‘ado’ (prone to weakening and deletion in many dialects of Spanish) was deleted.

(48) Deletion of voiced alveolar (Hollenbach 1973)

a. cider (Sp 'sidra') [zara⁴]

b. ‘mother of godchild’ voc (Sp ‘comadre’) [mare⁵]

c. ‘father of godchild’ voc (Sp ‘compadre’) [wah⁵]~[bah⁵]

d. mayor (Sp ‘alcalde’) [regale⁴]

e. glass bottle (Sp ‘vidrio’) [wiro⁴]

f. representative (Sp ‘sindico’) [zi³niko¹]
(49) Deletion of voiced alveolar (XEQIN)
   a. certified (Sp 'certificado') [sertifika^4]

(50) Deletion of voiceless alveolar (Hollenbach 1973)
   a. treasurer (Sp 'tesorero') [zerero^4]
   b. ‘third’ (Sp 'tercio') [reso^4]
   c. Saint Maria (Sp 'Santa María') [zimarya^4]

(51) Deletion of voiceless alveolar (XEQIN)
   NA

Voicing and Devoicing in Final Syllable

Voicing and devoicing occurs most often in nonfinal syllables and after nasals where neutralization is supposed to happen in Triqui. There were, however, a few instances of voicing and devoicing in final syllables. One was caused by vowel epenthesis that moved the obstruent to a nonfinal syllable (thus giving license to voicing). The others are due to age of loans and frequency of use associated with things like religious artifacts, town names, and fabrics/clothing.

(52) Voicing of alveolar in final syllable (Hollenbach 1973)
   a. Lizard River (Sp 'Río Lagarto') [lagardo^4]
   b. train (Sp 'tren') [dariin^4]
(53) Voicing of alveolar in final syllable (XEQIN)
   a. Lizard River (Sp 'Río Lagarto')  [lagardo⁴]

(54) Devoicing of alveolar in final syllable (Hollenbach 1973)
   a. Nativity (Sp 'Natividad')       [dita⁴] ~ [ndita⁴]
   b. shirt (Sp 'algodón')            [goto:⁴]

(55) Devoicing of alveolar in final syllable (XEQIN)
   a. shirt (Sp 'algodón')            [koto:⁴]

In sum, the alveolar obstruents are brought in as their counterparts with little trouble. They are most faithful to input in final syllables and tend to voice and devoice in nonfinal syllables and after nasals. Variation found between data sources due to native voicing rules may indicate a possible shift toward differentiation of voicing in non-final syllables, a historically neutral context.

**Velar Obstruents**
Table 4.4 summarizes the adaptation patterns of velar obstruents in the data. From this table it is clear that, like the alveolar obstruents, there is variation in voicing and the velar obstruents are much more faithful to input form in the XEQIN radio data than in Hollenbach’s data.
Table 4.4. Adaptation of Spanish velar obstruents

Hollenbach (1973)  

<table>
<thead>
<tr>
<th></th>
<th>Final syllable onset</th>
<th>Nonfinal syllable onset</th>
<th>N + O sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>k-k</td>
<td>23</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>k-g</td>
<td>4</td>
<td>52</td>
<td>2</td>
</tr>
<tr>
<td>k-Ø</td>
<td>2</td>
<td>26</td>
<td>0</td>
</tr>
<tr>
<td>g-g</td>
<td>8</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>g-k</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>g-Ø</td>
<td>0</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Hollenbach (1973)</th>
<th>XEQIN Radio</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. mare</td>
<td>(Sp ‘yegua’)</td>
<td>[yawa₄]</td>
</tr>
<tr>
<td>b. story</td>
<td>(Sp ‘cuento’)</td>
<td>[wendo₄]</td>
</tr>
<tr>
<td>c. lettuce</td>
<td>(Sp ‘lechuga’)</td>
<td>[laʒugwa₄]</td>
</tr>
</tbody>
</table>

The primary difference between the velars and alveolars is the presence of the labiovelar consonant characterized by free variation between kw, gw, hw, and w in some contexts.

(56) Variation of velars in contact with labiovelar glide (w ~ gw ~ hw) Hollenbach (1973)

a. mare       (Sp ‘yegua’)      [yawa₄]

b. story      (Sp ‘cuento’)     [wendo₄]

c. lettuce    (Sp ‘lechuga’)    [laʒugwa₄]

(57) Variation of velars in contact with labiovelar glide (w ~ gw ~ hw) XEQIN

a. story      (Sp ‘cuento’)     [wendo₄]

b. daycare    (Sp ‘guardería’)  [hwaderi₃a₁]

c. White/rich man (Sp ‘güero’)  [wero₄]

Deletion of Velar Obstruents

As with the alveolar obstruents, deletion happens most often in consonant clusters and as...
the result of syllable deletion in Hollenbach’s data. Deletion is rare in the radio data and occurs in older, high-frequency words.

(58) Simplification of consonant clusters

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>cross</td>
<td>(Sp 'cruz')</td>
<td>[ru³se¹]</td>
</tr>
<tr>
<td>b.</td>
<td>doctor</td>
<td>(Sp 'doctor')</td>
<td>[dotoo⁴]</td>
</tr>
<tr>
<td>c.</td>
<td>Christ</td>
<td>(Sp 'Cristo')</td>
<td>[rizito⁴]</td>
</tr>
<tr>
<td>d.</td>
<td>pomegranate</td>
<td>(Sp 'granada')</td>
<td>[ranada⁴]</td>
</tr>
<tr>
<td>e.</td>
<td>doctor</td>
<td>(Sp 'doctor')</td>
<td>[dotoo⁴]</td>
</tr>
</tbody>
</table>

(59) Deletion due to syllable truncation (Hollenbach 1973)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>commission</td>
<td>(Sp 'commisión')</td>
<td>[wisyũũ⁴]</td>
</tr>
<tr>
<td>b.</td>
<td>leader</td>
<td>(Sp 'capitán')</td>
<td>[wita₄]</td>
</tr>
<tr>
<td>c.</td>
<td>aguardiente</td>
<td>(a kind of drink)</td>
<td>[rinde⁴]</td>
</tr>
<tr>
<td>d.</td>
<td>government</td>
<td>(Sp 'gobierno')</td>
<td>[wiyarino⁴]</td>
</tr>
<tr>
<td>e.</td>
<td>aguardiente</td>
<td></td>
<td>[rnde⁴]</td>
</tr>
</tbody>
</table>

In sum, variation of velar obstruents is similar to that of the alveolar obstruents. They are most faithful to input in final syllables and tend to voice and devoice in nonfinal syllables and after nasals. Examples of deletion are most often due to simplification of consonant clusters and syllable deletion in older loans and loans with high frequency of use. When the velar precedes the labiovelar semiconsonant in Spanish, it is often interpreted as a labiovelar consonant with various possible pronunciations.
4.2.3 Voicing across Velar, Alveolar, and Bilabial Obstruents
Triqui obstruents follow specific patterns of voicing in final syllables, nonfinal syllables, and in contact with a nasal. The importation of Spanish bilabial obstruents provides an interesting test case as little is understood about the behavior of foreign phonemes once they are incorporated into everyday language via loanwords (see [Sayahi 2007] for one example). Do foreign phonemes behave in the same way as native ones and how are the two data sources different in regards to voicing?

Voicing in N + O and Nonfinal Syllables
As seen above, final syllables show a high rate of faithfulness to input form and for that reason this section focuses on nasal + obstruent (N + O) sequences and nonfinal syllables. Table 4.5 gives an overview of nonfaithful adaptation of obstruents in focusing on voicing and devoicing in the context where voicing and devoicing is warranted in Triqui: nonfinal syllables and in a nasal + obstruent sequence. “Bilabial voice” means that a Spanish ‘p’ was adapted as a voiced bilabial; “bilabial devoice” means that a Spanish ‘b’ was adapted as a Triqui voiceless bilabial in that particular utterance. From this table, two things become immediately apparent. First, it is clear that bilingualism has an effect in voicing patterns in nonfinal syllables at all places of articulation. Hollenbach’s data ranges from 65% to 75% while the radio data ranges from 8% to 19%. As rates of bilingualism increase and more words enter the lexicon with this differentiation, it is likely that this distinction will become more commonplace and with increased contact could even spread to the native lexicon. The second piece of 50 Hollenbach (1973: 65-66) mentions that Spanish is reinforcing oppositions in sounds that have been emerging for a while but does not go into any detail about which sounds
information that can be gleaned from this table is that obstruents in these two contexts, nonfinal syllable onsets and N + Os are being treated differently. Obstruents in nonfinal syllables are showing drastic reduction in voicing but in N + O segments voicing has remained relatively stable. This indicates that the two are actually separate processes. In nonfinal syllables obstruents pass through voicing and occasional devoicing while N + O sequences are a true case of neutralization.\textsuperscript{51}

Table 4.5. Obstruent voicing according to position in word

<table>
<thead>
<tr>
<th></th>
<th>Hollenbach (1973)</th>
<th>XEQIN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nonfinal</td>
<td>N+O</td>
</tr>
<tr>
<td>Bilabial voice</td>
<td>31/42    (74%)</td>
<td>6/9** (67%)</td>
</tr>
<tr>
<td>Bilabial devoice</td>
<td>0/39 (0%)</td>
<td>0/1 (0%)</td>
</tr>
<tr>
<td>Velar voice</td>
<td>53/82 (65%)</td>
<td>2/3* (67%)</td>
</tr>
<tr>
<td>Velar devoice</td>
<td>0/28 (0%)</td>
<td>0/3 (0%)</td>
</tr>
<tr>
<td>Alveolar voice</td>
<td>30/40 (75%)</td>
<td>31/38** (82%)</td>
</tr>
<tr>
<td>Alveolar devoice</td>
<td>1/18 (5.6%)</td>
<td>0/4 (0%)</td>
</tr>
</tbody>
</table>

*Significant at p=.05
**Significant at p=.01

In sum, Triqui adapts Spanish velar and alveolar obstruents as their corresponding native obstruent according to place of articulation. Once this happens, it can apply native rules of or how.

\textsuperscript{51} It is difficult to prove whether or not an N + O segment can be considered a prenasalized segment or a nasal-obstruent sequence. (See Downing [2005] for more on this). I am not setting out to prove this point either way but what is clear is that these segments behave differently than the other obstruents as far as voicing is concerned.
voicing. The N + O segments are neutralized at similar rates in both sources of data while all obstruents in non-final syllables are less likely to voice as bilingualism increases. In final syllables, there is an almost exceptionless faithfulness to the voicing of the input form\(^{52}\) while in nonfinal increased bilingualism has encouraged more faithfulness to Spanish input form in this otherwise variable position. In addition, it is notable that devoicing, while rare in the data set, is categorically missing in bilabials indicating that voiced and voiceless bilabials have been imported differently; the voiceless shows signs of direct importation while the voiced shows signs of assimilation to the native /W/, which in turn can have an obstruent realization. The next sections explore the possible effect of two sociolinguistic factors, in particular linguistic consciousness and increased level of bilingualism/balanced bilingualism in elicitation sessions in Albany and Central California.

**Bilabial Obstruents and Judgments of Acceptability**

This section explores the possible role of carefulness of speech in the varying rates of voicing and categorical lack of devoicing of bilabials in Spanish loanwords in Triqui. Judgments of acceptability in elicited data with an Albany native speaker consultant from San Miguel Copala (who is from the same town as the radio announcer for the Radio XEQIN data) show that bilabials are treated differently from velar and alveolar bilabials. When asked to produce Spanish loanwords containing bilabials this speaker was much more likely to remain faithful to the bilabial obstruent than was the case with alveolar and velar obstruents. Even more, the same Albany consultant—a Triqui dominant but very

\(^{52}\) The one case of devoicing of velar obstruent occurred in a final syllable so it does not show up in this part of the analysis (yugo ‘yoke for plow’ \(\rightarrow\) [ya.kõ\(^4\)]).
proficient bilingual—when asked to judge the acceptability of different pronunciations of loanwords, accepted the voiced and devoiced forms of loanwords with velar or alveolar obstruents but never accepted voicing and devoicing in bilabial even when produced in his own speech. Out of 232 words elicited, voicing and devoicing in alveolars and velars were common and comparable to Hollenbach (1973) and XEQIN but bilabials were not. In fact, no examples of devoiced bilabials and only four examples of voiced bilabials were produced.

Table 4.6. Voicing and devoicing in elicitation sessions with an older bilingual

<table>
<thead>
<tr>
<th></th>
<th>Bilabial voice N=81</th>
<th>Bilabial devoice N=0</th>
<th>Velar voice N=106</th>
<th>Velar devoice N=12</th>
<th>Alveolar voice N=111</th>
<th>Alveolar devoice N=25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albany consult N=232</td>
<td>4/28 14%</td>
<td>0/43 0%</td>
<td>26/78 33.3%</td>
<td>2/24 8.3%</td>
<td>25/93 26.8%</td>
<td>7/43 16.2%</td>
</tr>
</tbody>
</table>

This judgement of "correctness" is especially interesting when compared to elicitations taken in Mexico with bilingual speakers. For example, the voiced version of the loan for parakeet, /ʃ tah\textsuperscript{32} periko\textsuperscript{4}/ $\rightarrow$ [ʃ tah\textsuperscript{32} beriko\textsuperscript{4}] (bird parakeet), is categorically unacceptable for the Albany consultant even though elicitation sessions with Triqui monolinguals and semi-speakers of Spanish produce this term as both /ʃ tah\textsuperscript{32} periko\textsuperscript{4}/ and /ʃ tah\textsuperscript{32} beriko\textsuperscript{4}/.

In sum, the bilabial obstruents are subject to native rules, but only partially. The peripheral role of loanwords, and borrowed phonemes, and increased consciousness may be playing a significant role in how bilabials are realized in Triqui. While this lack of devoicing may be evidence that these borrowed phonemes do not behave like their alveolar and velar counterparts, it could indicate that the /p/ was directly imported very early on but the /b/ has traditionally patterned as a glide, which has an obstruent
allophone. If the Spanish bilabial obstruent is being treated as a glide in Triqui, then it would not need to participate in rules of voicing that apply to obstruents and sibilants.

The next section covers a phenomenon not found in the data set but in elicitation sessions with bilinguals in Central California. It is the optional devoicing of certain consonants after the aspirated laryngeal coda. Evidence from younger speakers may indicate that the importation of bilabial obstruents may be much more prevalent in younger generations and may be part of a more widespread shift in labials in this language.

**Newer Adaptations of Bilabial Obstruents**

Although the data for this study does not show any bilabial devoicing, in very recent elicitations there have been a few examples of bilabial devoicing in the speech of younger balanced bilinguals. In this example the Spanish loan for violin (Sp 'violín') in Triqui, as shown in example 60, was produced with the voiceless bilabial rather than the voiced bilabial or the bilabial glide. Interestingly enough, Triqui dominant speakers most often reinterpret the word initial bilabial of this same loan as the Triqui bilabial glide.

(60) Example of bilabial devoicing of the word violin (Sp 'violín')

<table>
<thead>
<tr>
<th>Young speaker</th>
<th>yaʔah⁵</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older speakers</td>
<td>yaʔah⁵</td>
</tr>
<tr>
<td>Gloss</td>
<td>string-instr violin</td>
</tr>
</tbody>
</table>

53 This fortis-like pronunciation of word-initial onsets was also found in sibilants, for example, in ya’anh⁵ ra’a³ or ‘flashlight’ (lit 'fire hand') the rhotic was often pronounced with a trill.
Triqui has an optional tensing rule that applies to sibilants and obstruents that follow an aspirated laryngeal coda (B. Hollenbach, July 2009, personal communication). When an aspirated laryngeal coda is followed by an obstruent or sibilant, Triqui tends to produce a fortis variant rather than a lenis (p, t, k, s, r̩ rather than b, d, g, z, r). The spectrogram below is of the Triqui word for boot, which is a hybrid loan incorporating the native word for shoe, /kanuh₁³/ and the Spanish loan for boot /bota⁴/. When pronounced in rapid speech, the voiced bilabial is often devoiced as seen below.⁵⁴

Figure 4.1. /kanuj₁³ bota⁴/ boot (literally shoe boot) as spoken by a balanced bilingual

This fortis pronunciation of the bilabial may be preliminary evidence of a jump in

⁵⁴ Note that there are two things happening here. 1) The tense/voiceless obstruent in produced. 2) There is a lack of velarization. Most monolinguals would pronounce this as kota⁴ orgota⁴.
loanword adaptation between younger and older speakers. While the older speakers, even highly proficient bilinguals, may still map the Spanish voiced bilabials onto the Triqui glide, which can then have a bilabial realization, the younger speakers, who grow up with two languages from the very beginning, may map this sound directly onto the borrowed voiced bilabial and thus have license to devoice it.

(61) Projected shift in bilabial obstruents in Triqui

<table>
<thead>
<tr>
<th></th>
<th>Velar obstruents</th>
<th>Alveolar obstruents</th>
<th>Bilabial obstruents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>/k/ /g/</td>
<td>/t/ /d/</td>
<td>/p/ /B/*</td>
</tr>
<tr>
<td>Now/future</td>
<td>/k/ /g/</td>
<td>/t/ /d/</td>
<td>/p/ /b/</td>
</tr>
</tbody>
</table>

*Representing an archiphoneme with voiced bilabial pronunciation, not necessarily an obstruent.

This section has examined the incorporation of two non-native phonemes in the context of Triqui loanwords, /b/ and /p/, and compared voicing patterns to those of native velar and alveolar obstruents. The primary data for this study does not demonstrate that the voiceless bilabial is currently patterning after Spanish in a non-trivial way and can be considered imported. The voiced bilabial obstruent did exist in the pre-contact variety as a possible pronunciation of the Triqui /W/ and does not currently pattern after the Spanish /b/ in a non-trivial way. It is only in the speech of balanced bilinguals living in the United States that we see a possible contact-induced shift in the bilabials of Triqui. If this is true, it may affect non-loanwords like wii³ ‘house’ and chuwee³ ‘dog’ are consistently pronounced as ‘bii³’ and ‘chubee³’ by the consultant 3 of this study who is a younger bilingual speaker. More data will need to be collected from young balanced-bilingual speakers to verify this claim. There is a distinct possibility that the bilabial system of
Triqui, a bilabial glide with multiple realizations, could be replaced by the Spanish dual bilabial system very soon.

### 4.3 Incorporation of Spanish Trill through Internally Motivated Shift

The importation of the Spanish trill must be understood in the context of Triqui’s sibilant system. Spanish has one voiceless sibilant, the /s/; Triqui, in turn, has a more complex system of sibilants including a voiced and voiceless alveolar /s/ /z/, a voiced and voiceless palatal /ʃ/ /ʒ/, and a voiced and voiceless retroflex /r/ /ʂ/.

Although the ‘r’ can have a sonorant-like pronunciation in Triqui, it is a sibilant and even participates in rules that only affect sibilants (see chapter 2 for a detailed description of sibilants and rules affecting sibilants).

The next two sections outline the behavior of Spanish sibilants and rhotics in Spanish loanwords in Triqui. In section 4.3.1 the behavior of the alveolar sibilant /s/ is examined. The adaptation of this sound is somewhat unsurprising given the fact that the two languages have a similar alveolar sibilant. The primary source of variation is through the application of Triqui voicing rules, much like the alveolar and velar obstruents, although some innovative alternatives can be found in the monolingual data.

Since the trill /ɾ/ is not a native sound to Triqui, this section also explores the possible importation of this sound in the context of loanwords and its implications for the phonemic inventory of Triqui and the role of an internally motivated shift in overall shifts in the pronunciation of rhotics and sibilants in loanwords as well as native lexical

---

55 I follow Hollenbach in referring to sibilants as tense and lax. Voiced and voiceless is appropriate in the case of alveolar and palatal sibilants but not in the case of the rhotics.
items.\textsuperscript{56} The stronger presence of vowel deletion between sibilants and obstruents in bilingual data also comes with a fortis pronunciation. This has a somewhat interesting consequence for the rhotics which do not seem to have a precedent for this, at least as it has been presented in the literature up to this point.

\textbf{4.3.1. Adaptation of Voiceless Sibilant /s/}
The Spanish voiceless sibilant is adapted as the tense /s/ in Triqui which is acoustically the most similar to this Spanish phoneme. Triqui differentiates between voiced and voiceless sibilants in final syllables and neutralizes for voicing in nonfinal syllables. It is also a strict open-syllable language, which means that no native words with sibilant coda exist in Triqui.

Table 4.7 is a preliminary breakdown of /s/ adaptation in final syllable onset, nonfinal syllable onset, and after a nasal. Note that position in the word is determined by the Spanish input and not the adapted form in Triqui. In some cases, post-sibilant vowel epenthesis moves a sibilant from final syllable in Spanish to a nonfinal syllable in Triqui (i.e., \textit{Sp}: /pa.skwa/ \textrarrow{} \textit{Tr}: /ba.zi.kwa\textsuperscript{4}/). From this chart we can see that there are examples of maintenance, voicing, affrication, and epenthesis in the data although voicing and epenthesis seem to be more common in monolingual data while faithfulness to voicing and place are more common in bilingual data. We also see hints of the effect that bilingualism is having on the adaptation of this sound. Bilinguals are less likely to delete, to voice and

\textsuperscript{56} This shift has happened over the course of a few generations. Monolinguals in the 1960s were epenthesizing sibilant + obstruent clusters word medially and now the reverse is true and sibilant + obstruent (or nasal) consonant clusters are being created through vowel deletion.
to insert and epenthetic vowel when the ‘s’ is in coda position, word internally, and word finally.

Table 4.7. Adaptation of sibilants

<table>
<thead>
<tr>
<th>Hollenbach 1973</th>
<th>XEQIN Radio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Final syllable onset</td>
</tr>
<tr>
<td>s-s</td>
<td>36</td>
</tr>
<tr>
<td>s-z</td>
<td>7</td>
</tr>
<tr>
<td>s-Ø</td>
<td>1</td>
</tr>
<tr>
<td>zh</td>
<td>4</td>
</tr>
</tbody>
</table>

**Nonfinal Syllable Onset**

In nonfinal syllables the behavior of the voiceless sibilant is in line with what we expect for a sound in this neutral position. In monolingual data, voicing is abundant, and in bilingual data, there is an increasing tendency toward maintenance. In this position, deletion is rare and most often involves the loss of a syllable over time.

(62) Deletion in nonfinal syllables

a. Alternate (Sp ‘suplente’) [lende⁴]

b. Sacrament (Sp ‘sacramento’) [rumendo⁴]

There are also examples of palatization in the data set. This happens most often when the sibilant is before another consonant. Many of these loans today are pronounced with the voiceless palatal, for example, ‘chair’ and ‘Castellano’ are both pronounced [ʃla⁴]. The only example of this sound found in the radio data was due to assimilation with the

---

57 Hollenbach documents other words that more obviously come from Nahuatl such as cacaste, which is pronounced [ka.ʃte⁴] from Nahualt /ka.ʃte/.
following affricate.

(63) Presence of palatal sibilant in loans (Hollenbach 1973)

a. Castillian (Sp ‘Castellano’) [3ila$^4$]
b. religious figure (Sp ‘Sacristan’) [3ita$^4$]
c. chair (Sp ‘silla’) [3ila$^4$]

(64) Presence of palatal sibilant in loans (XEQIN)

a. San Andrés Chicahuaxtla (town) [Sanandeʃ$^3$-tʃikawksla$^4$]

As mentioned above, epenthesis in VsC occurs only in the monolingual data. Since most consonant clusters are found in this position, we can see clearly the transition from epenthesis in monolingual data to maintenance of the sibilant + obstruent consonant cluster in bilingual data. In addition, the sibilant is always realized as the voiceless in consonant clusters. This voiceless pronunciation is unsurprising since the rule that creates this vowel deletion between sibilants and obstruents/nasals also enforces a tense pronunciation of this sound in all sibilants, including the ‘r’ which is most often pronounced ş in this position.

(65) Non-final syllables (not part of CC)

a. San Miguel (a town) [zamiguee$^4$] (XEQIN)
b. Panteon (Sp ‘santo’) [zando$^4$] (Hollenbach 1973 & XEQIN)
(66) CsV clusters

a. apple (Sp 'manzana') [mansana⁴] (Hollenbach 1973)

(67) In VsC consonant clusters

a. hospital (Sp 'hospital') [ospita⁴] (XEQIN Radio)

Final Syllables
The behavior of the voiceless alveolar sibilant also provides few surprises. In XEQIN data, it is faithful to input 100% of the time. In Hollenbach’s data, there are instances of palatization and voicing. Voicing in this context happens most often as a result of vowel epenthesis in VsC as seen in example 68.

(68) Voicing in final syllables due to vowel epenthesis

a. Easter (Sp 'Pascua') \(\rightarrow\) [mazikwa⁴] ~ [gwazikwa⁴] ~ [bazikwa⁴]

Two cases of voicing in this context are more likely due to influence of Spanish spelling in Hollenbach’s transcription of the data 69a,b and the other is due to vowel deletion and regressive assimilation of voicing 69c.

(69) Voicing in final syllable without epenthesis

a. March (Sp 'marzo') [marizo⁴] (Hollenbach 1973)

b. mug (Sp 'taza') [daza⁴] (Hollenbach 1973)

c. professor (Sp 'profesor') [provzor⁴] (XEQIN)

As mentioned above, many examples of epenthesis in the final syllable move the sibilant to a nonfinal syllable which in turn triggers voicing. Loans whose likely origin is Nahuatl

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58 Although they come exclusively from loanwords, CsV clusters are recognized as a possible consonant cluster relatively early on (Hollenbach 1977, 1984).
often show palatization as seen in 68. This palatization is completely absent in later documentation of the language and in my elicitations. This can be seen in ‘impuesto’ (below), which has shown a typical progression of adaptation from voiced palatal with epenthesis [ba.zi.to\(^4\)] (Hollenbach 1973) to voiceless palatal due to nonfinal vowel deletion [pe.to\(^4\)] (Hollenbach 2005a) and finally back to the voiceless alveolar sibilant [pwe.to\(^4\)] in my elicitation sessions with bilingual speakers in Albany.

(70) Palatization & epenthesis in final syllables (Hollenbach 1973)

a. Christ (Sp ‘Cristo’) [ri.zi.to\(^4\)]

b. tax (Sp ‘impuesto’) [ba.zi.to\(^4\)]

c. teacher (Sp ‘maestro’) [me.zi.to\(^4\)]

d. skeleton (Sp ‘cacaste’) [ga.zi.to\(^4\)]

In sum, the Spanish voiceless sibilant is adapted as the tense-voiceless /s/ in Triqui. In final syllables, before consonants and when it takes part in word-final epenthesis it almost always takes the voiceless pronunciation and in nonfinal position it is optionally voiced. While there are also some examples of /s/ → /ʃ/ and /s/ → /ʒ/, this is not considered to be a productive adaptation strategy in modern Triqui. In inputs with sibilant + stop syllable onsets, there has been a shift from vowel epenthesis in monolingual data to almost complete maintenance in bilingual data. Although faithfulness to input form can partially explain why this has happened, an internal shift in Triqui caused by unstressed vowel deletion has made sibilant + obstruent onsets very common and even preferred (see section 4.3.3 for more detailed descriptions of this process). Finally, the increased tendency to delete nonfinal, unstressed vowels creates consonant clusters that encourage a voiceless pronunciation of the sibilant.
4.3.2. Adaptation of Rhotics
While the alveolar sibilant ‘s’ seems to have a straightforward adaptation pattern as it enters Triqui through loanwords (disregarding epenthesis and voicing maintenance through deletion of nonfinal vowels for the time being), the adaptation of Spanish rhotics into Triqui is a little more complicated. Instead of a one-to-one mapping of phonemes, we now have the mapping of two sonorant rhotics in allophonic distribution in Spanish (one tap and one trill) onto two Triqui sibilant rhotics (one flap and one retroflex), which have their own allophonic distribution in Triqui. In addition, it is not clear when Triqui shifted to a two-rhotic system since Hollenbach only includes the flap as a phoneme (sometimes referring to the retroflex as an allophone of the flap). Before analyzing the realization of rhotics in the data, this section will first describe the rhotic systems of Spanish and Triqui.

As seen in Figure 4.2 (below), Spanish has two separate ‘r’ phonemes: the trill /ɾ/ and flap /ɾ/. In standard Spanish, the trill is always pronounced as such and the flap is pronounced as a flap word finally, between vowels and after a stop, and as a trill word—initially and after a liquid or nasal.

Figure 4.2. Spanish sonorant rhotic system
(71) /ɾ/ = /d/ intervocally, word finally and after stops
   a. caro [ka.ro] ‘expensive’
   b. comprar [kom.prar] ‘to buy’
   c. tren [tren] ‘train’

(72) /ɾ/ = [r] word initially and after liquids and nasals
   a. rosa [ro.sa] ‘rose’
   b. honrar [on.rar] ‘to honor’

(73) Minimal pairs
   a. carro [ka.ro] ‘car’
   b. caro [ka.ro] ‘expensive’

Triqui also has two rhotics, /ɾ/ and /ʂ/, that fit into an overall tense lax opposition of sibilants as seen in example Table 4.8 although it is hypothesized that the retroflex sibilant /ʂ/ has only recently been introduced as a phoneme in this language since is not reconstructed in Proto-Triqui, nor is it described in the Chicahuaxtla (Good 1979) or Itunyoso (DiCanio 2008) dialects. The sound most likely came about when the retroflex affricate and the flap started to come into contact with the palatal sibilant /ʃ/ through unstressed vowel deletion (Matsukawa 2007).

(74) Examples of /ʂ/ creation through deletion
   a. širiki → /ši³kih¹³/ ‘a type of frog’
b. ŧsujoh \(\rightarrow /\sigma h^32/\) ‘pants’

In more recent publications, Hollenbach describes the ‘r’ as having two allophones. It is pronounced as a flap between vowels and in other positions it is pronounced "with the tip of the tongue rolled back as some pronounce the ‘rr’ in Spanish" (Hollenbach 2005b: 10 translated by author).

Table 4.8 Sibilants in Hollenbach & Hollenbach (1975)

<table>
<thead>
<tr>
<th></th>
<th>Alveolar</th>
<th>Palatal</th>
<th>Retroflex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tense</td>
<td>s</td>
<td>(\tilde{s})</td>
<td>(\tilde{\sigma})</td>
</tr>
<tr>
<td>Lax</td>
<td>z</td>
<td>3</td>
<td>r</td>
</tr>
</tbody>
</table>

Although both bilingual and monolingual Triquis have little trouble pronouncing the flap /\(r/\) or the vibrant trill /rr/ in loanwords, it is unclear whether Hollenbach’s reference to ‘some [people]’ makes reference to a trill similar to the voiceless sibilant trill of her earlier description or the Spanish sonorant trill. In her dissertation she gives a little more detail stating that "[t]he two retroflex sibilants have liquid allophones: the first varies freely between a tense sibilant /\(\tilde{\sigma}/\) and a voiceless apical trill; and r is a flap, rather than a lax sibilant, between vowels, following a stop, and optionally elsewhere" (Hollenbach 1984: 57).

Figure 4.3 Triqui sibilant rhotic system

\[
\begin{align*}
/\sigma/ & \rightarrow [\tilde{\sigma}]-[r] \\
/\tilde{\sigma}/ & \rightarrow [\tilde{\sigma}]-[r]
\end{align*}
\]

Finally, it should be noted that, depending on the speaker, there is one minimal pair to be
considered intervocally as can be seen in 78. Hollenbach, however, considers the rhotic in this example to be in free variation between the flap and retroflex sibilant (Hollenbach 1977a: 40) Perhaps this variation is dialect-dependent.

(75) Free variation of /ʂ/
   a. şoh ‘pants’ [şoh] or [ɾoh]

(76) Pronounced as flap between vowels and after a stop\(^59\)
   a. maree\(^13\) ‘red’ [ma.re:13]
   b. tren ‘train’ [tɾẽ4]

(77) Possible pronunciation of ‘r’ in other positions
   a. Rumii ‘ball’ [rumii], [ʂumii], or [ɾumii]

(78) Minimal pairs found in some dialects
   a. maşeé\(^31\) ‘green’
   b. maree\(^13\) ‘red’

Given the descriptions above, it is expected that Triqui will adapt the Spanish rhotics into

\(^59\) Obstruent + ‘r’ consonant clusters are only found in loanwords. The only example of this occurrence in a native word is found in the Chicahuaxtla version of father (possessed) which is drej (Good 1979). This word has been claimed to be a loan taken from ‘padre’ in colonial times.
the Triqui system. First, the flap, intervocally and after stops, should show a high rate of faithfulness to flap. Second, the intervocalic trill may simplify to the flap or it will show a great deal of variation between [r]-[ʂ]-[ʃ] or even [rr]-[ʂ]-[ʃ]. Third, word initially, there should be a greater degree of variation since Spanish requires a trill and Triqui does not require any one sound. I expect to see all four sounds in this position: r, r, ʂ, and r. Finally, in coda position, there should be a fair degree of deletion. However, since maintenance is also common in sibilants there should be some maintenance in this position especially in monosyllabic words and words where the final syllable is stressed. This last context should also produce word-final vowel epenthesis.

Table 4.9 outlines the various pronunciations of ‘r’ in bilingual and monolingual speech divided by linguistic context. From this table it is immediately apparent that the rhotics are being treated differently in each data source.

However, shifts in the rhotics and nonfinal vowel deletion are expected to play a role here as they did with the voiceless sibilant.

Division of data by presence of rhotic in final syllables, nonfinal syllables, and coda position does not make much sense for the rhotic since descriptions of this sound up to this point have pointed out linguistic context as more important. For this reason, the analysis has been adjusted to take into account linguistic context rather than syllable position. The retroflex sibilant and voiceless trill are both represented by /ʂ/ from here on out. Adaptation of word-final rhotics is shown here but is covered in more detail in section ??.

The transcription methods of Hollenbach (1973) limit the ability to fully compare these
Table 4.9. Adaptation of rhotics

<table>
<thead>
<tr>
<th>Hollenbach 1973</th>
<th>XEQIN Radio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vr.C</td>
<td>#rV</td>
</tr>
<tr>
<td>r-r</td>
<td>24</td>
</tr>
<tr>
<td>r-rr</td>
<td></td>
</tr>
<tr>
<td>r-ʂ</td>
<td></td>
</tr>
<tr>
<td>r-Ø</td>
<td>3</td>
</tr>
<tr>
<td>rr-rr</td>
<td></td>
</tr>
<tr>
<td>rr-r</td>
<td>0</td>
</tr>
<tr>
<td>rr-ʂ</td>
<td></td>
</tr>
</tbody>
</table>

The rest of this analysis includes data from both data sources but will focus primarily on the adaptation of rhotics in XEQIN data.

Between a Vowel and a Consonant: VrC

In the 1973 data, rhotics found in this context seem to be problematic and were most often repaired through deletion as seen in 79 and epenthesis as seen in 80.

(79) Deletion in VR.C (Hollenbach 1973)

a. bicarbonate (Sp 'bicarbonate') [nato\(^4\)]
b. measurement (Sp 'cuartilla') [diла\(^4\)]

(80) VrC in monolingual vowel epenthesis (Hollenbach 1973)

a. oven (Sp 'horno') [gorino\(^4\)]
b. strength (Sp 'fuerza') [werisa\(^4\)]

The bilingual data no longer shows epenthesis in this context. Instead, we can see the two tada sources. Please see Chapter 3 for more details.
effects of the internally motivated unstressed vowel deletion on the ‘r’ as it comes into contact with the obstruents and sonorants and is realized as a trill example 81 and retroflex sibilant, example 82.

(81) VrC in bilingual data is maintained and triggers ‘r’-/ɾ/ (XEQIN)

a. article (Sp 'artículo') [arti³glo¹]
b. aguardiente (Sp 'aguardiente') [rnde⁴]
c. harp (Sp 'harp') [arpa⁴]
d. Charles (Sp 'Carlos') [karlos⁴]

(82) VrC in bilingual data is maintained and triggers ‘r’-/ʂ/ (XEQIN)

a. aguardiente (Sp 'aguardiente') [ʂnde⁴]
b. North: U.S. (Sp 'norte') [noʂte⁴]
c. Robert (Sp 'Roberto') [robeʂto⁴]
d. administration (Sp 'mayordomía') [mayoʂtomia⁴]

Word Initially: #rV

The primary method of adaptation in both data sources for rhotics in this context is simplification. In XEQIN Radio, data maintenance of flap occurred in 23 out of 32 possible instances. Other adaptations include the production of a Spanish trill and production of Triqui retroflex. At first glance, it may seem that the maintenance of the trill is due to influence of Spanish allophonic distribution but, in reality, it is most often linked to vowel deletion which triggers a retroflex sibilant pronunciation as seen in 83⁶³

⁶³ “[N]onultimas are articulated so rapidly that the vowel is often reduced and/or
(83) Word initial production of trill/retroflex due to unstressed vowel deletion

a. remedy (Sp ‘remedio’) [remedy⁴]~[ʂumedyo⁴]
b. result (Sp ‘resultado’) [ʂsultado⁴]~[ʂesultado⁴]

From this data we can see a possible shift in place. Faithful production of the ‘r’ in this position would require some sort of trill. Most of the data shows a Spanish flap pronunciation word initially and, as seen above, many cases of a more Spanish-like pronunciation are actually triggered by contact with a consonant caused by vowel deletion or reduction. In all, 6 out of 32 words with word initial ‘r’ were produced with a Spanish trill. This is not out of line, however, with what we would expect given the normal allophonic distribution of this sound in Triqui, and may indicate that the Spanish alveolar trill is entering into the allophonic distribution defined above to create a [ɾ]~[ɾ̥]~[ʂ].

Intervocally: VrV & VrrV

As suspected, Triqui is extremely faithful to input in this position. The flap shows no variation in either data source. The intervocalic trill was universally simplified in Hollenbach’s data and showed some variation between [ɾ]~[ɾ]~[ʂ] in Radio XEQIN data.

Of the ten examples with an intervocalic trill, six were faithful to input, three were produced as a flap as in 84, and one was produced as a retroflex sibilant.

(84) Example of simplification trill to flap in XEQIN

a. road (Sp ‘carretilla’) [karetiya⁴]

(85) Intervocalic the trill to retroflex sibilant in XEQIN

devoiced” (B Hollenbach 1977: 42)

64 Dialect and speaker characteristics probably have a lot to do with this. This would be a fruitful area for a study.
a. baseball cap (Sp ’gorro’) [gošo^4]

The variation found in the intervocalic trill is also not surprising and is in line with what we saw word-initially. This variation between /r/ and /rr/ intervocally occurs in many words and often by the same speaker in elicitation data.

(86) Variation in /rr/ in established loans (from elicitations)

a. rice (Sp ’arroz’) [aru^4]~/[(g)aru^4]
b. donkey (Sp ’burro’) [uro^4]~/[uro^4]
c. guitar (Sp ’guitarra’) [guita^4]~/[guitaɾ^4]

In sum, the flap in intervocalic position is always maintained as a flap in both data sources. The trill shows some variation. In Hollenbach’s data it is always simplified. In the XEQIN data it is often produced as a flap. However, maintenance of the trill is also common as well as production of retroflex sibilant. At this point, linguistic consciousness and access to native phonotactic rules has little effect on faithfulness to the ‘rr’ as a trill word-initially. Intervocally, the variation shows that faithfulness to the trill may happen on a word-by-word basis, with older loans being more prone to simplification. Maintaining the trill intervocally is not problematic, but it is also not important phonemically.

‘r’ and ‘rr’ After a Consonant: CrV

Hollenbach’s data shows a good amount of maintenance as seen in 87. Maintenance is unsurprising since obstruent + rhotic consonant clusters are reported to have entered into use in Triqui relatively early on (Hollenbach 1977a: 39). Deletion is most often due to loss of syllable over time as in 88.
(87) Obstruent + rhotic consonant clusters (Hollenbach 1973)

a. liter (Sp 'litro') [litro]<sup>4</sup>
b. April (Sp 'abril') [abri:<sup>4</sup>]
c. father (Sp 'padre') [padre]<sup>4</sup>
d. wire (Sp 'slambre') [lambre]<sup>4</sup>
e. coriander (Sp 'culantro') [landro]<sup>4</sup>

(88) Deletion in Hollenbach 1973

a. Sacristan (Sp 'sacrístán') [ʒita]<sup>4</sup>
b. mother of woman’s godchild voc (Sp 'comadre') [mane]<sup>5</sup>
c. ‘father of godchild voc’ (Sp 'copadre') [bah]<sup>5</sup>~[wah]<sup>5</sup>
d. president (Sp 'presidente') [snde]<sup>4</sup>~[zinde]<sup>4</sup>

In XEQIN Radio, the vast majority of adaptations involve maintenance of the flap. In fact, of the 78 words with an ‘r’ in this position, 73 maintain the flap. The one case of trill production, /ri.'ke / from Enrique, is most likely due to the presence of a word initial syllable with nasal coda, which, even after deletion, may be encouraging the trill. The two cases of simplification are also different iterations of the same word. In one case, the resyllabification of the ‘n’ encouraged the insertion of a ‘d’ to create /e.ndri.ke<sup>4</sup>/ and in the other, the deletion of the ‘n’ in coda position left behind only the nasal vowel putting this sound into an intervocalic position and thus encouraging the flap.<sup>65</sup>

____________________

65 Nasal codas are discussed further in the next section.
(89) Three iterations of the word Enrique ‘Henry’ (XEQIN)

a. [rike⁴]

b. [endrike⁴]

c. [ūrike⁴]

Finally, obstruent + r consonant clusters do not pose much of a problem for Triqui speakers when it comes to velar and bilabial obstruents but there is some evidence in the data that velar obstruents trigger epenthesis in both newer and older loans. In example 90a, this epenthesis is accompanied by metathesis. Example 90b shows this epenthesis in modern loans. Since this data came from radio broadcasts, there are many examples of grabar ‘to record’, grabación ‘recording’, and grabadora ‘recorder’ all showing that epenthesis in this position is a relatively common occurrence. It is unclear at this point why the velar optionally triggers epenthesis while the alveolars and bilabials do not.

(90) Epenthesis of g + r

a. tigre ‘tiger’ [tirige⁴] (Hollenbach 1973)

b. grabadora ‘recorder’ [garabadoh⁴] (XEQIN)

In sum, the relatively consistent production of the flap after a consonant and before a vowel (CrV) is unsurprising as it is not completely foreign to the language. The name Triqui, although most likely given to them, has been used by Triquis for centuries. There is also evidence that the word ‘reh³’ or father (vocative form) comes from padre (Longacre 2004) and is even written as ‘dreh³’ in the Chicahuaxtla dictionary (Good
Triqui and Spanish rhotics have a few points of convergence in regards to pronunciation or rhotics. Where they are the same (intervocally) there is very little variation. Where they are most different, word-initially and before a consonant, there is a great deal of variation. Although it is increasingly being used in native contexts, the Spanish trill cannot be considered a borrowed phoneme in Triqui at this point. It is primarily used in contexts where the retroflex sibilant is used which can be seen in native words like ‘ball’, which went from /rumii³/ to /潩mii³/ and in loanwords like remedio ‘medicine’, which becomes /ㄳmedyo⁴/. If it were patterning after Spanish it should remain a trill intervocalically. This is not the case, however, and it alternates with the flap as can be seen in many older loans such as in arroz ‘rice’, which was pronounced /aruu⁴/ and /garuu⁴/ and burro ‘donkey’, which was adapted as /uɾo⁴/ and /uro⁴/ and even /buro⁴/. Instead, this sound should be considered an additional allophone of the fortis retroflex rhotic [r]~[ɾ]~[ʂ]. The next section will look in more detail at how it came about and make some predictions for how this sound might be incorporated in the future.

4.3.3. Incorporation of Spanish Rhotic through Internal Shift
As demonstrated above, the incorporation of the Spanish trill into Triqui is more than a simple contact phenomenon; it is the product of internal shifts unmotivated by contact with Spanish. The first shift involves the increase use of affricates and rhotics nonfinal syllables, which seems to have originated in fused phrases by reduction from /tʂ/ to /ɾu/ from ‘fruit’ or ‘round object’ /tʂu³/ and ‘tree’ or ‘wood’ /tʂu:³/ used as prefixes (Longacre 1975: 68-70) found in Hollenbach (1977a).
(91) ‘r’ in non-final syllables

a. tomato       [ratžĩ³]
b. pine tree     [ratʃĩ³]  (ruguchriin – Chicahuaxtla dialect- [Good 1979])
c. oak tree      [ritšuŋ³]

As a sibilant, this sound is subject to reduction/lax pronunciation in this position. Since the flap is the lax variant of this sound, there is little change in this context.

The second shift, however, picks up where the first leaves off as increasing nonfinal vowel deletion causes consonants to come into contact that were not in contact before. In the case of the alveolar sibilant it has created few changes other than to reinforce the fortis/voiceless pronunciation of ‘s’, which was already quite common in the language.

When the ‘r’ and the retroflex sounds were brought into new contexts through this deletion, some less prominent phonemes were brought to the surface. Table 4.10 is an overview of the effects of this process.

Table 4.10. Effects of nonfinal vowel deletion in Copala Triqui

<table>
<thead>
<tr>
<th></th>
<th>t/d</th>
<th>k/g</th>
<th>n/m</th>
<th>/tʃ/</th>
</tr>
</thead>
<tbody>
<tr>
<td>s</td>
<td></td>
<td>/ska³/</td>
<td>/smanã³/</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>‘tough’</td>
<td>‘week’</td>
<td></td>
</tr>
<tr>
<td>f</td>
<td>/ʃtãã³/</td>
<td>/ʃtah³/</td>
<td>/ʃtah³/</td>
<td></td>
</tr>
<tr>
<td></td>
<td>/ʃtãã³/</td>
<td>/ʃnee³/</td>
<td>‘ditch’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>/ʃtãã³/</td>
<td>/ʃtãã³/</td>
<td>‘pants’</td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>/ʃikua³/</td>
<td>/ʃka³/</td>
<td>/ʃka³/</td>
<td></td>
</tr>
<tr>
<td></td>
<td>/ʃkua³/</td>
<td>‘ant’</td>
<td>‘pigs’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>/ʃkua³/</td>
<td>/ʃkua³/</td>
<td>‘beep’</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>/ʃitʃɔj³/</td>
<td>/ʃhe³/</td>
<td></td>
</tr>
<tr>
<td>/tʃ/</td>
<td>/ʃtuka³/</td>
<td>/ʃkakaa³/</td>
<td>/ʃkakaa³/</td>
<td></td>
</tr>
<tr>
<td></td>
<td>/ʃkakaa³/</td>
<td>‘pig’</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

132
Finally, the existence of a retroflex voiceless trill allophone may be opening the door for the Spanish trill to be used. This can be found in words where the consonant cluster remains and in words where only the rhotic sibilant remains. Increasing preference for Spanish retroflex trill would bring the rhotics in line with the other sibilants from an articulatory standpoint. The switch from \( r \sim \tilde{z} \) to \( r \sim r \) also makes sense from an articulatory standpoint creating oppositions in sibilants at three points of articulation: alveolar \( s/z, \) alveolar \( l/r, \) and palatal \( j/\tilde{z}. \) A shift like this, however, may eventually diminish the role of the retroflex affricate to isolated words.

### 4.4 From suprasegmental to segmental: Spanish /x/ to Triqui /h/

The velar fricative in Spanish is realized in different ways in different dialects of Spanish from the palatal fricative in Chile, to the velar fricative of Spain. In the Oaxaca region of Mexico, this sound is produced as an aspirated laryngeal fricative similar to the laryngeal fricative of Triqui. Unlike the labiodental fricative, this sound does have a segmental counterpart in Triqui; it is limited to word-final coda position and functions on the suprasegmental tier along with tone rather than the segmental tier (Hollenbach 1984). Earlier descriptions of the language lead to faithful adaptation of /h/ (Hollenbach & Hollenbach 1975) and Hollenbach herself claims Spanish loanwords have caused the change in distribution of /h/ by allowing it to occur alone and in cluster with /w/ in the onset of final syllables. She also mentions the increased usage of this sound in nonfinal syllables by some speakers (Hollenbach 1977).
(92) Examples of common loans with aspirated laryngeal

a. elephant  (Sp 'elefante')  [lehwande⁴] (Hollenbach 1977)
b. gate  (Sp 'reja')  [re.ha⁴] (Hollenbach & Hollenbach 1975)
c. roof tile  (Sp 'teja')  [te.ha⁴] (Hollenbach 1984)

The corpus of this study also supports this claim showing that this sound is not only imported, but treated very similarly by both bilinguals and monolinguals. Maintenance is the most common strategy, deletion is rare, and words with a labiovelar glide often vary between hw, gw, and kw.

Table 4.11. Adaptation of laryngeal fricative

<table>
<thead>
<tr>
<th>Hollenbach (1973)</th>
<th>XEQIN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sp-Tr</td>
</tr>
<tr>
<td>h-h</td>
<td></td>
</tr>
<tr>
<td>h-Ø</td>
<td></td>
</tr>
<tr>
<td>h-ʃ/ʒ</td>
<td></td>
</tr>
<tr>
<td>h- hw gw kw</td>
<td></td>
</tr>
<tr>
<td>Sp-Tr</td>
<td>Final syllable</td>
</tr>
<tr>
<td>h-h</td>
<td>14</td>
</tr>
<tr>
<td>h-Ø</td>
<td>0</td>
</tr>
<tr>
<td>h-ʃ</td>
<td>0</td>
</tr>
<tr>
<td>h- hw gw kw</td>
<td>4</td>
</tr>
</tbody>
</table>

In addition, a closer look at the examples of deletion show that it is due to deletion of the first syllable rather than any targeting of the segment as seen in example 93.

(93) Deletion of aspirated laryngeal in data set (Hollenbach 1973)

a. gelatin  (Sp 'gelatina')  [ladina⁴]
b. Jesus  (Sp 'Jesús')  [zu⁴seh²]

The only counterexamples are of adaptation to a sibilant. While this may seem problematic, it is actually more indicative of when the lexical item was borrowed rather than how. The shift from sibilant to velar pronunciation of /ʃ/ in Spanish happened during
the early period of Spanish colonization. These words represent produce that was not
grown in the Triqui region and other items that would most likely have been introduced by
Spanish colonizers either directly or through Mixtec as Triquis traded with speakers of
Mixtec and Spanish in the local markets.\textsuperscript{66}

(94) Older loans adapted with colonial pronunciation of the laryngeal

(Hollenbach 1973)

\begin{itemize}
\item a. needle (Sp 'aguja') \thinspace /guʃa^4/
\item b. jicama (Sp 'jícama\textsuperscript{67}) \thinspace /ʒi^3\text{game}^2/
\item c. garlic (Sp 'ajo') \thinspace /keʃo^4/
\end{itemize}

Finally, there is a tendency in Triqui for the semivowel /w/ to be used in conjunction
with laryngeals and velars. Most likely the prominence of labiovelar segments in Triqui
and the fact that each case occurs in a syllable that receives primary stress have
something to do with this tendency.

(95) The velar is used when there is a labiovelar semivowel

\begin{itemize}
\item a. judge (Sp 'juez')
  \begin{enumerate}
  \item [hwes:] (XEQIN)
  \item [gwe\textsuperscript{3}se\textsuperscript{1}] (Hollenbach 1973)
  \item [kwe\textsuperscript{3}se\textsuperscript{1}] (XEQIN)
  \end{enumerate}
\item b. John (Sp 'Juan')
  \begin{enumerate}
  \item [waa^4] (Hollenbach 1973)
  \end{enumerate}
\end{itemize}

\textsuperscript{66} In the San Juan Colorado dialect of Mixtec garlic is yajű.

\textsuperscript{67} This word is jícama in most dialects. I am not sure why Hollenbach writes it as jícama.
In sum, the laryngeal fricative /h/ is relatively similar in both Oaxacan Mexican Spanish and Triqui. While traditionally this sound is only used suprasegmentally in word-final codas, it was quickly adapted to be used in onset position in loanwords by bilinguals and monolinguals alike. Nonfaithful adaptations are most likely attributed to the presence of sibilants in input form of colonial Spanish in the case of \( h \rightarrow f \) and the presence of a labiovelar glide in the case of \( h \rightarrow hw/gw/kw \).

There are two facts about the use of the aspirated laryngeal in Triqui that may provide additional insight into its early importation. First, the dual roles of glottal as both segmental, as well as a suprasegmental conditions using the /h/ on both tiers as well. Second, Hollenbach posits that Triqui may be in a transition period between the tier structures (Hollenbach 1984). If this is true, the use of /h/ may not be considered borrowing at all since it would already be considered a segmental feature of the language (See section 2.3 for more on laryngeal codas). Finally, the possible transition to a segmental tier may have also been partially spurred on by resyllabification that occurs when laryngeal codas are followed by the declarative marker \( a^{32} \). In essence, any word ending in /h/ or /ʔ/ that is also followed by the vowel, most often a declarative marker ‘a\(^{32}\)’, will end up with a stronger onsetlike pronunciation of the laryngeal. For example, the sentence \( yā5\ me^3\ canu^3\ a^{32} \) or ‘that is a shoe’ would be pronounced \([ŋā5\ me^3\ kanu^3\ ha^{32}]\). Perceptually, the frequency of the declarative structure would certainly give this
sound a much more prominent role than as a simple coda with a weakened pronunciation.

4.5 Sounds that resist importation /f/ and /ɲ/
To this point, the behavior of four Spanish phonemes not present in Triqui has been described, /b/, /p/, /x/, and /ɾ/. Of these three sounds, the /p/ was borrowed very early on and the /b/ has resisted direct importation but may show signs of increased use in bilinguals. The /ɾ/ and /h/ are productively used in Triqui by monolinguals and bilinguals alike as they have entered Triqui through internally motivated shifts. Furthermore, the bilabials and rhotics have the potential to affect the native obstruent and sibilants outside the context of loanwords. This section reviews two Spanish sounds that have resisted importation, /f/ and /ɲ/.

4.5.1. The Voiceless Fricatives /f/
The /f/ does not exist in native Triqui words as a phoneme or an allophone of an existing phoneme. In fact, no labiovelar phoneme exists in Copala Triqui. It is predicted, then, that this sound will do one of three things: 1) remain as faithful to place as possible adapting as a bilabial sound; 2) remain faithful to manner and adapt to another fricative, which in this case would have to be the /h/, a segment that is not a native segmental phoneme either; or 3) import directly without any adaptation. Table 4.12 outlines the adaptation strategies for this sound in monolingual and bilingual data sources. This sound negotiated between options 1 and 2 in the monolingual data and between 1 and 3 in the bilingual data.
Table 4.12. Adaptation of labio-dental fricative

<table>
<thead>
<tr>
<th>Sp-Tr</th>
<th>Final syllable</th>
<th>Nonfinal syllable</th>
<th>Sp-Tr</th>
<th>Final syllable</th>
<th>Nonfinal syllable</th>
</tr>
</thead>
<tbody>
<tr>
<td>f-f</td>
<td>0</td>
<td>0</td>
<td>f-f</td>
<td>3</td>
<td>33</td>
</tr>
<tr>
<td>f-b</td>
<td>0</td>
<td>1</td>
<td>f-b</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>f-w/β</td>
<td>1</td>
<td>5</td>
<td>f-w/β</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>f-p</td>
<td>2</td>
<td>0</td>
<td>f-p</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>f-g</td>
<td>0</td>
<td>1</td>
<td>f-g</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>f-h</td>
<td>2</td>
<td>3</td>
<td>f-h</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>f-Ø</td>
<td>0</td>
<td>2</td>
<td>f-Ø</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

What is immediately apparent is that Hollenbach’s data shows that this sound is always adapted into a native sound. Even in final syllables in Hollenbach’s data, it adapted to the voiceless bilabial obstruent twice and the aspirated laryngeal twice as we can see in example 96. This sound is mapped onto a range of bilabial sounds; when that sound is the bilabial glide, it often maintains faithfulness to place and manner of articulation.

(96) Adaptation of /f/ in final syllables (Hollenbach 1973)

a. fertilizer (Sp 'alfalfa') [alapa⁴] ~ [alpa⁴] ~ [lahwa⁴]
b. coffee (Sp 'café') [ka.hwe⁴] ~ [gahwee⁴] ~ [gawee⁴]

68 This section divides the bilabials into obstruent /b/ and nonobstruent /w/, /β/ pronunciations. Recall that the nonsonorant bilabial in Triqui /W/ can be realized as any of the three. In Hollenbach’s data all adaptations to a bilabial are transcribed as either /w/ or /b/. The inclusion of /w/ versus /β/ is to check whether the /f/ would tend to adapt to another fricative bilabial.
When maintenance was not employed, the most common strategy in both sources was adaptation as the bilabial glide as seen in example 97. In bilingual data this was often produced as the fricative /β/ as well as the glide /w/.

(97) Faithfulness to place

a. coffee (Sp 'café') [gawee⁴] (Hollenbach 1973)
b. strength (Sp 'fuerza') [werisa⁴] (Hollenbach 1973)
c. elephant (Sp 'elefante') [lawande⁴] (Hollenbach 1973)
d. February (Sp 'febrero') [werero⁴] (Hollenbach 1973)
e. telephone (Sp 'teléfono') [tele³wono¹] (XEQIN)
f. factory (Sp 'fábrica') [βa³brika¹] (XEQIN)

Adaptation to the aspirated laryngeal was also found in both data sources. The one case of f>h in the bilingual data was the word fumigar pronounced as [humiga⁴]. In Hollenbach’s data the /f/ is adapted as [h] when a labiovelar glide could be inserted. This happens in both final and nonfinal syllables as seen in example 98.

(98) Maintenance of both labiality and fricative f-hw (Hollenbach 1973)

a. coffee (Sp 'café') [kahwe⁴] ~ [gahwee⁴]
b. fertilizer (Sp 'alfalfa') [lahwa⁴]
c. elephant (Sp 'elefante') [lehwande⁴] ~ [elehwande⁴]
Deletion is also found in both data sources as can be seen below.

(99) Deletion in both data sources

a. fiscal (Sp 'fiscal') [rikaa⁴] (Hollenbach 1973)
b. skinny (Sp 'flaco') [lako⁴] (Hollenbach 1973)
c. strength (Sp 'fuerza') [orsa⁴] (XEQIN)

There were a few instances of adaptation as an obstruent. This occurred in a consonant cluster as in 100a, in a final consonant as in 100b,c, and word initially as in 100c.

Prohibitions against two labials in the same syllable in a word like lightbulb, Sp 'foco', may then force the bilabial to velarize producing ‘goko⁴’, instead of ‘boko⁴’, or ‘poko⁴’.

(100) Adaptation of ‘f’ to an obstruent (Hollenbach 1973)

a. Arrow bus company (Sp 'flecha') [bleʃa⁴]
b. fertilizer (Sp 'alfalfa') [alapa⁴] ~ [alpa⁴]
c. lightbulb (Sp 'foco') [goko⁴]

Although the production of the bilabial glide in both sources of data seem to indicate a similar process of adaptation, the two productions of the glide in Hollenbach’s data and XEQIN actually come from different processes. In Hollenbach’s data it comes from adaptation to a bilabial segment. In XEQIN the sound is imported directly and is then optionally voiced in non-final syllables as can be seen in example 101, which shows

69 It is unclear whether this is a nonfaithful adaptation of /ʃ/ to /ɾ/ or of the sibilant /ʃ/ to /ɾ/ as in (fiscal → wi.zi.ka⁴ → ri.kaa⁴).
variation of the same word as pronounced by the same speaker over the course of various radio broadcasts.

(101) Newer patterns of adaptation (XEQIN)

a. factory (Sp ‘fábrica’) [fa³ˈbrika] ~ [βa³ˈbrika]

b. telephone (Sp ‘teléfono’) [tele³ˈfono] ~ [tele³βono] ~ [tele³woNO]

c. strawberry (Sp ‘fresa’) [fre.sa³] ~ [βresa]

In sum, the labiodental fricative seems to have gone through a period of instability in place and manner of articulation as monolingual adaptation to a bilabial glide or possibly bilabial fricative is giving way to direct importation of this phoneme. Currently the labiodental fricative is only productive as monolinguals most likely adapt /f/ directly as /W/ in the input form, and may then velarize in the surface form depending on linguistic context. Bilinguals import the /f/ directly and can then produce it as [f], [β], or [w] in the surface form. For the purpose of this study the labiovelar fricative will not be considered imported since there is no empirical evidence that monolinguals incorporated it into their speech.\(^\text{70}\) In bilingual speech this sound currently follows expected patterns of voicing in Triqui, surfacing as a bilabial fricative in nonfinal syllables and remaining faithful to input in final syllables. Another fact to support the idea that ‘f’ is recently becoming imported is that later descriptions show ‘f’ as directly imported in specific high frequency words such as:

\(^\text{70}\) In an elicitation session with a monolingual female, three words containing /f/ were elicited, and in each the f was adapted as the bilabial /w/. Coffee (Sp ‘café’) was produced as /kahwee⁴/; telephone (Sp ‘teléfono’) was produced as /telewono⁴/; and elephant (Sp ‘elefante’) was produced as /lewande⁴/.
as coffee (Sp 'café') which is now written as /ka³fe⁴/ (Hollenbach 2005a,b).

The ‘f’ will continue to be used with high frequency in loanwords but will have little impact on the language as a whole. In a sense, this shift can be considered contact-induced but it should prove to have very little impact outside of the realm of loanword adaptation.

4.5.2 The Palatal Nasal/ɲ/
In Spanish, the palatal nasal exists as a separate phoneme. Triqui, in turn, does not have a palatal nasal as a separate phoneme but rather as an allophone of the palatal glide that comes about as a consequence of leftward nasal spreading. This means that a word like yãh⁵ or ‘paper’ is most often pronounced as /ỹãh⁵/ and when given emphasis as /ɲãh⁵/.

Since the palatal nasal already exists in Copala Triqui as an allophone of the palatal glide, Triqui speakers should have little trouble pronouncing the palatal nasal. Alternatively, since there is evidence that Triqui has little trouble spreading nasality leftward (often deleting the consonant as we have seen in nasal codas), it is also likely that this sound may get split into two parts, one nasal and the other palatal.

Hollenbach’s data shows that, at least in older adaptations, that each instance of ‘ñ’ is adapted as a nasal palatal glide rather than a Spanish palatal nasal consonant. In 102 below I have included Hollenbach’s actual transcription with the appropriate phonetic realization with nasal spreading next to it.

(102) Instances of adaptation of Spanish ‘ñ’ (Hollenbach 1973)

a. stud animal (Sp ‘garañon’) garayuun⁴ [garâyũũ⁴]
b. canyon (Sp ‘cañon’) cayon⁴ [kãỹõ⁴]
c. chestnut barrel (Sp ‘castaña’) gaʒitayon⁴ [gaʒitãỹõ⁴]
d. cradle (Sp ‘cuña’) guyan⁴ [gũyã⁴]
e. habit/vice (Sp 'maña') mayon⁴ [mãyo⁴] ~ mayan⁴ [mâyã⁴]
f. napkin/cloth (Sp 'paño') wayon⁴ [wâyõ⁴] ~ bayon⁴ [bâyõ⁴]
g. rich lady (Sp 'señora') zyora⁴ [zyora⁴] ~ zora⁴ [zora⁴]

The radio data hints at a possible a continuum between maintenance of the palatal nasal in nonce borrowings (more careful pronunciation) to creation of n + ñ sequence, to the more traditional ñ + ñ adaptation as in 103. There were also two examples outside of this continuum, both of the word 'Ituñoso', the name of one of the major towns in the Triqui region and the name of a specific dialect of Triqui. In both cases, the palatal nasal is deleted but in one case nasality is maintained through metathesis.

(103 ) Adaptation of palatal nasal in Spanish loans in Triqui

a. place name (Sp 'Castañadas') [kastĩĩadas⁴]
b. birthday wishes (Sp 'mañanitas') [mãĩĩanitas⁴]
c. bricklayer (Sp 'albañil') [albãỹi⁴]
d. campaign (Sp 'campaña') [kampaña⁴]
e. place name (Ituñoso) [intuyoso⁴]–[tuyoso⁴]

While six examples are not enough to be able to draw definitive conclusions, it is likely that direct importation of the palatal nasal ‘ñ’, although it exists in Triqui as an allophone, is not a productive adaptation strategy in Triqui in either data source. The suprasegmental role of nasality ensures that the palatal nasal is easily split into its components [+ nasal] [+ palatal] even when there is a palatal nasal allophone already present in the language.⁷¹

⁷¹ This preliminary finding was somewhat surprising to me as the palatal nasal is a relatively common allophone. Even more, in elicitation sessions some speakers’ orthographic preference is ‘ñ’.
4.6. Adaptation of Sibilants and Sonorants in Coda Position

The previous sections have highlighted the use of Spanish segments in Triqui and their possible role in contact-induced language shift. This section highlights the role of loanword adaptation in uncovering latent rules in Triqui. Spanish and Triqui allow different elements in word-final coda position. In Spanish, sonorants /l/, /n/, and /ɾ/ as well as the sibilant /s/ are allowed; in Triqui, only laryngeals are allowed. This section highlights the unique role of sibilants and nasals in word-final coda position Triqui.

4.6.1 Sonorants: /l/ /m/ /n/

4.6.1.1 Lateral /l/

The /l/ in Spanish and Triqui are produced in the same manner. While in other dialects of Triqui the lateral can have a fortis (long) and lenis (short) pronunciation (Good 1979; DiCanio 2008), in Copala Triqui this difference has not been found (Hollenbach 1984). The primary source of variation in the adaptation of this sound is between onset and word-final coda position. Table 4.13 shows the adaptation patterns of laterals in onset, word-medial coda, and word-final coda position in Hollenbach’s data. From this table it is clear that the lateral is always maintained in onset position, and in coda position it is more vulnerable to deletion and change.
Table 4.13. Adaptation of Spanish ‘l’ in both data sources

<table>
<thead>
<tr>
<th>Hollenbach (1973)</th>
<th>XEQIN Radio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Onset</td>
</tr>
<tr>
<td>l-l</td>
<td>71</td>
</tr>
<tr>
<td>l-Ø</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
</tr>
</tbody>
</table>

For the most part, one-to-one mapping of Spanish lateral to the Triqui lateral is the most common adaptation word initially and in word medial coda position. Only one example of deletion could be found and is the result of syllable deletion rather than the targeting of any specific segment as seen in 104.

(104) Deletion of ‘l’ in onset position

a. pencil (Sp 'lapicero') [sero⁴]

There are also few examples of nonfaithful adaptations and these are only found in Hollenbach’s data. In some cases the ‘l’ was adapted to the ‘r’ or ‘n’ as can be seen in 105(a-c). There were also two examples of epenthesis as seen in 105(c,d). No examples were found in XEQIN Radio.⁷²

(105) Nonfaithful adaptations (Hollenbach 1973)

a. soldier (Sp 'soldado') [snado⁴]

b. broth/soup (Sp 'caldo') [gando⁴–[kando⁴]

c. ticket/fine (Sp 'multa') [murita⁴]

d. type of alcohol (Sp 'mezcal') [meziga³le¹]

⁷² Given the fact that ‘r’ is a sibilant in Triqui and not a sonorant adaptation of ‘l’ to this sound is unexpected.
The data sources diverge when the ‘l’ is in coda position. Word medially this sound often resyllabifies when it occurs before a stop or nasal. This is true in both data sources as in

(106) Maintenance in word medial coda position XEQIN

a. strike (Sp 'huelga') [welga^4]
b. fine/ticket (Sp 'multa ') [wulta^4-multa^4]
c. place name (San Telmo) [santelmo^4]
d. solider (Sp 'soldado') [danuu^3 soldado^4]
e. President Calderón [kalderõh^4]
f. culture (Sp 'cultura') [kulturah^4]–[kultura^4]
g. result (Sp 'resultado') [rzultado^4]–[gesultado^4]

Deletion in word medial coda position most often occurs at the syllable level as in 107a,b. There is only one example of deletion happened at the segmental level (107c), which makes it difficult to say whether the lateral bilabial onset was the cause or if the fact that Culberto is a proper name may be at play.

(107) Deletion in word medial coda

a. Alfonso [fonso^4]
b. cotton (Sp 'algodón') [oto.^4]
c. Culberto [kuʔberto^4]

In word-final coda position deletion was the most common strategy in both data sources.
(108) Deletion in word-final coda (Hollenbach 1973)

a. April (Sp 'abril') [abriː]
b. one thousand (Sp 'mil') [miː]~[mih]

(109) Deletion in word-final coda XEQIN

a. April (Sp 'abril') [abriː]
b. capital city (Sp 'capital') [kawita]~[kapita]
c. hospital (Sp 'hospital') [ospita]
d. infantile (Sp 'infantil') [fanti]
e. one thousand (Sp 'mil') [miː]~[mih]
f. peacock (Sp 'pavo real') [paworiah]

There were two case of epenthesis in Hollenbach’s data, both occur in words with word-final primary stress and both involve words that could have entered easily through Mixtec. No examples of epenthesis were found in XEQIN data.

(110) Word-final epenthesis (Hollenbach 1973)

a. mezcal liquor (Sp 'mezcal') [mezigaːle]
b. knapsack (Sp 'morral') [moraːle]

Examples of maintenance are found in nonce borrowings as seen in 111 although nonce-borrowing also show a great deal of variation between maintenance and deletion even within the same word as seen in 112

(111) Maintenance in word-final coda (XEQIN)

a. festival (Sp 'festival') [festiβal]
b. Huichol Indians (Sp 'Huichol') [wichol]
c. monthly (Sp 'mensual') [menswal̃]
d. shell (Sp 'caracol') [karakol̃]

(112) Variation in word-final coda

a. original adj (Sp 'original') [orihinal̃]~[orihinã]
b. license/credential (Sp 'credencial') [gredensyã]~[kredensyã]~[kredensial̃]

In sum, the lateral sonorant follows a relatively predictable pattern. The lateral is consistently maintained in onset position with only one example of deletion in Hollenbach’s data, lapicero   serõ. In work-internal coda position there is a strong preference for maintenance through resyllabification to the onset in the following syllable. Word-final ‘l’ is most often deleted. In Hollenbach’s data there are also cases of word-final epenthesis although this is found in older loans, which are more likely to have entered through Mixtec (mezcal   mezigale). In the speech of balanced bilinguals, the lateral is increasingly maintained due to increased access to Spanish phonotactic rules and increasing use of nonce-borrowings.

4.6.1.2 Bilabial Nasal /m/

The bilabial nasal is pronounced almost identically in both languages and since it is a sonorant in Triqui there is no difference in pronunciation in final or nonfinal syllables. As with the /l/, Triqui adapts the Spanish bilabial as its Triqui bilabial nasal counterpart with almost no alteration. Only one nonfaithful adaptation was found word-initially in Hollenbach’s data. At this point, it is difficult to say why this nonfaithful adaptation took place or to draw even preliminary conclusions.
(113) Nonfaithful adaptation of ‘m' word initially (Hollenbach 1973)

a. commission  (Sp 'comisión')  [wisyũũ⁴]~[wisũũ⁴]

There was one example of a bilabial nasal in word-final coda position, see 114 below, which exhibited final /m/ deletion and leftward nasal spreading. It should be noted that this Spanish input comes from an English loanword in Spanish and that ‘m’ in word-final codas is not found in native Spanish words.

(114) /m/ word finally (XEQIN)

a. Dot-com  (Sp 'punto com')  [kõh⁴]

In sum, while there are only two lexical items that show nonfaithful adaptation of bilabial nasals. The example of onset adaptation from m > w is most likely due to the age of the loan and cannot be considered a productive strategy. The example word-final nasal coda deletion with leftward spreading of nasality, however, is a productive strategy that is present in adaptation of alveolar nasal codas in this language, as will be show in the next section.

4.6.1.3 Alveolar Nasal /n/
As is the case with the bilabial nasal, the alveolar nasal in Spanish and Triqui are pronounced in a relatively uniform manner. Table 4.14 gives an overview of nasal adaptation in onset, coda, and word-final position in monolingual and bilingual data. In onset and word-medial coda positions maintenance is the most common strategy, the latter
due to resyllabification.\textsuperscript{73} In word-final codas, the alveolar nasal is most often deleted or adapted to a nasal vowel although the XEQIN data shows a high degree of maintenance in nonce borrowings where the nasal can be resyllabified across word boundaries.\textsuperscript{74}

Table 4.14. Adaptation of alveolar nasal

\begin{tabular}{|c|c|c|c|}
\hline
 & Onset & Coda (WM) & Coda (WF) \\
\hline
\textit{n-n} & 45 & 52 & 0 \\
\textit{n-V} & 0 & 0 & 23 \\
\textit{n-Ø} & 2 & 6 & 9 \\
Other & 2 & 0 & 0 \\
\hline
\end{tabular}

\begin{tabular}{|c|c|c|c|}
\hline
 & Onset & Coda (WM) & Coda (WF) \\
\hline
\textit{n-n} & 75 & 111 & 21 \\
\textit{n-V} & 0 & 2 & 9 \\
\textit{n-Ø} & 0 & 13 & 21 \\
Other & 0 & 2 & 2 \\
\hline
\end{tabular}

The next sections give more detailed information on the treatment of the alveolar nasal in onset, word-internal coda position, and in word-final position.

\textbf{Onset}

As predicted, there was almost no variation in the production of the alveolar nasal in onset position. There were two examples of deletion in the dataset and two examples of ‘other’. The first can be attributed to deletion at the syllable level rather than the targeting of a specific segment as seen in 115 and the second is the adaptation of ‘n’ to the lateral ‘l’ as seen in 116 Since there were so few examples of this sort of adaptation and all were

\textsuperscript{73} There are only two examples of deletion in onset position in the whole dataset and they both come from canela ‘cinnamon’ panela $\rightarrow$ la.la\textsuperscript{4} for the drink made partially from cinnamon and ki.la.la\textsuperscript{4} to represent the plant (ki = plant in Triqui).

\textsuperscript{74} The data was not collected to look at word boundary. After seeing the higher degree of maintenance in word-final codas in XEQIN, a sample of items exhibiting this maintenance was taken.
limited to Hollenbach corpus, it should not be considered an active adaptation strategy.

(115) Deletion of onset n

a. Castilian (Sp 'Castellano') [ʒila⁴]

b. Nativity (Sp 'Natividad') [dita⁴]

(116) Other adaptations in onset position

a. cinnamon (Sp 'canela') [kilala⁴]

b. evaporated sugar cane (Sp 'panela') [lala⁴]

In sum, nasals in onset position do not show much variation in Hollenbach’s data and no variation in XEQIN data. The four examples of nonfaithful adaptation can be explained by the age of the word. In the case of n > 1, the fact that the onset of the final syllable is an ‘l’ may also have come into play.

**Word Medial Coda**

Table 4.15. Adaptation of alveolar nasal

<table>
<thead>
<tr>
<th>Hollenbach (1973)</th>
<th>XEQIN Radio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Onset</td>
</tr>
<tr>
<td>n-n</td>
<td>45</td>
</tr>
<tr>
<td>n-V</td>
<td>0</td>
</tr>
<tr>
<td>n-Ø</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
</tbody>
</table>

The alveolar nasal is a little more variable in mord-medial coda position although the most
productive strategy is maintenance through resyllabification in both bilingual and monolingual data. The presence of prenasalized consonants in Triqui as well as the correlation between nasal coda and obstruent voicing neutralization, \( p < .05 \) for velar obstruents and \( p < .01 \) for alveolar, makes this somewhat unsurprising. Aside from obstruents, word medial nasal codas have also come to resyllabify to create consonant clusters with affricates and sibilants through the incorporation of Spanish loanwords. Some examples of this include /lantʃa\(^4\)/ or ‘boat’ from the Spanish lancha, /ma.nsa.na\(^4\)/ or ‘apple’ from the Spanish manzana, and /ka.nso\(^4\)/ or ‘goose’ from the Spanish ganso (Hollenbach 1977a).

In both data sources, deletion of the word-medial nasal happened almost exclusively in the context of people and place names beginning with saint. This may be due to high usage or indirect importation through Mixtec. Each source also had one case that fell outside of this norm 117d and 117d. One possible explanation could be that the syllable in question had both a nasal onset as well as a nasal coda.

(117) Deletion of nasal coda WM position (Hollenbach 1973)

a. Saint Michael (Sp 'San Miguel') [zime⁴]~[zamige⁴]
b. menthol (Sp 'mentolado') [dolato⁴]~[delato⁴]
c. Saint Maria (Sp 'Santa María') [zimarya⁴]
d. tamed animal (Sp 'manso') [maso⁴]

(118) Deletion of WM coda (XEQIN)

a. Saint Matthew (Sp 'San Mateo') [samateo⁴]
b. city San Quintín (Sp 'San Quintín') [zaguidi:4~[zaguindi:4]
c. Saint Vincente (Sp 'San Vincente') [zwisente4~[zawsente4]
d. message (Sp 'mensaje') [mezahe4~[mesahe4]

Finally, the one specific context where resyllabification was problematic was the case of words of type #Vn.C that begin with a high vowel. In the XEQIN data this was repaired through a variety of strategies including resyllabification, syllable deletion, and leftward spread of nasality with deletion of either vowel or nasal consonant. There seem to be two explanations for this variation. First, a lexical nasal vowel in a nonfinal syllable is not allowed in Triqui. Only final syllables can have lexical nasality and nonfinal syllables can nasalize through leftward spreading. The second reason for the variation is that an n + f or n + rr consonant cluster (both of which involve a nasal plus a nonnative sound) appear to be illicit consonant clusters.

Table 4.16. Adaptation strategies for alveolar nasal in first syllable

<table>
<thead>
<tr>
<th>Spanish input</th>
<th>Resyllabification</th>
<th>Syllable deletion</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antonio (Anthony)</td>
<td>to.nyo4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enfermera (nurse)</td>
<td>e.nfe.me.ra4</td>
<td>Fe.me.rah4</td>
<td></td>
</tr>
<tr>
<td>Enrique (Henry)</td>
<td>e.ndri.ke4</td>
<td>ri.ke4</td>
<td>ü.ri.ke4</td>
</tr>
<tr>
<td>Ensenada (Ensenada -city)</td>
<td>e.nze.na.da4~e.nse.na.da4</td>
<td>se.na.da4</td>
<td></td>
</tr>
<tr>
<td>infantil (infant)</td>
<td>fa.nti4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>infección (infection)</td>
<td></td>
<td>i.fe.ksiō4</td>
<td></td>
</tr>
<tr>
<td>infracción (infracion)</td>
<td></td>
<td>mfra.ksiō4</td>
<td></td>
</tr>
<tr>
<td>Inglaterra (England)</td>
<td>i.ngla.te.ra4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>instrumento (instrument)</td>
<td></td>
<td>stru.me.ndo4</td>
<td></td>
</tr>
<tr>
<td>Internet (Internet)</td>
<td>i.n.te.rnet4~i.n.te.me4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>investigar (investigate -v.)</td>
<td></td>
<td>mbi.sti.g4</td>
<td></td>
</tr>
<tr>
<td>invitar (invite -v.)</td>
<td>i.mbi.ta4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In sum, resyllabification of word internal codas to create complex onsets is the most
common strategy. This is in line with native tendencies as prenasalized obstruents are native to Triqui and other nasalized segments seem to be unproblematic in loans (Hollenbach 1977a). There are a few language-specific areas that inhibit this process. First, syllables that begin and end with a nasal in Spanish do not resyllabify. The Spanish input *mensaje ‘message’ becomes [me.sa.he⁴] and not [*me.nsa.he⁴]. Second, there is a conflict when the first syllable of a word has a front vowel and nasal coda. Finally, there are some cases where an n + C onset is illicit or at least avoided, more specifically the non-native ‘f’ and ‘rr’ resist prenasalization.

**Word-Final Coda**
The alveolar nasal does one of three things in word-final coda position: maintain, delete, or delete with leftward spreading of nasality (see section 2.3.9 for more on leftward spreading of nasals). In Hollenbach’s data n > ū is the most common strategy, deletion without nasal spreading is also present. In the XEQIN data, deletion without leftward nasal spreading is more prevalent, as is maintenance of the nasal. While at first glance it may seem that maintenance is due to increased access to Spanish phonotactic rules, it is more likely that the nature of the data sources is coming into play.

Table 4.17. Adaptation of Spanish alveolar nasal

<table>
<thead>
<tr>
<th>Hollenbach (1973)</th>
<th>XEQIN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Onset</td>
</tr>
<tr>
<td>n-n</td>
<td>45</td>
</tr>
<tr>
<td>n-Ø</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
</tbody>
</table>

Please note that words that were elicited in isolation in Albany and California consistently demonstrate nasal unpacking or leftward nasal spreading. Since there is no feature for the
‘n’ to attach itself at the end of a word it deletes leaving behind only its nasality. This can be seen in Figure 4.4, which is a spectrogram of the loan for tren ‘train’, which can be pronounced as [trĩː⁴] or [trẽː⁴] depending on the speaker.

Figure 4.4. Spectrogram of tren ‘train’ pronounced as [trĩː⁴]⁷⁵

There is also some variation found in adaptation of word-final nasals. In Hollenbach’s data it often varies between nasal and oral vowels as in example 119 below.⁷⁶

---

⁷⁵ Both pronunciations /trĩː⁴/ and [trẽː⁴] are acceptable although [trĩː⁴] is the more conservative pronunciation. Nasalizing a mid vowel is more common in the speech of bilinguals.

⁷⁶ In XEQIN data, this nasalization is often accompanied by a slight velarization of the nasal, which happens in native words as well. I am writing all forms with this velarization as nasal vowels since phonemically that is what they are.
(119) Variation in nasal adaptation in WF coda position (Hollenbach 1973)

a. rough hair adj (Sp ‘pachón’) [machōː⁴] ~ [bachōː⁴] ~ [bachoː⁴]

Some cases of deletion seem to be lexically motivated and are found without word-final nasal unpacking in both sources of data.

(120) Lexically motivated deletion of nasality (Hollenbach 1973 & XEQIN)

a. John (Sp ‘Juan’) [waː⁴]

b. captain (Sp ‘capitán’) [witaː⁴]

c. cotton (Sp ‘algodón’) [gotoː⁴]

In the XEQIN data, many cases of apparent deletion are due to resyllabification across word boundary in rapid speech, especially when the onset of the next word was also an alveolar nasal. For example, when copulative ‘ne³’ is used, it can cause the word-final nasal coda to cross word boundaries as in 121.

(121) Resyllabification of nasal coda across word boundary

… ni³ trombo⁴ ne³

… pl trombone and

“…trombones and”

No pattern can be established for how and why deletion of word-final nasal happens in Hollenbach’s data.

(122) Deletion of Nasal in WF coda (Hollenbach 1973)
In conclusion, the alveolar nasal is adapted as the Triqui alveolar nasal which has an identical pronunciation. When it is in onset position, it is consistently produced as an alveolar nasal consonant with few exceptions. In word-medial codas, it is usually resyllabified and creates a prenasalized segment in the onset of the next syllable; however, this is often problematic when union with the following consonant would create an illicit segment (n + f or n + r) especially when the nasal coda is in an onsetless first syllable. The creation of N + O segments is further supported by a strong tendency for the obstruent to voice and sometimes devoice in this context. In word-final position, the alveolar nasal consonant deleted but the nasality often spreads leftward onto the preceding vowel. In the XEQIN data, there was also a tendency for the word-final nasal coda to resyllabify to the next word.

77 This tendency is a very salient feature of Triqui and is a salient feature of Triqui Spanish as well.
4.6.2 Triqui sibilants in coda position: Vr# and Vs#

Adaptation patterns of Spanish /ɾ/ and /s/ in word-final coda position is quite different from that of sonorants. While sonorants /l/, /n/, and /m/ are typically deleted in word-final position or delete with leftward spreading of nasality, the /ɾ/ and /s/ follow a different set of rules. The literature outlines a consistent way of parsing the repairs to loans with word-final sibilant codas. If the final syllable does not have primary stress, the sibilant is deleted, if the final syllable carries primary stress then the sibilant is maintained through word-final vowel epenthesis.

4.6.2.1 Sibilant /s/ Codas

Table 4.18 below shows all contexts where vowel epenthesis after a sibilant takes place: inbetween sibilant and consonant and word finally. In Hollenbach's data epenthesis occurs after a word-final sibilant and also as a strategy for breaking up a VsC sequence. For example, Easter (Sp 'Pascua') is realized as [bazikwa⁴] and cross (Sp 'cruz') is realized as [ɾe³se¹]. This restriction is no longer present in data taken from XEQIN; in fact, this data source shows quite the opposite and sequences of VsC are not only licit, they are often created as a product of vowel deletion in the context of words with VsVc sequences. This lack of epenthesis in newer adaptations is significant in the adaptation of sibilants since in both cases (VsC and Vs#) a voiceless sibilant will be produced.

Table 4.18. Epenthesis in data sources by linguistic context

<table>
<thead>
<tr>
<th></th>
<th>Hollenbach (1973)</th>
<th>XEQIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>VsC</td>
<td>21/33</td>
<td>0/43</td>
</tr>
<tr>
<td>#sV</td>
<td>0/32</td>
<td>0/73</td>
</tr>
<tr>
<td>VsV</td>
<td>0/43</td>
<td>0/76</td>
</tr>
<tr>
<td>Vs#</td>
<td>8/16</td>
<td>1/15</td>
</tr>
<tr>
<td>CsV</td>
<td>0/9</td>
<td>0/25</td>
</tr>
<tr>
<td>CsC</td>
<td>0/0</td>
<td>0/1</td>
</tr>
</tbody>
</table>
There are 29 instances of this particular linguistic context in the entire dataset. While this is not enough to prove absolute patterns of adaptation, there is certainly a high degree of faithfulness to this rule in Hollenbach’s data. Only three lexical items, marked by an asterisk show deletion where epenthesis should occur.

(123) Deletion in word-final coda (Hollenbach 1973)

a. pencil (Sp 'lápirz') [lape⁴]
b. cigarettes (Sp 'alas') [ala⁴]
c. place name (Sp 'Amuzgos') [musgo⁴]
d. place name (Sp 'Mesones') [mesõ:⁴]
e. Friday (Sp 'viernes') [werine⁴]
f. *chalk (Sp 'gis') [hii⁴]
g. *rice (Sp 'arroz') [aruu⁴~[garuu⁴]
h. *Saint Thomas (Sp 'Tomás') [damã:⁴]

The results from the XEQIN data are much more varied. In this data source, deletion is the least common adaptation strategy as can be seen in 124 below. Of the words that show word-final sibilant deletion, two follow the more traditional adaptation, and one, 124a, is most likely due to in part to the Spanish input where a word-final consonant cluster like Vps would not be consistently pronounced.
(124) Deletion in word-final coda

a. DIPS (government program) [diφ⁴]
b. birthday wish (Sp 'mañanitas') [māyanita⁴]
c. Friday (Sp 'viernes') [βyerne⁴]

Examples of maintenance of a word-final sibilant coda in the two data sources are pretty common. In Hollenbach’s data word-final sibilant maintenance is achieved through word-final vowel epenthesis.

(125) Maintenance in word-final coda (Hollenbach 1973)

a. cross (Sp 'cruz') [ru³ze¹~[ru³se¹]
b. judge (Sp 'juez') [gwe³se¹]
c. God (Sp 'dios') [ndio³se¹~[dio³se¹]
d. Saint Andrew (Sp 'San Andrés') [zandre³se¹]
e. Jesus voc. (Sp 'Jesús') [zu⁴se²]

The XEQIN radio data shows four types of maintenance. First, although now infrequent, there was one example of maintenance through epenthesis as in 126a. Since this same word shows up in Hollenbach’s data, it may be that this is a fossilized pronunciation. The second form is maintenance (or possibly resyllabification) due to the presence of a declarative marker a³ as in 126b, which would normally be realized as [santaku³se¹ a³2]. The next type of maintenance is the maintenance of the sibilant without any changes to syllable structure. This is the most faithful to the input form as seen in 126(c-i). The final and most innovative type of maintenance happens when the final sibilant is not only maintained but also lengthened as seen in 126(j,k). For example juez (Sp 'juez') is
sometimes realized as [hwess4] and gasoline as [gass4] (see spectrogram below). The tone pattern in these words will be discussed further detail in chapter 5.

(126) Maintenance in word-final coda (Hollenbach 1973)

Epenthesis

a. Andrew (Sp 'Andrés') [andre3se1]
b. town (Sp 'Santa Cruz') [santakrus4 a32]

Maintenance

c. government program (Sp 'DIPS') [dips4]
d. last name (Sp 'Flores') [flores4]
e. Carlos [karlos4]
f. place name (Sp 'Castañadas') [kastĩŷadas4]
g. guarantees (Sp 'Guarantías') [garandias4]
h. birthday wishes (Sp 'Mañanitas') [māŷanitas4]
i. Phoenix, Arizona [finis4]

Maintenance with lengthening

j. judge (Sp 'juez') [hwes:4]
k. gasoline (Mex Sp 'gas') [gas:4]

The following is a spectrogram of the loan for juez ‘judge’ taken from the XEQIN data.

From this spectrogram we can see that this lengthening is pretty significant.
4.6.2.2 Rhotic /ɾ/ Codas

The Spanish rhotic flap behaves similarly to other sibilants in coda position. In Hollenbach’s (1973) data, there is one example of vowel epenthesis triggered by the presence of a word-final sibilant in a syllable with primary stress and a change in tone pattern (further discussed in chapter 5).

(127) Vowel epenthesis in Vr# (Hollenbach 1973)

a. par ‘pair’ → [wa³ɾe¹]

XEQIN Radio data had 47 words with an ‘r’ in this context. The most common adaptation strategy is deletion with 25 instances followed by 14 instances of maintenance, 5 instances of trill, and 3 instances of retroflex sibilant. While no cases of word-final vowel epenthesis were found in the XEQIN radio data, there is a higher degree of maintenance and increased fortis pronunciation in word-final position when the final syllable has primary
stress. As with the sibilants, this often is accompanied by a stronger pronunciation of the rhotic as a retroflex sibilant or trill as seen in 128.

(128) Fortis pronunciation of ‘r’ in word-final position

| a. New York (Sp 'Nueva York') | nweβayos⁴ |
| b. kindergarten (Sp 'kinter') | kinteš⁴ |
| c. military (Sp 'militar') | militar⁴ |
| d. player ('lector') | le.to⁴ |

Lastly, there are 25 cases of deletion in XEQIN, 15 of which are verbs which are most likely taken from the third person singular or imperative of a Spanish verb which has no coda consonant rather than the infinitive. Triqui has relatively few verbs with no way of deriving verbs from other parts of speech (Hollenbach 1973).⁷⁸ Traditionally they have taken verbs from Spanish for use with a Triqui root. For example, the word for earning a living in Spanish is *ganar*. When the Triquis started to venture out into field work and other types of migrant labor, they borrowed this verb applying Triqui stress and vowel length to make /ga.nã:/⁴. Finally, they linked this Spanish verb with a native verb, in this case ‘ʔyah³’, whose closest translations are ‘to do’ or ‘to make’. The final result is /ʔyah³ ganã⁴/, to make a living.⁷⁹

Of the 10 nonverb items that exhibit word deletion of r codas, 3 are different.

⁷⁸ The input form for the adaptation of verbs has not been determined. This would be a fruitful area for study.

⁷⁹ While linking the verb to a Triqui verb is the most common way of using these loan verbs, more recently Triquis have started to use the Spanish verb without the Triqui verb. It is unclear how they mark tense, person, and aspect without the Triqui modifier.
versions of the same town name (Oxnard, California), which is most likely deleted or severely weakened even in the Spanish input form. One is a verb used as an adjective (máquina de fumigar), which follows different rules for segmental adaptation, and two also appear in other areas of the corpus as examples of maintenance as seen in 129.

(129) Variation of ‘r’ word finally in XEQIN Radio

<p>| | | |</p>
<table>
<thead>
<tr>
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<tbody>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. cellular phone (Sp 'cellular’)</td>
<td>[selular₄]<del>[selulaʂ₄]</del>[selula₄]</td>
<td></td>
</tr>
<tr>
<td>b. doctor (Sp 'doctor’)</td>
<td>[dotoo₄]~[dotor₄]</td>
<td></td>
</tr>
<tr>
<td>c. better (Sp 'major’)</td>
<td>[mehor₄]~[mehor₄]</td>
<td></td>
</tr>
</tbody>
</table>

Below are two spectrograms of the loan for doctor. The first (Figure 4.6) is a recording done by a monolingual Triqui speaker. In this example the declarative marker ‘a’ is missing but the trill-like pronunciation in word-final coda remains. The second spectrogram (Figure 4.7) is a recording done by a balanced bilingual. In this case the declarative marker a is present. In this context the rhotic receives a stronger pronunciation and seems to also be checked by an aspirated laryngeal (this laryngeal check is discussed more in chapter 5).
While the behavior of sonorants and sibilants in coda position may not directly affect the importation of Spanish phonemes in Triqui, it can provide some insight into Triqui that is otherwise undiscoverable using only native lexical items. In particular this data leads
us to question the role of perception in maintenance of coda segments and the status of coda consonants in underlying lexical forms.

4.7 Phonemic Borrowing in Triqui: Conclusions and Further Research
This chapter has reviewed the adaptation patterns of Spanish phonemes into Triqui. There are many consonants that these two languages share including d, g, t, k, l, m, n, r, s, and y. In onset position, these sounds are brought in with little trouble. Once there, they are subject to native rules of voicing, tensive, and laxing. In coda position, they are most often deleted although the sibilants seem to show the strongest preference for word-final maintenance through vowel epenthesis or maintenance with lengthening in modern adaptations.

Consonants that are not considered native phonemes in Triqui include b, p, f, h, ñ, and ‘rr’. All these sounds show varying levels of importation in Triqui. Some entered relatively quickly (p, h), others show signs of entering in modern Triqui (b), and others seem to only be present in the nonce-borrowings of competent bilinguals and cannot yet be considered to be productively used in Triqui (f, ñ). Finally, the ‘rr’ is most likely a sound that has always existed in Triqui but is now coming to be used more productively because of internal shifts rather than because of external motivations.

The idea that the ‘gaps’ in the structure of the phonemic system of Triqui allows for some sounds to enter has some merit. The bilabials complement an already established pattern of voicing and devoicing in alveolar and velar obstruents. Similarly, the rhotic finishes off the tense and lax tendencies of sibilants. The aspirated laryngeal is brought in line with the behavior of its laryngeal counterpart, the glottal. This leaves only the labiodentals fricative and palatal nasal, neither of which has an existing native pattern to
which to attach itself. The use of these sounds in isolated loans, however, can be expected
to have little influence on Triqui as a whole. Instead, one must examine the overall
structure of the recipient language to see how the incorporation of donor language
phonemes might influence the phonemic system as a whole.

The influence of Spanish on the phonemic system of Triqui, therefore, cannot be
understood at the level of individual phonemes; rather it should be understood at the
systemic level. This is especially prevalent in obstruents, sibilants, and laryngeals. In the
case of bilabials, it can be predicted that it will become more and more difficult to
maintain the coexistence of bilabial obstruents, which fit into a more general system of
velar and alveolar obstruents, alongside a system of one bilabial archiphoneme with three
allophonic realizations, /B/ [p]~[b]~[β]~[w]. The incorporation of Spanish voiced and
voiceless bilabials will most likely replace the old system, as seen in Table 4.19 below,
which in turn will spread outside of loanwords to the realization of native words (as
described above).

<p>| Table 4.19 Possible shift in obstruents in Copala Triqui |
|---------------------------------|-----------------|--------------|</p>
<table>
<thead>
<tr>
<th>Alveolar</th>
<th>Velar</th>
<th>Bilabial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precontact</td>
<td>/t/ [t] [d]</td>
<td>/k/ [k] [g]</td>
</tr>
<tr>
<td></td>
<td>/d/ [d] [t]</td>
<td>/g/ [g] [k]</td>
</tr>
<tr>
<td>Future</td>
<td>/t/ [t] [d]</td>
<td>/k/ [k] [g]</td>
</tr>
<tr>
<td></td>
<td>/d/ [d] [t]</td>
<td>/g/ [g] [k]</td>
</tr>
</tbody>
</table>

On a similar note, the increased use of alveolar rhotics creates a similar possibility for the
sibilants. As the alveolar trill starts to replace the retroflex sibilant in loanwords and native
words, it would bring the sibilant system to three places of articulation as well.
Table 4.20 Possible shifts in sibilants in Copala Triqui

<table>
<thead>
<tr>
<th></th>
<th>Alveolar</th>
<th>Alveolar</th>
<th>Palatal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before</strong></td>
<td>/s/ [s] [z]</td>
<td>/ʃ/</td>
<td></td>
</tr>
<tr>
<td></td>
<td>/z/ [z] [s]</td>
<td>/ʒ/</td>
<td></td>
</tr>
<tr>
<td><strong>Future</strong></td>
<td>/s/ [s] [z]</td>
<td>/ʃ/</td>
<td></td>
</tr>
<tr>
<td></td>
<td>/z/ [z] [s]</td>
<td>/ʒ/</td>
<td></td>
</tr>
</tbody>
</table>

Finally, the use of the aspirated laryngeal complements the use of the glottal laryngeal as a prosodic feature in word-final coda, as well as a segmental feature in onset position.

Future research should focus on realization of obstruents, especially bilabials, and rhotics, and should take into consideration both native words and loanwords in the natural speech of monolingual and bilingual speakers of different ages to see whether the tendencies can be found outside of loanwords.
Chapter 5

Prosodic Features of Loanwords

5.1 Introduction

In one paragraph, Hollenbach (1973) outlines at least three areas of possible focus regarding adaptation of prosodic elements of loanword adaptation. 1) Pre-existing native patterns of tone are used rather than creating an innovative tone pattern, 2) which in turn, gives prominence to less common tone patterns, and 3) the shape of the native syllable is not changed. Illicit features such as coda segments are consistently remedied through a variety of strategies.

Los préstamos del español no han cambiado la estructura prosódica de las palabras triquis; en cambio, los préstamos se han adaptado a los patrones de tono, cantidad y nasalización del trique. Sin embargo, los préstamos han aumentado en gran número las palabras con ciertos patrones prosódicos. Los préstamos tampoco han introducido otras consonantes que puedan ocurrir al final de una palabra. Las consonantes finales en los préstamos se pierden sin dejar huella; o se pierden dejando su huella en la nasalización; o pierden la posición final, agregando un vocal. (Hollenbach 1973: 85)

This chapter explores the assignment of tone in Spanish loanwords in Copala Triqui. As part of this, it sets out to answer three specific questions:

First, what are the actual prosodic representations of loanwords in Triqui? Exploration of the literature on Triqui (Hollenbach 1973, 1984, 2005a,b) shows four basic patterns of adaptation. Further examination of the same literature and the representation of phonetic processes known to influence realization of tone (F1 and F2
rules) will give additional insight into the underlying forms of these words. This section also confirms that loans do indeed conform to native tone patterns. Each loan is what Hollenbach considers a complex word, which means it has more than one syllable with lexically linked tone. Complex words are thought to represent 20% of Triqui vocabulary (Hollenbach 1984) and the increasing levels of contact indeed causes minor tone patterns to become more prominent, especially in the case of loans taken from Spanish inputs with penultimate stress, which is the least marked pattern of stress in Spanish.

As the patterns of Spanish loanword adaptation in Triqui indicate a strong relationship between Spanish stress and Triqui tone, the following section attempts to identify a set of rules to explain how the stress of the input form translates into Triqui tone.\textsuperscript{80}

Finally, the previous chapter shows how segmental adaptation has changed over time; prosodic adaptations also show signs of variation. Data collected from elicitation sessions indicates that there are two shifts in place related to loanword adaptation; one is internally motivated and the other appears to be externally motivated, triggered by increased access to native Spanish phonotactic rules. The second, more externally motivated, change may support claims that "faithful preservation of the input language

\begin{flushleft}
\textsuperscript{80} Recent literature on loanwords shows that, most often, the stressed syllable of a stress accent language is translated into a high or mid tone in a recipient language (Kang 2010; Kenstowicz & Suchato 2006). The method by which this occurs is still not well understood.
\end{flushleft}
stress position, by way of segmental alteration or by importation, is more likely to occur when the language contact is more direct and intimate” (Kang 2010: 2).

5.2 Underlying Tone in Spanish Loans

5.2.1. Internal Factors Influencing Tone Realization in Triqui

This section gives a detailed analysis of the different types of loans and attempts to identify the phonological representations that underlie each type of loan (there are four in all). Two processes, one phonetic and one morphophonetic, will be used to support these claims.81 These processes make description of these loans easier because they call for predictable changes from one tone to another and they affect simple and complex words differently. The first process affects nonfinal lexically linked tone by limiting the tones allowed in this position. The second process is the tone shift that accompanies certain morphophonetic changes. Hollenbach calls these processes ‘formatives’ and outlines three types: formative 1 (F1), formative 2 (F2), and formative 3 (F3) (See chapter 2, section 2.3.7 for a description of each). Each formative describes the shift in tone rather than a specific morphological process, which is why I choose to use Hollenbach’s terminology. For example, F1 is primarily used in changing a verb from the completive/continuative aspect to the potential aspect and F2 is used in a variety of contexts including creation of the possessive from, a nonpossessive form and shifting a noun to an adjective (paper → papery, woman → female). A more complete description of the uses of these formatives with examples can be found in chapter 2 (section 2.3.7). This dissertation will make use of F2 changes that occur in the possessive form of loanwords.

81 A basic description of tone and stress in Copala Triqui can be found in Chapter 2.
Limiting of Tone in Nonfinal Syllables with Lexically Linked Tone

Complex words are composed of compound words and loanwords. In the case of compound words, the tone of the first word in the compound is reduced to a 2, 3, or 5 tone. For example, the Triqui word for shoe is /ka³nuh¹³/, which comes from the words /kanh³/ ‘sandal’ and /nuh¹³/ ‘of leather’. The Triqui word for tobacco probably shows the change a little better, the compound /ko³n¹³/ ‘tobacco’ comprises /koh³²/ ‘plant’ and /nuh¹³/ ‘of leather’. According to Hollenbach, the tone of the nonfinal lexically linked syllable changes in a predictable way as can be seen in 131 below.

(131) Tone shifts in head of compound (Hollenbach 1984: 253)

a. 1 & 2 → 2
b. 3, 4, 32 → 3
c. 5 → 5
d. 31 → 31,
e. 13 → 2

Interestingly, Hollenbach indicates that Spanish loans in Triqui belong to this category even though they are not created through the compounding of two words. Since the output of nonfinal syllables with lexically linked tone will most likely be a 2, 3, or 5 tone, this process will make it possible to posit different underlying tones in these loans. Basically, a

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82 Unfortunately, Hollenbach does not give an example where the lexically linked tone of the nonfinal changes. All of her examples are of words where the first half of the compound already has a 2, 3, or 5 tone.

83 Hollenbach states that no examples have been found of 31 → 31 and 13 → 2 and is only speculating.
loan that has a lexically linked nonfinal tone of 3 (as is true in loanwords) could indicate an original mapping of that tone to an underlying 3, 32, or 4 tone according to the chart above. The next section gives a more detailed description of how this process works.

**F2 Changes in Possessive Form of Complex Words**

One use of formative 2 (F2) is to change a word from the unpossessed to possessed form by passing through a series of predictable tone changing rules reviewed in Table 5.1 below (See section 2.3.7 for a basic description of F1).

<table>
<thead>
<tr>
<th>No laryngeal</th>
<th>?</th>
<th>h</th>
<th>!</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>13</td>
<td>13?</td>
<td>13!</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>R</td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>1h</td>
<td>5</td>
<td>1h</td>
</tr>
<tr>
<td>31</td>
<td>1</td>
<td>X</td>
<td>R</td>
</tr>
<tr>
<td>32</td>
<td>2h</td>
<td>2h</td>
<td>2!</td>
</tr>
</tbody>
</table>

What is not represented in the table above is the application of F2 to complex words. This is more relevant to loanwords as many are transcribed with lexical tone on a nonfinal syllable. In these complex words, the final syllable remains unchanged and the nonfinal syllable with lexically linked tone undergoes a tone change. According to Hollenbach, this is because the nonfinal syllable with lexically linked tone corresponds to the original head of the phrase, and the second part corresponds to the original modifier. This results in the replacement of the linked tone pattern of complex words by tone 2, which is the only [-

---

84 While F2 is used for a variety of other morphological processes, the shift from the declarative to the possessive form is the one that is most useful for eliciting loanword data that is comprised primarily of nouns representing objects.
HIGH] tone that occurs alone in nonfinal syllables (Hollenbach 1984). As can be seen in 132 below, lexically linked tone is limited to a 2, 3, or 5 tone in the unpossessed form and changes to a 2 tone in the possessed form leaving the tone of the final syllable untouched.

(132) F2 changes in words with lexically linked tone (Hollenbach 1984)

a. V3V4

\[\text{Me}^3\text{sa}^4 \text{‘table’}\]

\[\text{se}^{32} \text{me}^2\text{sa}^4 \text{‘table of’ (Sp ‘mesa’)}\]

b. V3V1

\[\text{cha}^3\text{na}^1 \text{‘woman’}\]

\[\text{se}^{32} \text{cha}^2\text{na}^1 \text{‘female’}\]

c. V5V32

\[\text{sno}^5\text{?o}^{32} \text{‘man’}\]

\[\text{sno}^2\text{?o}^{32} \text{‘male’}\]

It might be argued that the unpossessed form of 132a and the adjective form of 132b could also be derived through tone epenthesis rules; however, if we take these three forms as a whole, it becomes pretty clear that the nonfinal in complex words keeps its lexically linked tone in both the possessed and unpossessed format. Furthermore, as seen in 132a, when there is no lexically linked tone, the final syllable participates in F2 rules and the

\[85\text{In her dissertation Hollenbach describes Triqui tone as having three features [HIGH], [CENTRAL], and [EXTREME] in order to manage this 5 tone system. Tones 3, 4, and 5 are considered [+HIGH]. Her feature matrix can be found on page 97 of Hollenbach (1984).}\]
nonfinal syllable changes to a 2 tone following tone epenthesis rules.

(133) F2 changes in words with lexically linked tone (Hollenbach 1984)

a. ‘huipil’ roʔo\(^4\) → roʔno\(^1\) [roʔ\(^2\)no\(^1\)]

Similar patterns can be found in other examples of tonal morphology in Copala Triqui. For example, verbs that start with the causative marker ‘t’, although not indicated as having lexically linked tone in the continuative aspect, show similar patterns as seen in the possessives above in the potential aspect. It could be argued that the causative marker carries its own 3 tone.

(134) Examples of verbs from continuative aspect → potential aspect

a. ‘shake’ tukuno\(^4\) → tu\(^2\)kuno\(^4\)

b. ‘trip’ tíje\(^4\) → ti\(^2\)je\(^4\)

c. ‘paint’ tirno\(^4\) → ti\(^2\)rno\(^4\) (rno\(^4\) = to be painted)

In sum, Copala Triqui has two processes that affect realization of tone that are relevant to determining the underlying tone of loanwords. First, the tone of nonfinal syllables with lexically linked tone is reduced in a predictable way. Second, lexical items, as they pass from an unpossessed to possessed format, go through a series of predictable tone changes. These changes are different for complex and simple words, which will make it easier to determine if loans are indeed considered complex words.
5.2.2. Stress in Spanish

In order to understand the influence that Spanish prosodic structure may have on these loanwords in Triqui, it will first be helpful to take a closer look at how stress, syllable length, and pitch behave in the Spanish target words.

Spanish has only three possible types of stress: ultimate, penultimate, and antepenultimate. Metrical feet are bimoraic, left headed (trochaic), and formed from the right (Lipski 1997: 560). In addition, primary stress must be in the final foot. This is not problematic for words with ultimate and penultimate stress. In words with final stress, this often has one final heavy syllable created either through a rising diphthong as in 135a or a closed syllable as in 135b. Words with penultimate stress have one metrical foot with two light syllables as in 135c or one closed penultimate followed by a light syllable that is placed outside the metrical foot as in 135d.

(135) Ultimate and penultimate stress \( (H = \text{heavy}, \ L = \text{light}) \)

a. ultimate \([L(H)]\) karai [ka.(rai)]

b. ultimate \([L(H)]\) capitán ka.[pi.(tan)]

c. penultimate \([LL]\) mesa [(me.sa)]

d. penultimate \([H]L\) cansa [(kan).sa]

Words with antepenultimate stress would seem to be a counterexample. In order to support claims that Spanish only assigns primary stress in the final foot of the word, it has been claimed that words with antepenultimate stress have a trisyllabic but bimoraic root in which the penultimate syllable is essentially invisible as in 146\(^{86}\) (Piñeros 2000a).

(136) Words with antepenultimate stress \( (\text{proparoxytone}) \)

a. proparoxytone \([L \ (LLL)]\) [te (le. <fo>.no)]

\(^{86}\) For an earlier theory see Harris (1992).
Some evidence to support this include the lack of prominence of the penultimate syllable, the tendencies of certain dialects to delete the penultimate in words like *muchísimo* ‘a lot’, which becomes [mu.chí.smo], and the truncation of paroxytone bases to include the antepenultimate and ultimate syllables as in 147 below (Piñeros 2000b).

(137) Truncation of proparoxytones (Piñeros 2000b)

a. Hipólito ➔ Polo (not poli)

b. Aristóbulo ➔ Tobo (not tobu)

c. Mélida ➔ Mela (not meli)

Besides occurring in one of the final three syllables, the stressed syllable is an anchor point for intonation events and is marked by higher pitch, longer duration, and greater intensity than other syllables (Hualde 2005). While it is generally assumed that trochaic systems, like Spanish, do not lengthen the stressed vowel (Hayes 1989), some have argued that lengthening is found in trochaic systems irrespective of whether they support quantitative contrasts or not, as is the case in Greek and Swedish (Revithiadou 2004). Navarro Tomás (1916, 1917, 1918, 1922) has claimed that Spanish is uneven in the duration of syllables but accentuated feet remain stable. Although syllable length is not important phonemically, it would seem that there is some phonetic lengthening of stressed syllables and, for the purpose of this study, I will consider stressed vowels to be long and

---

Studies have found that Spanish speakers cue in on intensity, pitch, and length to determine stress and that each factor in isolation was not sufficient for determining stress. In addition, sentence-level prosody can affect pitch significantly in Spanish (Llisterri et al 2003; Ortega-Llebaria, Prieto, & Vanrell 2008).
unstressed vowels as short since Copala Triqui is sensitive to vowel length and will most likely pick up on these minor differences.

In sum, Spanish assigns stress in one of the final three syllables lengthening stressed syllables. The lengthening and rise in pitch of stressed syllables is not phonemic—Spanish does not differentiate between long and short vowels or geminate and simple consonants—however, the phonetic presence of a higher, slightly more elongated syllable should be significant for Triqui, which does have a phonemic distinction for length in vowels and pitch/tone on syllables. The following sections look at how Triqui adapts each stress pattern in Triqui. With the exception of words ending in a sibilant coda, there is a strong connection between the stress of the Spanish input and the tone of the Triqui output form.

5.2.3. Autosegmental Analysis
The goal of this section is to gain a better understanding of what tones are actually being used in each type of loan. The examples below represent how a monolingual with no access to Spanish phonotactic rules might interpret these words once they are established in the Triqui lexicon and not the process by which adaptation may have occurred, which is the focus of the next section; or evidence of variation and language shift, which will be covered in the final section of this chapter. Loanwords in many language descriptions are often given little detailed analysis or even left out completely. In the case of Copala Triqui, they have not been the focus of any detailed study (Hollenbach 1973, where they are listed with relatively little analysis, is an exception) but they certainly have not been ignored and there are plenty of examples to draw from.

The following sections will take a closer look at each type of loan found in the
literature (Hollenbach 1973, 1984, 2005a) and posit an underlying form for each.

Following Hollenbach (1984) I start off with an underlying form that has no preliminary tone association unless a nonfinal lexically linked tone exists. The primary association links the primary tone to the final syllable and any other tone is also associated with the final syllable in order to fulfill no-crossing rules. This no-crossing rule is the source of contour tones but it is not relevant in the case of loanwords that do not have contour tones.

Next Hollenbach posits a tone epenthesis rule that creates what she calls a ‘bleached’ version of the final tone. In the case of mid to high tones, the epenthetic tone is a 3 tone; in the case of low tones the epenthetic is a 2 tone. Finally, there is a convention 2 rule that associates this epenthetic tone with all vowels that do not have an associated tone.

**Loans Taken from Spanish Input with Ultimate Stress**

In the literature, there are some inconsistencies in how this type of loan has been transcribed. In the unpossessed form there is a nonfinal vowel with tone that is epenthetically derived and a long final vowel with a 4 tone or V.VV4. For example, the word for rice (Sp 'arroz') is written /a.ruu⁴/ in this form. This would indicate that the underlying representation of this word is as follows:

<table>
<thead>
<tr>
<th>Underlying form</th>
<th>4</th>
<th>‘rice’ (Sp ’arroz’)</th>
</tr>
</thead>
<tbody>
<tr>
<td>aruu</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initial association</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>aruu</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No crossing</th>
<th>NA</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Epenthesis</th>
<th>3 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>aruu</td>
<td></td>
</tr>
</tbody>
</table>

179
If this is the case, the possessive form of this word should be V.VV1 or /se$^{32}$ a.ruu$^1$/. Hollenbach, however, only gives one example of this type of loan in the possessive and it is represented as /se$^{32}$ a$^2$.ruu$^4$/ (Hollenbach 2005a). This seems to indicate that oxytones have a lexically linked nonfinal syllable even if Hollenbach does not indicate this in the unpossessed form. The underlying representation of this type of loan would then be the following:

<table>
<thead>
<tr>
<th>Underlying form</th>
<th>3 4</th>
<th>‘rice’ (Sp ‘arroz’)</th>
</tr>
</thead>
<tbody>
<tr>
<td>aruu</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initial association</th>
<th>3 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>aruu</td>
<td></td>
</tr>
</tbody>
</table>

| No crossing | NA |

| Epenthesis | NA |

Since the 4 tone is associated with a long vowel in the output form the phonemic representation of this word would be /a$^3$.ruu$^4$/ and phonetic representation of this word then would be [a$^3$.ruu$^{3d}$].

**Loans Taken from Inputs with Penultimate Stress**

Paroxytomes show some inconsistency in how they are transcribed, which could indicate errors in transcription, relatively free variation in how the word can be pronounced, or possibly a shift in progress. In Hollenbach’s dictionary and other publications, the final syllable is always written as a short vowel with a 4 tone. The nonfinal syllable, however,
is sometimes written with a lexical 3 tone as in V3.V4 and sometimes is not, as in V.V4. This lexically linked 3 tone is always found on the penultimate syllable, even in words with three or more syllables like /ko.pə³.lə⁴/ from Copala, the Spanish name for the town for which this dialect is named (Hollenbach 1992: 211). This inconsistency is also seen in the possessive form which is written as V2V4 or V2V1. This variation seems to indicate two valid forms exist.

(138) Paroxytones in declarative and possessive (Hollenbach 2005a)

<table>
<thead>
<tr>
<th></th>
<th>Declarative</th>
<th>Possessive</th>
</tr>
</thead>
<tbody>
<tr>
<td>machete (Sp 'machete')</td>
<td>/mifɛ⁴/</td>
<td>/se³² miʃte⁴/ ~ /se³² miʃte¹/ ~ /smiʃte¹/</td>
</tr>
<tr>
<td>story (Sp 'cuento')</td>
<td>/kweⁿto⁴/</td>
<td>/se³² kweⁿdo⁴/ ~ /se³² kweⁿdo¹/</td>
</tr>
<tr>
<td>mango (Sp 'mango')</td>
<td>/ma.ngo⁴/</td>
<td>/se³² ma.ngo¹/ ~ /se³² maⁿgo⁴/</td>
</tr>
</tbody>
</table>

One option is to assume that loans in this category do not have a nonfinal syllable with lexically linked tone but rather that tone is derived epenthetically.

Underlying form 4 'Copala'

kopala

Initial association 4

kopala

No crossing NA

Epenthesis 3 4

kopala

Convention 2 3 4

kopala
The phonemic representation of the second version would be /ko.pa.la^4/ and the phonetic realization would be [ko^3.pa^3.la^4^3].

Alternatively, if we assume that this category of loan has nonfinal syllable with lexically linked tone, then the underlying representation would be the following:

Underlying form

\[
\begin{array}{c}
\text{3} \\
\text{4} \\
\text{kopala}
\end{array}
\]

‘Copala’

Initial association

\[
\begin{array}{c}
\text{3} \\
\text{4} \\
\text{kopala}
\end{array}
\]

No crossing

NA

Epentheses

\[
\begin{array}{c}
\text{3} \\
\text{3} \\
\text{4} \\
\text{kopala}
\end{array}
\]

Convention 2

\[
\begin{array}{c}
\text{3} \\
\text{3} \\
\text{4} \\
\text{kopala}
\end{array}
\]

The phonemic representation of this word would be /ko.pa^3.la^4/. Since the word has three syllables there will be tone epentheses and, since the final syllable is short, the 4 tone will most likely be realized with a 43 downglide as in [ko^3.pa^3.la^4^3].

I believe that, as was the case with the words taken from inputs with ultimate stress, the underlying representation for loans of this type contains lexical tone on the nonfinal, at least in its original form. It is most likely that both versions are correct but that the first version represents a more conservative form and the second a more innovative/simplified form that has developed over time. Each would have a different possessive tone pattern, the more conservative form would be V2V4 and the newer,
simplified form would be V2V1.

Loans Taken from Inputs with Antepenultimate Stress
Hollenbach gives only a few examples of these types of loans in her publications because these types of words are less prevalent in Spanish. As can be seen, the stressed syllable of the Spanish input is maintained as a mid tone in Triqui. It is of note that the Spanish input is given a 3 tone instead of a 4 tone as was the case in oxytones and paroxytones. The final syllable is realized with a 1 tone.

(139) Proparoxytöne loans in Triqui (Hollenbach 2005a)

a. orchestra (Sp 'música') mi$^{3}$ska\textsuperscript{1} (2005:16)
b. machine (Sp 'máquina') ma$^{3}$kina\textsuperscript{1}

While there are no examples of possessive forms of this type of loan in the literature, there are examples of native words with a similar format as can be see in 140 below. Interestingly, examples indicate that the lexically linked tone is neutralized in the possessive form and only takes distinctive tone when it takes on the 32 tone of the possessive marker se\textsuperscript{32} as can be seen in 140c below. We see some disparity in Hollenbach’s data concerning this particular form. Sometimes she claims that there is neutralization of the nonfinal tone and, at other times, the nonfinal tone is represented as shifting to a 2 tone.\textsuperscript{88} Either way the output would be the same; however, as was true above, it would seem that there is a more conservative form that maintains the lexically linked tone of the nonfinal syllable, which in turn changes from 3 to 2 tone when the word undergoes F2 tone shifts.

\textsuperscript{88} The neutralization of nonfinals in some forms will be addressed later in this chapter.
(140) Possessive form of V3.V1 native words (Hollenbach 2005a)

a. ‘shadow’ \[ka^3[fun^1]\] \(\rightarrow\) \[se^{32} kat[fun^1]\]

b. ‘word/air’ \[na^n[na^1]\] \(\rightarrow\) \[se^{32} na[na^1]\]

c. ‘chocolate’ \[ni^3[kee^1]\] \(\rightarrow\) \[s-no^3[nee^1]\] \~\[se^{32} nika^1]\]

d. ‘eyeglasses’ \[sko^3[ran^1]\] \(\rightarrow\) \[se^{32} skorana^1]\]

e. ‘nest’ \[sa^3[ka^1]\] \(\rightarrow\) \[se^{32} ska^1]\]

The underlying representation of words of this type is as follows:

<table>
<thead>
<tr>
<th>Underlying form</th>
<th>3 1</th>
<th>‘machine’ (Sp 'máquina')</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>makina</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initial association</th>
<th>3 1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>makina</td>
</tr>
</tbody>
</table>

| No crossing | NA |

<table>
<thead>
<tr>
<th>Epenthesis</th>
<th>3 2 1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>makina</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Convention 2</th>
<th>3 2 1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>makina</td>
</tr>
</tbody>
</table>

Given all of the above, the phonemic representation of this word in its basic form would be \(/ma^3.ki[na^1]/\) and the phonetic realization would be \([ma^3.ki^2.[na^1]/\).

Loans Taken from Inputs with Ultimate Stress and Word-Final Sibilant
There is a small subset of loanwords that are taken from Spanish inputs with word-final stress that also end in a word-final sibilant coda. These loans have a similar form, as words taken from words with antepenultimate stress although most likely for different
reasons. In one there are two unstressed syllables at the end of the word, in the other the sibilant coda of a word-final stressed syllable forces the epenthesis of a final mid vowel and therefore the formation of an additional syllable. From the examples in 141 below, it is clear that Hollenbach assigns a 3 tone to the stressed syllable in Spanish and a 1 tone to the epenthesized form. Epenthesized syllables often do not take part in prosodic rules and tone and stress assignment (Kenstowicz & Suchato 2006; Broselow 1999) so it is not clear at this point what the status of the final syllable is.

(141) Examples of oxytones with word-final sibilant codas in Hollenbach.

a. God (Sp 'dios') tyo³se¹ (Hollenbach 1992)
b. pair (Sp 'par') wa³re¹ (Hollenbach 1973)
c. judge (Sp 'juez') we³se¹ (Hollenbach 1973)
d. cross (Sp 'cruz') re³se¹ (Hollenbach 1973)

Hollenbach does not indicate what these words should look like in the possessive form; however, if we are to assume that these loans take on a native tone pattern as claimed by Hollenbach, then they should behave similarly to native examples as outlined in the previous section. Basically, the lexically linked 3 tone of the nonfinal syllable should change to a 2 tone.

It would seem appropriate to assume that the loans taken from antepenultimate

89 It is strange that this form of loan would get a 3 tone instead of a 4 tone since the only thing that differentiates it from a regular oxytone is the presence of a word-final sibilant.
stress as well as the loans taken from words with ultimate stress and word-final sibilants have the same underlying form.

<table>
<thead>
<tr>
<th>Underlying form</th>
<th>3</th>
<th>1</th>
<th>'judge’ (Sp 'juez')</th>
</tr>
</thead>
<tbody>
<tr>
<td>wese</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initial association</th>
<th>3</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>wese</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| No crossing | NA |

| Epenthesis | NA |

| Convention 2 | NA |

There are two additional questions to think about for this type of loan. First, what are the properties of Triqui that cause it to create an epenthesized vowel/syllable in the case of word-final sibilants and delete the sibilant coda in all other cases? Second, what is the status of this epenthesized syllable and is it visible to the assignment of stress and tone? These questions will be looked at in more detail in the next section.

**5.3. From Spanish Stress to Triqui Tone**
The chart below includes loanword forms in the unpossessed and possessed forms as found in the literature. What is immediately apparent in the data below is that not only does Triqui faithfully adapt Spanish loanwords to native tone patterns (even if those patterns are somewhat marked), they are also adapted in a consistent fashion, directly correlating to stress patterns in Spanish.
The next sections will explain the adaptation process of these loans as they entered Triqui in their original forms.

5.3.1. A Rule-Based Account of Loanword Adaptation in Triqui
As mentioned above, examination of Hollenbach’s work (1973, 1984, 2005a,b) reveals four distinct patterns of loanword adaptation at the suprasegmental level. These four tone patterns are directly related to the stress pattern of the input word and, except for the case of oxytones with word-final sibilants, do not seem to be affected by segmental features. Patterns of tone assignment in established loans are consistent with no exceptions.90

Instead of looking at the underlying form of a loanword once established, this section will start to work backward to explore what the adaptation process must have looked like at the time of adaptation. There are also some assumptions to be clarified.

First, this analysis assumes that all stressed syllables are initially mapped onto a 4 tone no matter where they are in the word, and absence of stress in the final syllable correlates with 1 tone, as posited by Hollenbach. It also assumes that some illicit syllable structures

90 There is a more recent adaptation pattern that seems to maintain the stressed syllable of Spanish and assign a 32 tone with an aspirated vowel. This pattern has not been studied empirically and for that reason I am leaving it out of the more formal analysis of tonal adaptation. It will be examined at the end of this chapter.
such as restrictions on consonants in coda position are dealt with at the perceptual level (following Boersma & Hamann 2009) but are not visible to prosody in the perception phase. Finally, this analysis assumes that there is a production phase where native rules affect the output (in native words as well as loanwords).

--- input/perception ---

1. Fix syllable structure (*CODA), epenthetic syllables are not visible to prosody
2. All stressed syllables get 4 tone, if stress is in final two syllables then both get 4
3. Final syllables w/o tone get a default 1 tone

--- output/production---

4. All nonfinal lexical 4 tone gets reduced to 3 tone to as per native rules
5. Apply tone epenthesis to all toneless syllables as per native rules

Table 5.2. Application of rule based account of loanword adaptation (option 1)

<table>
<thead>
<tr>
<th></th>
<th>Ultimate</th>
<th>Penultimate</th>
<th>Antepenultimate</th>
<th>Ultimate stress w/ sibilant coda</th>
</tr>
</thead>
<tbody>
<tr>
<td>rice</td>
<td>/a³ruu⁴/</td>
<td>/me³sa⁴/</td>
<td>/ma³kina¹/</td>
<td>judge /we³se¹/</td>
</tr>
<tr>
<td><strong>Perception of the foreign input form</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fix syllable</td>
<td>aruu⁴</td>
<td>mesa³</td>
<td>makina¹</td>
<td>wes&lt;se&gt;</td>
</tr>
<tr>
<td>4 tone association</td>
<td>a'ruu³</td>
<td>me'sa³</td>
<td>ma'kina¹</td>
<td>we³&lt;se&gt;</td>
</tr>
<tr>
<td>1 tone association</td>
<td>NA</td>
<td>NA</td>
<td>ma'kina¹</td>
<td>we³&lt;se&gt;</td>
</tr>
<tr>
<td><strong>Switch to production of loanword</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonfinal lexical tone reduction</td>
<td>a³ruu³</td>
<td>me'sa³</td>
<td>ma'kina¹</td>
<td>we³ se¹</td>
</tr>
<tr>
<td>Tone epenthesis</td>
<td>NA</td>
<td>NA</td>
<td>ma'kina¹</td>
<td>NA</td>
</tr>
</tbody>
</table>

The one doubt that remains is whether loans taken from inputs with ultimate stress have a nonfinal lexically linked 3 tone /a³ruu⁴/ or if that 3 tone is derived epenthetically, /aruu⁴/. Since Hollenbach only gives one example of this type of loan in the possessive form, it is difficult to say. A second possible derivation assumes that the 3 tone of the
nonfinal syllable of these loans is epenthetically derived rather than lexically. The derivation for this would be similar to the one above. It still assumes that epenthesis and tone assignment happen at the perceptual level although epenthesized material no longer needs to be invisible to tone assignment. As with the derivations above, it assumes that high pitch in Spanish equates to a 4 tone and absence of high tone on the final syllable in Triqui, and low tone on the final syllable translate as 1 tone. Finally, the application of native phonotactic rules remains the same; nonfinal lexically linked tone changes to a 3 tone and tone of all remaining syllables is derived through tone epenthesis.

1. Fix syllable (*CODA)
2. All stressed syllables get a 4 tone (penultimates get a 4 tone on both)
3. Final syllables w/o tone get a default 1 tone
   --- switch to output/production---
4. All nonfinal lexical tone gets reduced to 3 tone to as per native rules
5. Apply tone epenthesis to all toneless syllables as per native rules

---

91 There is something special about loans taken from penultimates that cause tone to be assigned to two syllables. The next section on variation shows evidence to support this claim as well as the claim that all stressed syllables in Spanish are assigned a 4 tone.
Table 5.3. Rule-based account of loanword adaptation (option 2)

<table>
<thead>
<tr>
<th></th>
<th>Ultimate</th>
<th>Penultimate</th>
<th>Antepenultimate</th>
<th>Ultimate stress w/ sibilant coda</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice /aruu⁴/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Table /me³sa⁴/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine /ma³kina¹/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Judge /we³se¹/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Perception of the foreign input form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fix syllable</td>
</tr>
<tr>
<td>4 tone association</td>
</tr>
<tr>
<td>1 tone association</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Switch to production of loanword</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonfinal lexical tone reduction</td>
</tr>
<tr>
<td>Tone epenthesis</td>
</tr>
</tbody>
</table>

The next sections cover each step of the derivations above separately.

**Perception: Fix Syllable**
Both derivations agree on what segments trigger vowel epenthesis. Spanish allows n, l, r, and s in coda position while Triqui strictly forbids any segmental material in coda position. Word internally, the presence of these four segments is dealt with through resyllabification to the onset of the following syllable. Word finally, each segment is dealt with differently.⁹² The ‘l’ is almost categorically deleted. The ‘n’ is deleted but its nasality spreads leftward to create a nasal vowel. The ‘r’ and ‘s’, however, trigger epenthesis when the final syllable has primary stress and are deleted when it does not.

Where these derivations diverge is in the degree to which these epenthesized syllables are visible to prosody. Some studies call for exclusion of epenthetic material from prosodic rules. Alderete (1999) and Broselow (1999), for example, find that inclusion of epenthetic material tends to be forbidden in the main stress foot due to a (HEAD-DEP)

---

⁹² Please see the sections on these segments in chapter 4 for a more detailed description of this process.
constraint. Broselow, however, notes that inclusion of epenthesized material in prosodic rules (in her case stress) is avoided rather than categorically absent. At some point the epenthesized syllable is visible to prosody because the nonfinal changes to a 3 tone in the output form.

**Perception: 4 Tone Association**

The two derivations are similar in that they both assume that all stressed syllables in Spanish correlate to a 4 tone in Triqui. The five tone system in Triqui is a relatively recent phenomenon that was caused by the splitting of a 4 tone into 4 and 5 tones (Hollenbach 1984: 96). This would mean that originally the 4 tone was the highest tone.

Where these two derivations diverge is in how they assign 4 tone. Option one assigns assumes that Triqui speakers, as they were importing these forms, assigned 4 tone to the last two syllables if either of these syllables have stress in Spanish (which can only happen if epenthesized material is invisible to prosody or happens later in the process). The second derivation assumes that all stressed syllables get a 4 tone and that loans taken from inputs with penultimate stress have something special in the stress pattern in Spanish. This is supported by literature that shows a delay in pitch peak in words with penultimate stress (Llebaria 2006; Simonet 2006). Figure 5.1 adapted from Llebaria (2006), shows the delay in pitch in declarative sentence structure. In the top example, *Malena miraba la luna* or “Malena was watching the moon” shows three words with penultimate stress, each with delayed pitch. In the second example, only the first half of the sentence, *Miro la luna...* or “I am watching the moon…” is in the declarative.
This analysis assumes that Triqui adapters cue into this delayed stress/pitch peak in the adaptation process. This is also supported by newer adaptation patterns (covered in the next section) where less-conservative speakers of Triqui apply 4 tone to the two final syllables in the case of loans taken from input forms with penultimate stress.

**Perception: Low Tone Association**
Just as Triquis apply a 4 tone (originally the highest tone in the language) to syllables with stress, they apply a 1 tone to final syllables without stress. Since Triqui places so much information on the final syllable, it would be difficult to outline an analysis of tone adaptation that does give special attention to this syllable. I am thinking at this point that absence of perceived tone/stress is translated into a 1 tone.

**Production: Lexical Tone Reduction**
The two derivations agree here. Once all lexically linked tones are assigned, it is time to turn to some of the native processes that affect the output of an underlying form. All lexically linked tone in a nonfinal syllable must be reduced according to native rules (see
previous section for a more detailed description). According to these reduction rules all
the nonfinal syllables with a 4 tone are reduced to a 3 tone.

**Production: Tone Epenthesis**
Finally, if any syllable is still left without a tone, then native tone epenthesis rules come
into play assigning a 3 tone to all syllables preceding a lexically linked tone that is
[+HIGH] or a 2 tone to all syllables with tone that is [-HIGH]. The two derivations agree
here as well.

**Conclusion**
This section has outlined two ways in which Spanish stress could have translated into
Triqui tone as these words originally entered Triqui. The second version is the cleaner of
the two derivations although it works on the assumption that loans taken from oxytones
do not have lexically linked tone. While it may seem peculiar to assume that Triqui
speakers originally applied 4 tone to two syllables instead of one in the case of loans
taken from inputs with penultimate stress, there is evidence that the pitch of this class of
words may actually be delayed enough to be perceived as belonging to both syllables
due to word-boundary effects (Simonet 2006).

The next section looks at the prosodic adaptation of the four types of loans in the
speech of a younger and less conservative speaker of Triqui. It shows two sources of
variation, one internally motivated (simplification over time) and one externally
motivated (increased access to Spanish phonotactic rules). It also supports some of the
innovative findings of chapter 4 such as word-final sibilant maintenance without vowel
epenthesis.
5.4. **Sources of Variation in Loanword Adaptation**

This section shows that there are indications of significant shifts in place. It is a case study that examines how nonce and newer loans are currently being produced by younger bilingual speakers. The data collected for this section relies on recordings taken from one bilingual speaker of approximately 20 years of age (see methodology for more info on him and elicitation sessions). Each elicited form is framed by a 3 tone, was recorded six to seven times and then averaged using Excel.

(143) Elicitation Sentences for Possessed and Unpossessed Forms

Elicitation for unpossessed form: ‘yoʔ3 me3 ____ a32’ /‘that is a ______’
Elicitation for possessed form: ‘yoʔ3 me3 ____ noʔ3 a32’ /‘that is her ______’

Based on these recordings, there appear to be two prosodic shifts that can be found in loanword adaptation (see below). The first can be considered a purely internally motivated shift caused by simplification. The second may be an indication of externally motivated shift caused by increased access to Spanish phonotactic rules although more data will need to be collected in order to determine definitive patterns for these new forms of adaptation. The two sources of variation are listed in 144 below.

(144) Tonal shifts in progress in Copala Triqui

a. Complex words become simple words (V3V4 → V. V4, V.3VV4 → V.VV4)

b. Increased access to Spanish phonotactic rules is changing the shape of loans (V32.Vh)

There are two shifts that can be taken from Hollenbach’s (2005a) dictionary and syntactic sketch. Examples 145a,b show two complex native words that have simplified over time. Both started out as compound words that fused and maintained lexically linked tone on the
penultimate syllable (the original first word), which in turn simplified over time to create a simple word with one lexically linked tone. Section 5.4 will look at the simplification of established loans in the speech of this speaker.

5.4.1. Complex Words Become Simple Words in Some Cases
Simplification of complex words in Copala Triqui is a relatively common process and there are examples to draw from in the literature. In each, the change involves a complex word whose lexically linked tone coincides with what the epenthetically derived tone would be. Example 145 below includes two examples of words that have been simplified over time.

(145) Native words that have lost the linked tone (Hollenbach 1984: 256)

a. /ra³tsũu⁵/ → /ratsũu⁵/ ‘bread’ (tša³ ‘tortilla’ + tšũu⁵ ‘box’ ‘oven’)
b. /ra³gaʔ³/ → /ragaʔ³/ ‘key’ (raʔa³ ‘hand of’ + agaʔ³ ‘metal’)

In essence, it would be difficult to prove that this change has taken place if there were not an F2 (morphophonetic) rule to make these changes more transparent. Indeed, the possessive form of these items demonstrates that they have indeed shifted from complex to simple words as the final syllable is the one that takes F2 changes and not the nonfinal.

(146) Possessive form of words that have gone from complex to simple

a. se⁴²ratsũu¹ (*not se⁴²ra²tšũu³)
b. se⁴²ragaʔ¹³ (*not se⁴²ra²gaʔ³)

This also happens in the formation of some denominal adjectives such as cha²na¹ (female), which is derived from cha³na¹ (woman). Although at first the V2V1 format keeps both lexically linked tones, the adjectival form eventually loses its connection to the F2 parsing rules (Hollenbach 1984: 258). Basically, similar to what we saw above, the 2 tone of the nonfinal syllable would be the same whether it was derived through F2
rules /cha^2_.na^1/ or tone epenthesis rules as in /cha_.na^1/. Either would lead to a phonetic representation of [cha^2_.na^1]. This is unsurprising since there is very little reason to keep the lexically linked tone of the non-final syllable if it does not have a high functional load. In essence, the loans that have nonfinal syllables with 3 tone that are followed by a 4 tone have no reason to maintain the status of complex word.

Given the tendency for simplification as outlined above, it would follow that loans with a V3VV4 and V3V4 format would simplify to V.VV4 and V.V4, respectively. Indeed, the variation in loans taken from input forms with penultimate stress in Hollenbach’s data supports this claim. Loans of a V3VV1 and V3V1 format would be expected to resist this simplification. What follows is a brief description of each type of loan. This data clearly shows that this simplification is in place, at least in the speech of this particular speaker.

Hollenbach claims that lexically linked nonfinal tone is evidenced by a V2V4 possessive form. The possessive form in elicitations, however, does not show a V2V4 format. Instead, the final syllable lowers to a 1 tone, which is to be expected for a word-final 4 tone in a simple word rather than a complex word. In addition, when the possessive marker is reduced, its tone is disassociated and moves rightward attaching itself to the leftmost side of the final syllable in each example. This creates a 31 contour tone in each case. Each measurement of tone represents the start and end point of each vowel with tone in the word. See chapter 3 for the baseline measurement of tone for this speaker, which is based on Hollenbach’s (1984) method of measuring tone.
Table 5.4. Possessed and unpossessed forms of ultimates in context\textsuperscript{93}

<table>
<thead>
<tr>
<th></th>
<th>Declarative</th>
<th>Possessive</th>
<th></th>
<th>Declarative</th>
<th>Possessive</th>
<th></th>
<th>Declarative</th>
<th>Possessive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>trĩ\textsuperscript{34}</td>
<td>s-trĩ\textsuperscript{31}</td>
<td></td>
<td>a\textsuperscript{32}roo\textsuperscript{4}</td>
<td>s-a\textsuperscript{3}roo\textsuperscript{31}</td>
<td></td>
<td>a\textsuperscript{32}vi\textsuperscript{2}õõ\textsuperscript{34}</td>
<td>s-a\textsuperscript{3}vi\textsuperscript{2}õõ\textsuperscript{31}</td>
</tr>
<tr>
<td>me</td>
<td>122</td>
<td>128</td>
<td>me</td>
<td>129</td>
<td>125</td>
<td>me</td>
<td>126</td>
<td>127</td>
</tr>
<tr>
<td>trĩi</td>
<td>127-132</td>
<td>126-102</td>
<td>a</td>
<td>128-118</td>
<td>119-113</td>
<td>a</td>
<td>124-116</td>
<td>119-110</td>
</tr>
<tr>
<td>roo</td>
<td>126-134</td>
<td>123-104</td>
<td>ßi</td>
<td>118-122</td>
<td>127</td>
<td>ßi</td>
<td>122-132</td>
<td>126-109</td>
</tr>
</tbody>
</table>

In the trisyllabic example, the possessed form is realized with 2 by creating a palatalized bilabial onset as in \([a][v^{31}õõ]\).\textsuperscript{94} Note that the 4 tone of the final syllable exhibits a 34 upglide, which supports Hollenbach’s claim for 4 tones that are attached to long vowels.

As mentioned earlier, words taken from Spanish inputs with penultimate stress

\textsuperscript{93} I am not sure why I am getting a clear 31 drop in the possessives. Perhaps the sharp drop in tone of the second type is an additional indicator of possessive.

\textsuperscript{94} Although this word seems to be treated as a bisyllabic word with two feet in the possessive, in the declarative it clearly has three syllables. This word is not an established loan in Triqui and traditionally people have used /kutşi[^3]ṭe[^2]ʃta[^1]/ or ‘car that walks in the sky’ to represent planes and helicopters. The strict adherence to Triqui structure in the possessive while the declarative shows more variation is seen in other examples from this speaker.
show some inconsistency in how they are transcribed in Hollenbach (2005a). For example, the loan for table (Sp 'mesa') is written as me\textsuperscript{3}sa\textsuperscript{4} and also mesa\textsuperscript{4}, the former assuming a nonfinal lexically linked tone and the latter a simple word with only one lexically linked tone on the final syllable. This hints at a possible simplification of complex loans over time, similar to that of the compound words. As was the case with the loans taken from input forms with ultimate stress, this category of loan no longer shows signs of having lexically linked tone or secondary stress in the possessed forms as can be seen in Table 5.5 below.

Table 5.5. Possessed and unpossessed forms of penultimates in context

<table>
<thead>
<tr>
<th>la.pe – pencil (Sp 'lápiz')</th>
<th>Mesa – table (Sp 'mesa')</th>
<th>Ya.ve – key (Sp 'llave')</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decl La\textsuperscript{32}pe\textsuperscript{43}</td>
<td>Poss sla\textsuperscript{3}pe\textsuperscript{1}</td>
<td>Decl Me\textsuperscript{32}sa\textsuperscript{43}</td>
</tr>
<tr>
<td>me 131</td>
<td>132</td>
<td>me 129</td>
</tr>
<tr>
<td>la 127-121</td>
<td>130-126</td>
<td>me 129-123</td>
</tr>
<tr>
<td>pe 141-130</td>
<td>115-110</td>
<td>sa 143-126</td>
</tr>
<tr>
<td>Decl Ya\textsuperscript{32}βe\textsuperscript{43}</td>
<td>Poss Sya\textsuperscript{3}be\textsuperscript{1}</td>
<td></td>
</tr>
<tr>
<td>me 122</td>
<td>122</td>
<td>ya 124-118</td>
</tr>
<tr>
<td>pe 131-126</td>
<td>109-101</td>
<td></td>
</tr>
</tbody>
</table>

As with the loans taken from input forms with ultimate stress, I am working under the assumption that the loans taken from input forms with penultimate stress were brought in as complex originally and have simplified over time. There are two interesting facts to point out. First, as opposed to loans taken from ultimates, the 4 tone in this category is
attached to a short vowel and surfaces as a 43 downglide. Second, the delinked tone of the possessive marker shifts rightward although it is interesting that, in this case, it attaches itself to the penultimate syllable rather than the final syllable.

The third category, loans taken from input forms with antepenultimate stress, behave differently than the two forms above. Elicitation data support the claim that this category of loan is underlyingly V3.V1. In the unpossessed form, the tone of the antepenult is extremely level, which is a strong indicator of a 3 tone. Also, in two of the three cases the tone matches that of the copulative me3 frame word.95 The possessive form is a little more difficult to pin down. In each case, the tone seems to drop from a 3 tone in the word-initial syllable to a definite 1 tone in the final syllable. It can be assumed that the possessive form goes from V3.VV1 to V2.VV1, as would be expected for a complex form of this sort. The possessive marker, once delinked, moves rightward and attaches itself to the first lexically linked tone, in this case it is the 2 tone of the nonfinal syllable in the possessive form.

95 The rise in pitch of the first syllable can be seen in both the declarative and possessive of this word is most likely a phonetic raising of the pitch due to the presence of a voiceless obstruent in the onset of a syllable with lexically linked tone.
Table 5.6. Possessed and unpossessed forms of antepenultimates in context.

<table>
<thead>
<tr>
<th>Ca'mara₁ – camera (Sp 'camera')</th>
<th>Ma'kina₁ – machine (Sp 'máquina')</th>
<th>Fa'brika₁ – factory (Sp 'fábrica')</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decl ka₁ me²'ra¹</td>
<td>Poss s-ka² me²'ra¹</td>
<td>Decl ma¹ ki²'na¹</td>
</tr>
<tr>
<td>me 123Hz 121</td>
<td>me 133 119</td>
<td>ma 132 118-109</td>
</tr>
<tr>
<td>ca 131 125-118</td>
<td>ma 132 118-109</td>
<td>Fa 124 127-123</td>
</tr>
<tr>
<td>me 129-121 110-102</td>
<td>ki 126-121 108</td>
<td></td>
</tr>
<tr>
<td>ra 124-113 98</td>
<td>na 113-106 99</td>
<td>ka 116-111 105</td>
</tr>
</tbody>
</table>

This supports my claim that loans of this format are not prone to simplifying since the nonfinal lexical tone does not coincide with what would be expected if that same tone had been derived through epenthesis. It is curious, however, that the 1 tone of the possessed form is consistently lower than that of the unpossessed form. Perhaps the lowering in tone is an additional marker of the possessed form. None of the formative rules apply to low tones.

The final type of loan to look at is the category of loans taken from input forms with ultimate stress and a word-final sibilant. It is difficult to predict what might happen to loans in this category. On one hand, they could behave similarly to loans taken from inputs with antepenultimate stress since their underlying forms are the same.

Alternatively, the fact that the V3V1 format is created in part by vowel epenthesis may play a significant role. Elicited data shows that the possessive form of these loans shows
very little change from the declarative form which supports the idea that, in the case of
established loans, this type of loan behaves similarly to the loans taken from Spanish
inputs with antepenultimate stress. As with the loans taken from input forms with
antepenultimate stress, the 3 tone of the nonfinal syllable is either neutralized or changed
to a 2 tone in the possessive and the rightward movement of the delinked tone of the
possessive marker se\textsuperscript{32} is masking the tone change from 3 to 2 tone in the lexically linked
nonfinal tone of the possessive.

Table 5.7. Possessed and unpossessed forms of ultimates with sibilant codas in context

<table>
<thead>
<tr>
<th></th>
<th>Decl dyo\textsuperscript{3}se\textsuperscript{1}</th>
<th>Poss s-dyo\textsuperscript{3}se\textsuperscript{1}</th>
<th>Decl re\textsuperscript{3}se\textsuperscript{1}</th>
<th>Poss s-re\textsuperscript{3}se\textsuperscript{1}</th>
</tr>
</thead>
<tbody>
<tr>
<td>me</td>
<td>142.8Hz 139.4Hz</td>
<td>me 123.9Hz 123Hz</td>
<td>me 126.6Hz 123Hz</td>
<td>me 122Hz 120Hz</td>
</tr>
<tr>
<td>dyo</td>
<td>146.7-128Hz 142-125Hz</td>
<td>re 126.6Hz 123Hz</td>
<td>hwess 131Hz 132-99.5Hz</td>
<td></td>
</tr>
<tr>
<td>se</td>
<td>127.4-115Hz 124.7-115Hz</td>
<td>se 114-102Hz 108-103.1Hz</td>
<td>X NA</td>
<td></td>
</tr>
</tbody>
</table>

What is interesting about loans of this category is that, at least in the case of newer/nonsense
loans like ‘judge’, epenthesis seems to be phasing out. In addition, bilinguals may no
longer use epenthesis as an adaptation strategy. Even more interesting is the fact that the
tone of the final syllable looks more like a 4 tone than a 3 tone. This could further support
my proposal that all stressed syllables get a 4 tone in Triqui and would also bring it in line
with the adaptation patterns of other loans taken from Spanish input forms with ultimate stress (without a word-final sibilant coda).\(^\text{96}\)

The table below represents the tones that I think are being used in the literature and elicitation data taken from one bilingual speaker. Complex loans have simplified in the case of input forms with ultimate and penultimate stress and have remained complex in the case of loans taken from input forms with antepenultimate stress and loans taken from ultimate stress that also have a word-final sibilant coda. The source of this simplification/variation is internal.

Table 5.8. Summary of possessed and unpossessed forms in literature and elicitations

<table>
<thead>
<tr>
<th></th>
<th>Hollenbach 1973, 2005a</th>
<th>Elicitations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ultimate</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>train</td>
<td>/trî tô/</td>
<td>/s-trî tô/</td>
</tr>
<tr>
<td>rice</td>
<td>/a’ro: tô/</td>
<td>/s-a’ro: tô/</td>
</tr>
<tr>
<td><strong>Penultimate</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pencil</td>
<td>/la’pe: tô/</td>
<td>/s-la’pe: tô/</td>
</tr>
<tr>
<td>table</td>
<td>/me’sa: tô/</td>
<td>/s-me’sa: tô/</td>
</tr>
<tr>
<td>key</td>
<td>/ya’be: tô/</td>
<td>/s-ya’be: tô/</td>
</tr>
<tr>
<td><strong>Antepenultimate</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>machine</td>
<td>/ma’kî:na/</td>
<td>/s-ma’kî:na/</td>
</tr>
<tr>
<td>factory</td>
<td>/fa’bri:ka/</td>
<td>/s-fa’bri:ka/</td>
</tr>
<tr>
<td>camera</td>
<td>/ka’mे:ra/</td>
<td>/s-ka’mे:ra/</td>
</tr>
<tr>
<td><strong>Ultimate with sibilant coda</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>God</td>
<td>/dyo’sê tô/</td>
<td>/s-dyo’sê tô/</td>
</tr>
<tr>
<td>cross</td>
<td>/re’sê tô/</td>
<td>/s-re’sê tô/</td>
</tr>
<tr>
<td>judge</td>
<td>/go’sê tô/</td>
<td>/s-hwe’sê tô/</td>
</tr>
</tbody>
</table>

\(^{96}\) It is interesting that this sibilant is maintained in coda position in the declarative but not in the possessive. Similar patterns of maintenance in the declarative and deletion in the possessive were found in other loans with word-final sibilant coda loans such as [do.to\(^{4}\)], or *doctor*, which switched to [se\(^{32}\) do.to:\(^{1}\)] in the possessive.
In sum, when a lexically linked tone of a nonfinal syllable is identical to the tone that would be derived if the same word were simple, there is little reason to maintain the word as complex. This simplification, however, only applies to more established loans. The next section looks at examples of nonce-borrowings recorded as part of elicitation sessions. Instead of giving a definitive answer, these examples raise questions about how tone is currently applied to loans. At this point, the data supports the analysis in the previous section that a 4 tone is applied to all stressed syllables but that nonfinal tone reduction is no longer present in loans taken from inputs with ultimate stress and penultimate stress (not enough to conclude for antepenultimates). The examples also indicated that epenthesis is no longer a productive strategy. Finally, the examples indicate that the application of an aspirated laryngeal coda (as outlined by Hollenbach 2005b) may not be an inherent part of the word itself. Instead, it may be a marker to indicate that a word is foreign or that the stress pattern has shifted to a non-final syllable. The maintenance of Spanish stress would be in line with the emerging idea that maintenance of foreign prosodic patterns correlates with more intense contact (Kang 2010).

5.4.2. New Forms of Adaptation due to Increased Access to Spanish Prosodic Rules
There has been a new pattern of tonal adaptation of stress in Triqui that has come about more recently. Hollenbach (2005b) has described this new pattern as a possible 32 tone with an aspirated laryngeal. The two examples below, however, are the only examples that she gives and they only represent loans taken from inputs with penultimate stress.

(147) Examples of newer form in Hollenbach (2005b)
During my elicitation sessions with a less conservative speaker, it became apparent that newer loans and/or nonce-borrowings are starting to take on new forms of adaptation, some of which seem to be radically different from the forms outlined above.

Since Hollenbach (2005b) gives examples of loans taken from inputs with penultimate stress, this section will focus there. In the sessions, I elicited two examples of penultimates that strayed from the conservative (even if simplified) format. The first, ‘pizza’ was elicited intentionally and the second, ‘iPhone’ was elicited from random objects in the room. Interestingly, both have two 4 tones rather than the 32 tone as indicated by Hollenbach. Both also maintain Spanish stress. What is most distinctive about these two loans is the realization of the 4 tone and the presence/absence of aspirated coda. These two loans lead me to believe that the length of the syllable influences how the 4 tone is realized, short vowels get a downglide and long syllables (like the diphthong of iPhone) get an upglide. The fact that one has an aspirated coda and cannot be determined at this point and there are no features of the words themselves that would encourage or discourage this feature. Laryngeals and nasal vowels can co-occur; in fact, I find the aspirated coda after many coda consonants.

(148) Loans taken from penultimates (unpossessed \(\rightarrow\) possessed)

a. pizza \(\text{pi}^{43}\text{tzah}^{43} \rightarrow \text{spi}^{43}\text{tzah}^{1}\) (probably underlyingly \([\text{se}^{32}\text{pi.tzah}^{1}]\))

b. iPhone \(\text{ai}^{34}\text{fõŋ}^{43} \rightarrow \text{ai}^{32}\text{fõŋ}^{1}\) (probably underlyingly \([\text{se}^{32}\text{ai.fõŋ}^{1}]\))

Loans taken from inputs with antpenultimate stress also show some variation. First,
'telephone' does not give the expected V3VV1 pattern although the deletion of the penultimate syllable may indicate that it is actually perceived as having penultimate stress. The fact that the stressed syllable in Spanish is not the first syllable may also be a factor since all other loans of this sort recorded in Hollenbach’s (1973, 2005a,b) data come from Spanish inputs where the antepenultimate stress is also on the first syllable of the word. As in the other examples, there is inconsistent use of aspirated coda. Also of note is the fact that 149c takes the traditional V3VV1 format but also has an aspirated coda. What is especially interesting about this example is that the aspirated coda is found in the unpossessed form of the word but not in the possessed form.

(149) Loans taken from antepenultimates (unpossessed \( \rightarrow \) possessed)

a. teléfono \( \rightarrow \) telefno\(^{43} \rightarrow s\)-tele\(^3\)fno\(^1\)

b. fábrica \( \rightarrow \) fa\(^3\)brika\(^1\) \( \rightarrow s\)-fa\(^4\)brika\(^1\) or s-fa\(^3\)brika\(^1\)

c. lámpara \( \rightarrow \) la\(^3\)mparah\(^1\) \( \rightarrow s\)-la\(^3\)mpara\(^1\)

Finally, there is one example taken from an input word with ultimate stress (or monosyllabic words) and word-final sibilant coda that shows some interesting patterns. It should be noted that this loan meaning ‘judge’ (Sp ’juez’) also has a traditional form of /go\(^3\)se\(^1/\) that can be found in the literature as well as in elicitation sessions done by the author with more conservative speakers in California and Mexico. In this example, there is no aspiration in word-final coda position. What is interesting about these forms is that they both show some variation in epenthesis. Example 150 is the adaptation of ‘judge’ by the speaker with less conservative adaptation patterns. This loan is traditionally adapted to a V3V1 format but this speaker adapts it with a 4 tone in the unpossessed and 1 tone in the
possessed form. In addition, he maintains, and even strengthens the word-final sibilant in the possessed form. He is unable to do this in the possessed form. It would seem that it is easier to break native rules in the unpossessed (less marked) and more difficult to maintain this break from native phonotactic rules when new phonotactic rules are placed on it. The second important shift is the apparent adaptation of these loans with a 4 tone rather than a 3 tone, as seen in conservative/established loan forms. This is further support for the idea that all stressed syllables in Spanish are given a 4 tone in the Triqui input.

(150) Epenthesized loans (unpossessed \(\rightarrow\) possessed)

a. judge (Sp 'juez') hews: \(\upsilon\) s-hwe: \(\upsilon\)

While more examples need to be collected to draw conclusions, it would seem that these examples indicate three things. First, there is no more restriction on lexical tone in nonfinal syllables which are typically restricted to 2, 3, or 5 tones. Second, Triqui bilinguals who are adapting these nonce and newer loans are more sensitive to Spanish prosodic rules and as such they maintain Spanish stress. This can especially be seen in loans taken from inputs with penultimate stress that maintain the 4 tone in the two final syllables. Finally, the laryngeal coda is not consistently applied as indicated in Hollenbach (2005b).

Finally, this laryngeal feature shows three tendencies that shed some light on its role. First, the aspirated coda was found to be applied inconsistently to both established and nonce loans in the speech of Triqui children in diaspora. In fact, the same speaker would use the aspirated coda in one iteration of the word and leave it off in the very same
session (Scipione 2008). Second, the same speakers often added the aspirated coda to a
word with a word-final consonant coda. For example, the loan for snail (Sp 'caracol') was
often elicited as /karakolh/. Finally, the speaker used for elicitation sessions in the present
chapter would often apply the aspirated coda to the final word in a sentence as seen in 151
below. The fact that the name Maria is also a loan may be an explanation for this
tendency, however, the presence of a shift in stress to the penultimate syllable should be
noted.

(151) Example of elicitation sentence with final aspiration

\[ \text{yo}^{3} \text{ me}^{3} \text{ s-la}^{3} \text{ pe}^{1} \text{ ma.ri}^{4} \text{ ah}^{32} \text{ a}^{32} \]

that cop poss-pencil maria decl

‘That is Maria’s pencil’

At this point there are two possible explanations for the addition of aspiration. It could be
a sociolinguistic marker to indicate the foreignness of the word or it could be more
functional in nature, resulting from the shift in stress to a nonfinal syllable. The data from
this study can only point to possible explanations. Elicitations taken from a larger cross
section of speakers will be necessary to further understand this feature.

5.5. Conclusion

This chapter has established some patterns of adaptation at the prosodic level but more
importantly, it has created some concrete areas for further study. The second section,
which outlined possible conservative adaptation processes, shows how the stress pattern
of Spanish may influence the tone of the Triqui output but it is still not clear if Triqui
speakers cue in on Spanish pitch, stress, or some other feature.

There is a growing body of literature dealing with how languages apply
suprasegmental features such as tone and stress to imported lexical items from languages
that use phonetic correlates such as pitch, intensity, and vowel length to indicate stress.
Some languages seem to take the stressed syllable of a pitch language and translate that
into a high or medium tone. These languages include Yoruba, Hausa, and Mandarin
(Kenstowicz & Suchato 2006). Often this is accompanied by native phonological
mechanisms as is the case in Mandarin and Dhulua, where tone is subsequently
influenced by the voicing of onset syllable (Mandarin) or by whether the syllable is open
or closed (Dhulua). A third group of languages basically ignores the stress of the input
language, altogether applying tone according to native rules. It is not clear at this point
whether the first two categories are cueing in on the rise and fall in pitch of stressed
syllables in the source language or on another aspect of stress such as intensity or
syllable length (Kenstowicz & Suchato 2006). Finally, other languages ignore the
stress/pitch prominence of the donor language and apply tone according to native rules.
Vietnamese loans from French, for example, apply high tone to open syllables and
syllables ending in a sonorant and low tone to syllables ending in a stop (Kang 2010).
White Hmong, also adapting loans from French, applies low tones across the board.\(^7\) It
seems though, that Triqui falls into the middle category of loans assigning a default high
tone to the stressed syllables with subsequent language specific features that influence
the eventual production of tone. More will need to be done to know for sure what

\(^7\) It has been noted that the languages that tend to ignore donor language prosodic input
are East Asian languages (Kang 2010).
aspects of Spanish prosody Triqui speakers cue in on in order to assign tone to these loans historically and in the case of more innovative adaptations.

Section 5.3 has raised more questions than it has answered and will be an interesting area to pursue. In order to do this, however, it will be necessary to collect large quantities of data using sociolinguistic methods as well as elicited data. The inconsistent nature of the production of these newer forms would challenge a traditional elicitation format. The format of data collection should also be given careful consideration since some speakers will tend to give a more formal/conservative version of it in an elicitation setting in order to conform to what they perceive should be the correct form, which is also valuable data but not for the purposes of looking into this aspect of Triqui. In addition, it may be that not every speaker will equal access to these innovative forms. Monolinguals and semispeakers of Spanish, for example, may not produce this form at all.98

Discussion

The preceding chapters focused on the phonetic adaptation of Spanish loanwords in Triqui in order to identify possible areas of contact-induced linguistic change at the segmental and prosodic levels. In order to establish contact-induced change there are a series of steps to be followed. First, it is necessary to document that variation exists. This variation, in turn, must be shown to be change and not a natural occurrence in the

98 Informal observations during elicitation sessions in California lead me to believe that certain words, such as pizza, are pronounced with a word final aspirated coda and penultimate stress even by monolinguals and highly Triqui dominant bilinguals.
language. Finally, once change is established, it must then be shown to be a direct result of external contact rather than a natural internal shift.

The data from both XEQIN Radio and Hollenbach (1973) demonstrate variation at the segmental level. Much of this variation, such as voicing and devoicing in nonfinal syllables, occurs naturally in Triqui. Of particular note, however, is apparent increased faithfulness to voicing of the input in historically neutral positions, increased use of Spanish bilabial obstruents, and increased use of the Spanish rhotic trill. Of the three areas, the best candidate for contact-induced change is the increased use of Spanish bilabial obstruents. Increased faithfulness to voicing has also been identified by Hollenbach (1973) as a possible shift; however, the data from this study is not suitable for drawing conclusions in this area. Finally, the increased use of the Spanish rhotic trill would seem to be the most clear-cut example of contact-induced change. Patterns of usage in XEQIN Radio data show that this change is actually internally motivated caused by the increased tendency to delete nonfinal vowels. The truncation of nonfinal syllables put rhotics in contact with consonants, which in turn prompts a more fortis-like pronunciation. It is interesting that the incorporation of a rhotic trill brings rhotics in line with the rest of the Triqui sibilant system by creating two variants with one point of articulation.

Future studies should focus on the behavior of Spanish bilabial obstruents ‘b’ and ‘p’ in native words and loanwords. Some data in this study indicate that these sounds, while not be participating fully in Triqui phonetic rules, may be showing signs of productive integration into Triqui’s obstruent inventory. Although, there is evidence that sociolinguistic awareness blocks this sound from fully participating in native phonotactic rules of voicing and devoicing in the speech of more conservative speakers some
tendencies found in the speech of younger bilinguals show signs that the Triqui bilabial system may be currently undergoing a shift that brings it in line with the Spanish system. This shift, as mentioned above, also brings Triqui bilabials in line with native tendencies for alveolar and velar obstruents.

On the prosodic level it was necessary to collect data in a more controlled fashion in order to take advantage of morphological processes that affect tone. High-quality recordings were taken of target forms in both possessed and unpossessed forms. This data shows a few possible changes in progress. First, loans have historically been considered to be complex words with lexically linked tone on both the final and a nonfinal syllable. The possessive forms of these loans as produced by a young bilingual speaker, indicate that these loans have simplified over time. Second, there is an increased tendency to maintain Spanish stress, especially in less established loans and most notably in loans taken from inputs with penultimate stress. Third, this shift in stress may, in turn, be encouraging an innovative use of word-final aspirated laryngeal although it is unclear at this point the extent to which the maintenance of Spanish stress and production of word-final aspirated laryngeal are related. Finally, mandatory vowel epenthesis in loans ending in syllables with primary stress and sibilant codas is no longer productive in the speech of bilinguals. Some recordings in California suggest that this may also be found in the speech of monolinguals.

Of the changes outlined, the newer possessive form, caused by the simplification of loans over time, is not externally motivated. Examples of similar simplification can be found in native words in the literature. Conversely, maintenance of Spanish stress and maintenance of word-final sibilants can be directly linked to increased access to Spanish
phonetic rules. Perhaps in modern Copala Triqui word-final stress is not as important as it was historically. The fact that these innovative prosodic adaptations disappear when native phonotactic rules are applied should be noted and may be an additional sign of a shift in progress. It is highly unlikely that shifts in stress in loanwords will have much effect on the native lexicon. The use of an aspirated laryngeal, if it can be linked to the maintenance of Spanish stress, would also be an example of indirectly motivated externally motivated linguistic change. Future work on contact-induced change at the prosodic level should focus on the relationship between stress shift and production of the aspirated laryngeal to ascertain whether these changes are indeed related or whether the production of the aspirated laryngeal is a sociolinguistic marker.

This dissertation does have a few limitations that should be addressed. First, although a basic description of the segmental inventory of Copala Triqui has been done, there is still much to be explored. Triqui, as part of the larger Oto-Manguean language family, has little detailed information on allophones and usage of specific phonemes. This inhibited a more detailed discovery of change. Instead, this study has focused more broadly on possible changes and has identified areas of future study. In addition, the data here focused on individual words from one speaker and one study rather than extended transcription of discourse from multiple speakers. It cannot make claims related to frequency of use or origins of change (generational, geographical, etc.).

While not a focus of the current study, there are also some syntactic changes that are of interest. Most pressing is the rapidly increasing use of Spanish verbs in Triqui. Interestingly, these verbs are consistently changed to conform to native patterns of stress and syllable structure in Triqui. Syntactically, there is evidence that these verbs are often
used without a Triqui verb to precede it. It will be interesting to study how tense and aspect are marked in these cases.
References


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Huerta Ríos, César. 1981. Organización socio-política de una minoría nacional: Los


Kenstowicz, Michael. 2006 Tone Loans: The adaptation of English loanwords into


Martinet, André. 1959. La palatalisation “spontanée” de g en arabe. Bulletin de la Société
de Linguistique de Paris 54.90-102.


Navarro Tomas, T. 1922. La cantidad silábica en unos versos de Rubén Darío. Revista de Filología Española, IX.1-29.


