

CHAPTER 7

## A sociolinguistic sketch of vowel shifts in Kaqchikel

ATR-RTR parameters and redundancy markedness of syllabic nuclei in an Eastern Mayan language<sup>1</sup>

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Kaqchikel, a Quichean language of the Guatemalan Highlands, is well known for its Tense/Lax Vowel Contrast (TLVC) and the wide range of dialect variation of its vowel system, but the acoustic properties of its vocoids have never been scrutinized. A preliminary survey of the speech of ten informants from four sub-dialect areas, with a focus on San Juan Comalapa, shows regular patterns of variation according to degree of tongue-root fronting or backing (ATR and RTR), along with unexpected clues of a lingering Proto-Mayan length correlation. Emerging vowel shifts are described and traced to the Colonial era and to more recent social upheavals. A striking regularity of dialect patterns is observed when Kaqchikel is viewed as a diasystem.

Vine a Comala[pa] porque me dijeron que acá vivía mi padre, un tal Pedro Páramo. – Juan Rulfo, *Pedro Páramo*

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1. Cecilio Tuyuc, chairman of the Kaqchikel Academy of Mayan Languages of Comalapa (ALMG) in Chimaltenango and formerly in charge of language planning at the ALMG, made fieldwork possible, and he recorded five of the fifteen interviews. Jean Léo Léonard carried out fieldwork, with the most valuable help of Victor Hugo Roquel (alias “Jackie Chan” and SJC-HU-52) in August 2006, made phonetic and phonological analyses of the data and wrote the chapter. Thanks to Gilles Polian, Ciesas, México for technical help on digitalization, and to Cedric Gendrot (MR 7018, Paris) for his engineering and designing of vowel charts. The data was recorded at the informants’ homes with a Sony Minidisc MZ-R37 and a tie pin Sony ECM-T140 microphone, digitized at 40,000 hz, 16 bits. Unfortunately, lack of time impeded us from analysing all the data recorded during fieldwork; many interviews with the adults in Xenimakin or from K’iche’ languages, recorded for comparison, could not be included in the sample on time. We hope to publish extensive results elsewhere in the future.

## 1. A trip to contemporary Iximche' suburbs: The Kaqchikel diasystemic network

### 1.1 Entering the Kaqchikel world

The vowel shifts taking place in four Kaqchikel varieties, which we shall ~~endeavour~~ to sketch in this paper, fit appropriately in a publication where Labovian sociolinguistics and quantitative linguistics are addressed. We view it more as a contribution for the benefit of linguistic research than an agora for a discussion on such terms as *covariation*, *social stratification*, *urban dialectology*, or *languages in contact*. Most of these questions will constantly haunt the following pages, but they will keep to the role of ghosts popping in on a friendly visit. We shall rather cling to diasystemic description and to quantitative empirical phonology based on experimental phonetics, and leave external factors for more expert scholars. What we mostly have to offer here are diasystemic syllabic categories (*nuclei*, i.e. *vowels*, their segmental and prosodic properties) and methodological glimpses of a topic which, up to now, has never been approached with experimental and quantitative methods: the Tense/Lax Vowel Contrast (TLVC) in a Quichean language: Kaqchikel (Eastern Mayan of the Mesoamerican highlands).

In fact, the Kaqchikel language qualifies as a good field for a covariation survey, too, since the Amerindians who speak it live mostly in urban centers of various sizes, surrounded by stunningly beautiful natural sites: a huge volcanic lake, Atitlán, in the Sololá and Panajachel region; the central valley of the southwestern Guatemalan highlands, south of the pre-Columbian archaeological site Iximche' – presumably inhabited or ruled by Kaqchikels; a pericentric position to Kaminaljuyu<sup>2</sup> – nowadays Ciudad de Guatemala, the economic and administrative center of Guatemala, and the later colonial town of Santiago de los Caballeros, i.e. Antigua. Any tourist coming from Europe or Northern America to study Spanish on holiday in the gorgeously pretty colonial town of Antigua actually enters the Kaqchikel world, a southwestern expansion of their contemporary neighbors, the K'iche's (over 1 million speakers nowadays).

We should bear in mind that Mesoamerican indigenous societies go far beyond the traditional clichés of blatant “ethnic” clothes, smiling women with dazzlingly colorful *huipiles* selling handicrafts to tourists, and hard working farmers busy in their *milpa*, the Mesoamerican maize crop, growing beans and chile in the shadow of corn stalks. In fact, Meso-Amerindian societies are swiftly adaptive

2. In contrast, Pre-Classic Kaminaljuyu – and part of the now Kaqchikel eastern fringe (Satepéquez) – was probably inhabited by Poqoms, with an Olmecan (i.e., mixe-xoque, in that case) or a mixed Olmeco-Cholan elite.

ones, involved in continuous evolution; over centuries, they have perfected the art of adapting to complex economic, ethnic, and political contexts. The Mayan people are mobile; they travel and migrate quite a lot in their own country and abroad to the north, exchanging craftsmanship and expertise easily, being converted into new forms of religion or faith, entering into complex networks of local government, and getting training in non-governmental organizations or at the university. They make up a part of modern Mesoamerica which depends strongly on dynamic Amerindian societies.

Mesoamerica is a funnel-shaped subtropical isthmus ridged with mountains, volcanoes, and rivers that links North and South America; it is here that one of the main cultural cores of the whole American continent emerged around 1500–900 B.C. (the Ajalpán subphase), with roots in the Coaxatlán phase (5200–3400 B.C.).<sup>3</sup> Ever since, these societies have been exploring and developing technologies and intricate political and social networks. They have coped with colonial power and dispossession of their land and sovereignty, and although they do still resist, culturally, the Conquista and postcolonial framework of their homeland, they adhere to modern Mesoamerican countries and to national citizenship. They sometimes even have a broader view than their mestizo fellow-countrymen, and they act as a consistent and progressive pressure group in international affairs in spite of overwhelming pressure for segregation according to the post-Conquista pattern of government.

Dehouve (2003) shows that even the agrarian question (i.e., the struggle for land ownership and the end of the dispossession of indigenous farmers) is no longer the major struggle for Mexican Amerindians; financing the engineering of a wide array of socioeconomic projects takes precedence on land claims. The same could be said of rural and urban Mayan communities all over Guatemala. Clichés about agrarian, traditionalist, and monolingual ~~marginalised~~ communities living in refuge zones contrast with modern Mayan postindustrial, modern, bilingual or multilingual, integrative societies.

To a certain extent, we may even say that native Mesoamerican societies are more integrative themselves – according to a pluralistic integration model – than the dominant postcolonial societies which up to now have pretended to integrate them through assimilation. As early as 1974, a Catholic priest<sup>4</sup> published *Quiché Rebelde*, a meticulous survey of religious conversions in San Antonio Ilotenango (district of Quiché) between 1948–1970. He gives a vivid picture of a multiplex

3. Cf. Eiroa 2000: 292–294.

4. Ricardo Falla, who later became well known for his book *Masacres de la Selva* (1992), which denounced the slaughter organized by the Guatemalan army in Ixcán during the *Violencia* period.

and adaptive society experiencing continuous renewal of its ideological and political assets (Falla 1974).

Modern Mayan societies in Mexico and Guatemala are by no means traditionalist ghettos or reservations; a strong cultural and socio-economic continuity prevails in Guatemala between Amerindian and Mestizo settlements concerning architecture and standards of living, although most people live in poverty or have a low standard of living because of inequalities in the postcolonial economy. The differences lie mostly in language, some aspects of social organization, and women's garments (most men have given up their traditional garments, except in remote places like Todos Santos, in the Huehuetenango district). Nevertheless, hostility between *ladinos*,<sup>5</sup> mestizos, and Mayan people is by no means widespread (except in elite circles, as shown by Marta Elena Casaús Arzú (Arzú 1998)). Ethnic polarization is actually weaker than could be expected, in spite of historical hardship. Guatemala appears more as a “healing” society than a polarised one.

## 1.2 Kaqchikel diasystemic network

The so-called Eastern Mayan Languages (EML) sub-family appears as a compact segment of the Mayan phylum in Mesoamerica, with Mamean, Quichean, and Poqom languages as a cluster of three branching nodes. Mam-Awakatek, Ixil, and K'iche' (Minor Quichean) differ as much as Baltic from Slavic in the Indo-European linguistic phylum. K'iche', Poqom, and Qeqchi' differ as much as Romance languages, whereas K'iche', Kaqchikel, Tz'utujil, Sipakapek, Sakapultek, Uspantek, and Achi' are structurally as close to each other as Gallego and Spanish in modern Spain. The bulk of these languages make up approximately 60–65% of the population of Guatemala, a country with 12.5 million inhabitants and 20 Mayan languages.

For lack of space, we will not provide archeological or historical details in this empirical report on sociolinguistics in four types of Kaqchikel dialects. We shall only point out a few basic hypotheses on the impact of external factors on our object of enquiry: the Dialect Network (DN) on the one hand, and the diasystem (DiaSystem: DS) on the other hand. The macro-Mayan DN has been evolving for at least 3000–5000 years, whereas the Minor Quichean DN (K'iche'/Achi, Kaqchikel, Tz'utujil, Sipakapek, Sakapultek, Uspantek), after separation and further colonization southwards from the compact former macro-Quichean complex

5. Ladino, a term coined initially on “one who knows how to speak Spanish” in the colonies, means mestizo, half blood, but also has negative connotations, such as “robber”. We'll use it here as mestizo.

on the northwest (the Pacific coast and Cuchumatanes), has experienced expansive waves of colonization (of the Lake Atitlán and former periphery of the Xinca region) and cycles of cell-splitting processes of its DS. As the Minor Quichean DN has been expanding, shrinking or keeping stable cyclically for a few hundred years, the main phonological and grammatical patterns have remained constant.

In the 1970's, Lyle Campbell made a major contribution to Mayan historical linguistics with his essay on *Quichean Linguistic Prehistory*, in which he analysed the Kaqchikel DN according to lexical dissimilation factors in variables like DELAB.-m#, Pal-CL-#k, k', and UNVOIC-w#.

- (1) Kaqchikel DN features, according to Campbell (1977):
  - a. Final /m/ delabialization (DELAB.-m#): *poom* > *pon*, *pong*.
  - b. Palatal coda licensing by uvular stops or velar stop onsets before a low vowel (Pal-CL.#k, k'): *kaq* > *kyaq* = ‘red’. The palatal reflex of initial /k/ (#k-) is conditioned by a dissimilation from the uvular coda -q#.
  - c. Devoicing of final labiovelar approximant /w/ (UNVOIC-w#): *tew* > *teW*, *tef*.

San Juan Comalapa (35,450 inhabitants in 2002<sup>6</sup>), where the Kaqchikel variety which we shall investigate is now spoken, was still a meadow or a patchwork of *milpas* in pre-Columbian times. It was built up recently during the era of colonial *Reducciones*.<sup>7</sup> The dialect variety we shall study in more detail in this paper is therefore the result of a new settlement which took place in colonial times. As far as TLVC (Tense/Lax Vowel Contrast) is concerned, people arrived from ATR, RTR,<sup>8</sup> and Neutral dialect areas, and the ATR parameter won the gambling and scrambling of phonological features: the best bargain which could be made between the very marked RTR pattern (as PatzHU48 and Tecp-HU30<sup>9</sup>) and the

6. See <http://www.inforpressca.com/sanjuancomalapa/demografia.php> for more details.

7. Martínez Pelaez (1994:443–470) convincingly demonstrates that the idea of *Reducciones* (indigenous settlements in zones under the protection of clergymen committed to guaranteeing some respect of freedom from slavery) was a mere trick played on indigenous people to impede them from escaping colonial rule and the new kind of slavery implemented through the *Encomiendas*. See Garzón et al. (2000:193–226) for more information on the sociolinguistic context of Kaqchikel in Comalapa.

8. See Section 3.4 for a definition of these terms.

9. Ten informants' speech from four varieties of Kaqchikel has been analysed here: Patzicia (Patz-), Tecpán (Tec-), San Juan Comalapa (SJC) and a hamlet of 515 inhabitants in SJC rural zone: Xenimakin (Xenim-); Santiago Sacatepéquez (Sant-). Gender (M = Mujer ‘female’, H = Hombre ‘male’), Urban or Rural residence (U and R) and age are encoded as follows: Patz-HU48 = a man from the urban center of Patzicia, aged 48; SJC-MU78 = a woman from

unmarked so-called Neutral TLVC (Sant-MU19). San Juan Comalapa belongs to the DS type as in (2): final *-m* is delabialized and further velarized (*-m > -n > -ŋ*); velars tend to palatalize rather freely before low vowels according to uvular coda-to-onset palatal dissimilation (*k > ky / \_\_\_ V<sup>Low</sup>Q*), from which the reader will find *iAq* (= *iäq*) in the vowel charts below (*kyäq* ~~red~~ = (dubbed the *iAq*, *iäq* variable in our sample encoding, with a Bartsch law<sup>10</sup> giving a light diphthong, or branching nucleus), and final *-w* is always devoiced (*w > f / \_#*).

- (2) Comalapa DS consonantal type: {- ŋ; -k, (ky); -w, -f}, i. e. {DELAB-VEL.-m#, Pal-CL.-#k, k' & UNVOIC.-w#}.

It is now time to turn in (3) to Kaqchikel consonants (shared by most Minor Quichean languages, though Poqom and K'iche' proper ~~have also~~ a laryngeal fricative /h/), in order to give the reader an idea of what segments can work as syllable boundaries for a tense or a lax nucleus. These criteria will have a strong influence on the analysis of the data, as *-VC-/#* (or Nucleus-Coda) chains will provide the major variables in our phonological survey of vowel allomorphy, accounting for variation in lax vowels.

- (3) Kaqchikel consonants: Broad phonetic transcription and orthographic correspondences.

	Labial	Dental	Alveopalatal	Velar	Uvular	Glottal
Stops	p	t, ts <tz>	č <ch>	k	q	
Ejectives	b'	t', ts' <tz'>	č' <ch'>	k'	q'	'
Nasals	m	n		ŋ <nh>		
Fricatives			š <x>	x <j>		
Approximants	w	l, r	j <y>			

Campbell (1977) provides detailed tables of lexical diffusion of (a) sonorant delabialization (*-m > n*) with velarization (*n > ŋ*), (b) onset palatalizing uvular coda-to-onset palatal dissimilation (*kaq < kyaq = 'red'*), and (c) devoicing of final approximants (*w > W, f*) as in (4). (~~Upper case W represents a devoiced labial glide.~~)

SJC, aged 78, etc. Inhabitants in 2004: 22,245 (Patzcía), 61,500 (Tecpán): see <http://www.mineco.gob.gt/mineco/analisis/departamentos/chimaltenango>.

10. Bartsch's Law refers to palatalization of velar onsets by front low vowels, which happened early in Gallo-Romance languages.

- (4) Three main consonantal variables sensitive to lexical diffusion in the Kaqchikel DN according to Campbell (1977). The layout of the figure is intended to roughly represent the geographic relationships of the different speech communities.

Poaquil			San Martín Jilotepeque
(void in data)			n, ŋ
ky, (k)			k
v, w, f			w, β, φ
Solola	Tecpán		
ŋ	n, ŋ		
k	k, (ky)		San Juan Comalapa
w, W	w, (f)		
Panajachel	Santa Catarina	Patzun	ŋ
n, m	ŋ	m, (n)	k, (ky)
k, ky	k, (ky)	k, (ky)	w, f
w, W	w, (p)	f, <del>v</del>	
	Santa María de Jesús		
	San Antonio Palopo		n
	m		k
	k, ky		w, β, φ
	w, (f)		

The consonant sets included in (4) show the scattered and progressive diffusion of innovations from west (Poaquil) to east (San Martín J.). San Juan Comalapa (SJC) has a cumulative, mixed set of reflexes, (ŋ; k, (ky); w, f), with obvious free variation, but Proto-Mayan *\*-m# > -ŋ* points to an innovative eastern type of mixed dialect – as does its selection of the ATR parameter in TLVC among other choices in the diasystem.

### 1.3 A chronological sketch of the Mayan phylum and dialect network

In explaining Martha's Vineyard diphthong laxing or intricate patterns of norm and variable shifts in Belfast or the BEV speakers network, the amount of common knowledge shared by an American or European scholar with his/her readership is enormous, though we too easily take it for granted. This is not the case when one endeavors to describe any sociolinguistic situation in the vastness of the Amerindian world. One cannot ignore – nor consider as obvious for everyone – pre-Columbian history and the long-scale continuity of human settlements

and forms of organization. It would simply be foolish to assume beforehand that the complexity of these patterns goes without saying, but it would be just as foolish to try to resolve this complexity in a few lines. We'll therefore cautiously start with the post-classic era, before the European invasion of Mesoamerica. But one can assume that most of the network patterning relevant for the Tense-Lax Correlation in Mayan languages, especially for the Eastern branch of the Stammbaum, started earlier.<sup>11</sup>

- Post-classic Era (1000–1450 A.D.) of intrusive Toltecan and Mexican elite dominance. Political fragmentation was high, and the internal complexity of the society increased with external pressures. The inner dialect network of Minor Quichean (Kaqchikel, Tz'utujil, K'iche') emerged out of complementarity of regional products in trade, craftsmanship and religion, with clear-cut political separation. In other words, a cooperative type of DN took place (specialization of marketplaces and small ceremonial centers), rather than an adversarial DN (through long-term separation by conflict or migration) or an intrusive dialectal layer (through language contact), although some conflicting political patterns between kingdoms and intrusive elites did interfere to a certain extent on local indigenous networks.
- Invasion of Central America by Europeans, conquest, genocide, and disintegration of the so-called “pre-Columbian societies.” Since 1523, when Pedro de Alvarado invaded the Guatemalan highlands, the social network was ruthlessly reduced by colonial wars and diseases from Europe. A colonial *ultra marem* province incorporated into Spain emerged where Amerindians were marginalized and forced into concentrated areas (*reducciones*), to be converted into formal or informal slaves for the sake of colonial agricultural industry (the colonial plantation era), which was the major resource of this Mesoamerican province of imperial Spain. At this stage, the Minor Quichean dialect network was scrambled by the regime of *reducciones*, *encomiendas*,<sup>12</sup> *haciendas*, etc. New settlements flourished everywhere, dragging people to colonial plantations. San Juan Comalapa, the spot we studied the most, was one of these; it was artificially built up in no time during the *Reduccion*es period.

11. See Blanton et al. (1993) for archaeological periods in Mesoamerica.

12. See B. Traven's novel, *The Rebellion of the Hanged* (1936), for a portrait of this kind of slavery disguised as farming.

- Independence of Guatemala in 1823, followed by the “Revolution” of 1871 by the Republic<sup>13</sup> of the dictator Justo Rufino Barrios.<sup>14</sup> Mayan populations were once more dispossessed of the few lands they had obtained in compensation for the *reducciones*.
- Since the beginning of the 19th Century, authoritarian conservative regimes, most of the time ruled by military *juntas*, have controlled the country in the interests of a small national elite. These interests are keenly shared by Guatemala's northern neighbors and by multinational firms, such as the well known United Fruit Company. Throughout this period, the social networks of Mayan populations have been regularly blasted, either because of hardening conditions in land ownership and difficulties in providing enough resources for survival, or by overt conflict, as in the *Violencia* from 1960–1996 (cf. Barth 2000<sup>15</sup>).
- Violence and state terrorism culminated in psychotic aggression against civilian populations in the highlands during the 1980s within the framework of the *Contra* war, as in El Salvador and Nicaragua. Counterinsurgency had its specific ethnic features in Guatemala (see Shirmer 1999), as it hit the Mayans particularly hard. 250,000 people died or disappeared, one million became refugees; over one million paramilitary troops became idle, frustrated, and unsteady after the conflict, as has been Latin America's lot since the last World War. From this last blow, the dialect network has not changed its configuration very much, but Mayan linguistic communities have entered an epoch of swift assimilation and acculturation (fostered by North American influence), conspicuous migration to the north to work in industry and services, and increased bilingualism with Spanish. Moreover, in 1973 the Guatemalan highlands were devastated by a tremendous earthquake, which erased most dwellings in Comalapa as well, further loosening local sociolinguistic networks.

13. A power shift took place along with the emancipation of colonial countries from the European ruling centers, turning them into Republics – from Mexico to the south of the American continent.

14. See Pendle (1980: 125–137).

15. See [www.odhag.org.gt/INFREMHI](http://www.odhag.org.gt/INFREMHI) for information on the project *Guatemala Nunca Más*, the most accurate report on state terrorism in Guatemala during those dark years of extremely intense repression, and <http://www.odhag.org.gt> (Human Rights Bureau of Guatemalan Archdiocese which is coordinating the project). The U.N.'s annual reports on Guatemala since 1995 are available at <http://www.amnestyusa.org/countries/guatemala/index.do>, and <http://hrw.org/doc/?t=americas&c=guatem> gives current news on topics related to human rights in Guatemala and elsewhere in the world.

In the meantime, forms of contacts between Mayan and non-Mayan pre-Columbian languages have lessened in shape and intensity, as multilingualism is nowadays focused on Spanish and English. But still, we can say that nearly all speakers of a Quichean language are able and willing to understand, or even casually use, another language of the same branch. Kaqchikels, K'iche's and Tz'utujiles do communicate in each other's language in a mutually intelligible diasystem, and Minor Quichean speakers of K'iche' or Achi can understand or even learn Q'eqchi' or Poqom. For example, many Poqomchi' speakers of Baja Verapaz reckon that they have to pick up Q'eqchi' to make any agreement in Alta Verapaz with their neighbors, especially for local trade.

Around the Atitlán lake, every Mayan speaker can understand or speak any of the three coexisting Minor Quichean languages (a dialect continuum): K'iche', Kaqchikel and Tz'utujil, as local populations have exchanged crafts, goods and partners probably since pre-Classic times or even before. The same can be said of speakers of Q'anjob'al languages in the Cuchumatán mountains of northwestern Guatemala, where most bilingual school teachers today, who often are Popti' speakers, do their best to pick up Chuj, Akatek or Q'anjob'al Proper, because most local youngsters have chosen to migrate northward. However, Mams cannot easily be understood by Ixiles, and K'iche's are not likely to make the serious effort required to learn to understand or speak Ixil properly. Ch'orti', in the southeast, cannot be understood by any other Mayan speakers apart from Chols, in northern Chiapas in Mexico, or Chontales in the Caribbean Mexican state of Tabasco, whom they never meet.

Mesoamerica has evolved through intense language contact between Amerindian languages to the point of shaping a linguistic area (Campbell 2006; Campbell 1979: 955–972; Campbell, Kaufman & Smith-Stark 1986). These former networks, which were the result of confederative links between towns and kingdoms, have been dismantled by the “Conquest.” With the colonial and the liberal eras, the inner structure of local sociolinguistic networks was again smashed into pieces. As with most Mesoamerican languages, Mayan languages survived as, one might say, the lowest language of the lowest people in a state of segregation. Only recently have they gained status and future prospects through a long process of political uprising from 1954 up to now, as far as Guatemala is concerned. Yet the stubborn policy of assimilation and ruthless military violence directed toward the Mayan population in the 1980s and early 90s fostered linguistic revival.

The complexity and compactness of such a Mayan linguistic community of 20 languages in Guatemala, in particular, the Minor Quichean linguistic community of Kaqchikel, is far away from the sociolinguistic patterns of a linguistic community such as New York City investigated by William Labov. Historically, with the grammar of a non-Indo-European language type such as Maya, open onto

quite different sociolinguistic worlds. Despite genocide, colonization, conservative authoritarian regimes, discrimination, policies of assimilation and acculturation, and massive economically and politically induced migration, Mayan languages are still widely and currently spoken, though they are still viewed by many Ladinos and Mayas themselves as a kind of vernacular. People still have to struggle against prejudice and the call of the assimilative ideology inherited from colonial times, which is unfortunately still supported by the dominant monolingual, Spanish-based, regime of formal education. But still, Mayan languages, even though in close contact with Spanish and in a time of increasing bilingualism (or diglossia) make up a sociolinguistic world of their own.

#### A descriptive framework of Kaqchikel vowel systems

The sociolinguistic variable we will be studying in the following pages is one of those ethnolinguistically idiosyncratic phonological variables: the Tense/Lax Vowel Contrast (TLVC) in syllable nuclei (i.e., vowels), a laxness correlation inherited from a former Proto-Mayan Vowel Length Correlation (VLC), as happened between classical Latin and Proto-Romance.

Some facts suggest that Kaqchikel (about 450,000 speakers) is an innovative *lingueme*<sup>16</sup> which developed out of a southwestern matrix, such as Atitek, the local variety of the main Tz'utujil town (over 25,000 inhabitants), as the result of expansion of the southwestern Minor Quichean segment of the diasystem to gain control of the territories to the east.<sup>17</sup> The direction of isoglosses from southwest of the Highlands on the shores of Atitlán to the east towards Sacatepéquez, and the structural unity with Tz'utujil both might support this claim. The Central K'iche' and Kaqchikel TLVC dialects, with reduced vowels as the product of short Proto-Mayan vowels, identify with the southwestern area of Macro-Quichean along with other isoglosses, whereas the VLC (Vowel Length Correlation) dialects to the east in Sacatepéquez tend to neutralize duration, though without laxing of nuclei.

Kaqchikel TLVC systems have been thoroughly described in current literature (ALMG, Majzul Patal et al. 2000; Matzar & Rodríguez Guaján 1997; Cutzal 1990; Macario, Cojti & López 1990; Campbell 1977), but unfortunately no experimental measurements have been ever done of lax and tense vowel reflexes,

16. The term *lingueme* was shrewdly coined by Mario Alinei in order to neutrally refer to any language or dialect from a typological and genetic point of view, without discussing questions of ethnolinguistic identity (Alinei 1984).

17. Sper (1970) confirms this general trend of Kaqchikel dialect networks expanding innovations from a core area located around Sololá and Lake Atitlán towards the eastern highlands.

which seriously questions the credibility of the data available in current literature. Vowel systems throughout the Kaqchikel diasystem are impressionistically called 10-vowel systems (8 varieties: Patzun, Sololá and Lake Atitlán, San José Poaquil, San Andrés Itzapa), 9-vowel systems (San Martín, Santa María, Santo Domingo), 7-vowel systems (San Miguel Pochuta, San Pedro Yepocapa), 6-vowel systems (Tecpán, Patzicía). See (5).

(5) Vowel systems in Kaqchikel, according to Majzul Patal & al. 2000: 35–39.

6-Vowels			7-Vowels			9-vowels			10-vowels		
i	í	u	i	í	u	i	u	u	i	u	u
e		o	e	ə	o	e		o	e	ɛ:3	o
							ə	ɔ		ə	ɔ
	a			a			a			a	

All these systems are surface expressions of a primary system ruled by VLC (Vowel Length Correlation) as in (6), for which some authors postulate a kind of retracted central vowel, as does Terrence Kaufman for Proto-Tzeltalo-Cholean (Kaufman 1972).

(6) Proto-Mayan Vowel system

PM Vowel system		
*ii		*uu
*i		*u
*ee	*V-lax (?) as an *a allophone	*oo
*e		*o
*a		*aa

We shall toe this philological line, assuming a VLC, and put aside the extra central vowel integrated into other kinds of correlative oppositions with the rest of the system, as in contemporary Chol, Chontal, Mopan, Itzaj, and Lakantun. We shall cling to the VLC, following the yellow brick road it traces for our quantitative, experimental survey. We hope this first approach, relying mostly on measurements, will prove helpful for better understanding the mechanism of the TLVC in Central K'iche' and Kaqchikel, two major DN of the highlands.

Faithful to Labovian methodology, we take vowel shifts, grammatical paradigms, lexical diffusion, contextual segmental variation and additional clues such as duration, into consideration as we sample from speakers interviewed under similar conditions. We used a 110 item phonological questionnaire, occasionally

shortened to 70 or 50 items if informants did not have enough free time or willingness to answer. The stimuli of the word list were uttered either in Spanish or in Kaqchikel, according to the degree of bilingualism of the informant, by three alternating fieldworkers: Jean Léo Léonard and Cecilio Tuyuc Sucuc, and another member of the Kaqchikel ALMG (Academy of Mayan Languages of Guatemala) in Chimaltenango (Victor Roquel). In order to avoid blanks and words difficult to translate from Spanish or to elicit in Kaqchikel, many items were withdrawn from the questionnaire's first draft, which included a section on verbal inflection.<sup>18</sup> We soon realized that the best we could do, in order to get consistent results for such an exploratory attempt to grasp the patterns of the TLVC in Kaqchikel (*//aa//*<sup>19</sup> > */a/*, *//a//* > */ä/*), was to limit our inquiry to a strategic – we dare say, prismatic – aspect of this dialectal constraint. TLVC will require more experimental research in the future (especially articulatory gestures) and in a more extensive way than what we are committed to doing in the limits of this paper.

Moreover, TLVC is a major typological feature of two significant Minor Quichean languages: Kaqchikel and K'iche'.<sup>20</sup> The 6 vowel, 7 vowel, 8 vowel and 9 vowel varieties listed above can be considered as a sociolinguistic reality; Kaqchikel speakers are able to place other speakers according to this trait, just as New Yorkers easily give themselves away when uttering words containing postvocalic */r/*, or when Southerners come across the Northern Cities Shift, a change involving no less than 34 million people. Kaqchikel TLVC involves roughly half a million people, but in a much smaller territory. It echoes from a deep time-scale punctuated by cycles of settlement, cell-splitting, unification and koineization, fragmentation, and subordination to elite, foreign pre-Columbian and postcolonial languages. It is drowning in diglossia and struggles against acculturation, but it is still alive,

18. As far as we can tell from data on paradigms other than nominal possession (as listed in (8) below), it seems that the Possession Laxity Neutralization is not applied in verbal inflection, though a similar set of prefixes is involved in a split morphology pattern, since nominal possessive suffixes also happen to be ergative agreement marks in finite forms.

19. *//aa// versus //a//* with the double slash notation refers to a higher level of abstraction in the phonological analysis of the tense/lax vowel correlation in the Kaqchikel diasystem than <a> (tense) versus <ä> (lax) in current Kaqchikel script. The so-called “tense vowels” such as <a> are therefore underlying long vowels as *//aa//*, whereas the “lax vowels” such as <ä> are underlying short vowels, i.e. *//a//*.

20. Lax vowels turned out to be a hard morsel to chew for spelling reforms during language planning, which has been taking place mostly since the 1980's, thanks to institutions of applied linguistics such as Proyecto Francisco Marroquin, ALMG, and OKMA. See <http://www.okma.org/> for more information about this non-governmental organisation of Mayan linguists – one of the most productive in the Amerindian field of applied linguistics.

with a multiplex diasystem and strong grammatical constraints, as the following section will highlight.

### 3. A Grammar of Lax Vowels (GLV) in Kaqchikel

#### 3.1 Lexical and functional affixal heads

As the reader has easily guessed, a Grammar of Lax Vowels (GLV) turns out to be nothing more than a grammatical account of TLVC. How is the **Tense/Lax** vowel contrast implemented in the lexicon and in functional or derivational heads? Is laxity related to stress? We answer with (7) and (8), giving a wide array of morpho-lexical constraints.

#### (7) Kaqchikel GLV constraints

- Stress: Kaqchikel is a word-final stress language. Lax //a//, i.e., /ä/, as the nucleus of a lexical monosyllabic root (*jäl, chäj, kär, kyäq, säq, qän, räx*, etc.) is therefore always stressed if not derived (*saqsöj* ‘whitish’), nor compounded (*saqmoloj* ‘egg’). In such cases, stress proceeds rightwards to the suffixal or last compound word’s syllable (i.e. *saqsöj, saqmoloj*).
- Morphology: The TLVC is implemented in the lexical structure of lexical roots and functional affix heads, as evidenced in Table (8) below.
- Inflectional lexical-head distributed neutralization of laxity: Possessed nouns neutralize vowel laxity, while argument agreement inflection in verbs does not. Kaqchikel, like many other Mayan languages including very distant ones like Tének (Huastek), neutralizes vowel shortness or laxity in possessive phrases (PossP).

In other words, to make (7c) clear once and for all, laxity in Kaqchikel is implemented in morphosyntax as an unpossessed NP distinctive markedness condition that is neutralized in an inflected VP, although the VP ergative marking actually uses similar prefixal heads for agreement expression. We could therefore say that Kaqchikel is a **Morphophonologically Split Possessivity Language**, with strong iconic consequences on morphosyntax and discourse (for many words, lax nuclei tell the listener that what is being talked about is not involved in dependency marking of the possessive type). This is a most handy trick for a language to contrive, since it increases control over PossP, NP, and DP in discourse through NP and DP iconicity versus PossP. All Minor Quichean languages have a very intricate system of determination, deixis, and focus nourished by a wide array of proclitics and particles, so that the hiring of tenseness/laxity to play a head-identifying role in phono-lexical and morpho-lexical markedness is theoretically

welcome. Empirically, the trick works quite well, and it is by no means recessive, though there are cases of lexicalization of some items, from place to place and from lexical item to lexical item.

The reader will find examples of (7b) and (7c) in (8) below. *C<sup>Dupl</sup>* refers to reduplication of the onset of the root into the onset of the suffix, a form of hypocoristic adjectival derivation in many Mayan languages.

- (8) A Grammar of Lax Vowels (GLV) in Kaqchikel, according to Matzar & Rodríguez Guaján (1997:42–49).

Morphological variable	Example	Label
i. Transitive stems ending in C (except with glottal stop)	<i>x-u-jäq</i> ‘he/she opened (it)’ <i>x-u-tzët</i> ‘he/she saw (it)’	Trans-Stem-C#
ii. Intransitive verbs derived from onomatopoeic stems	<i>x-witz’-itz’</i> ‘rats or mice squeaking’ <i>x-bä-tät</i> ‘bursting of fireworks’	Intrans-Onom.Der. Stem
iii. Intransitive passive verbs: - <i>bäx</i>	<i>x-pa-bäx</i> ‘it was (being) stopped’ <i>x-tz’i-bäx</i> ‘it was (being) written’	Intrans-pasv.Verbs
iv. Completive passive: - <i>täj#</i>	<i>x-chaä-täj</i> ‘it (had been) chosen’ <i>x-tij-täj</i> ‘it (had been) eaten’	Compl-pasv.- <i>täj#</i>
v. Positional adjectives: - <i>Vl#</i>	<i>jaq-äl</i> ‘open’ <i>tz’ap-äl</i> ‘closed’ <i>xim-il</i> ‘tied up’ <i>jor-öl</i> ‘weak’	Pos-Adj.- <i>Vl#</i>
vi. Descriptive adjectives: - <i>C<sup>Dupl</sup>ik#</i>	<i>naka-nik</i> ‘stupid’ <i>koto-kik</i> ‘twisted’ <i>bölo-b’ik</i> ‘cylindrical’	Descr-Adj.- <i>C<sup>Dupl</sup>ik#</i>
vii. Moderative adjectives: - <i>C<sup>Dupl</sup>öj#</i>	<i>kaq-köj</i> ‘reddish’ <i>saq-söj</i> ‘whitish’ <i>tz’il-tzöj</i> ‘rather dirty’	Moder-Adj.- <i>C<sup>Dupl</sup>öj#</i>
viii. Superlative adjectives: - <i>läj#</i>	<i>utz-iläj</i> ‘very good’ <i>nima-läj</i> ‘very big’ <i>käyi-läj</i> ‘very bitter’	Superlat-Adj.- <i>läj#</i>
ix. Intransitive verbs derived from adjectives (“versive”): - <i>Vr#</i>	<i>x-k’iy-ir</i> ‘it got plentiful’ <i>x-nim-är</i> ‘it got bigger’ <i>x-q’eq-är</i> ‘it got black’ <i>x-q’eq-um-är</i> ‘it darkened’ <i>x-tew-ür</i> ‘it got chilled’	Versive- <i>Vr#</i>



x. Perfect participle: -(V)n-äq#	<i>war-in-äq</i> 'he/she slept, is sleeping' <i>el-en-äq</i> 'he/she went out' <i>pet-en-äq</i> 'he/she came in' <b>oq<sup>2</sup></b> <i>on-äq</i> 'he/she cried' <i>ok-in-äq</i> 'he/she entered'	Perf-Part.(V)n-äq#
xi. Noun stems-short *V	<i>äk</i> 'chicken' <i>kinäq</i> 'bean' <i>winäq</i> 'person' <i>wäy</i> 'tortilla' <i>k'im</i> 'straw' <i>umül</i> 'rabbit'	N-stems-*V
xii. Agentive-öy/üy: -öy/üy#, -öl/-ül#	<i>b'an-öy/b'an-öl</i> 'maker' <i>loq<sup>2</sup>-öy/loq<sup>2</sup>-öl</i> 'buyer, client' <b>su<sup>2</sup></b> <i>üy/su<sup>2</sup>-ül</i> 'washer'	Agent-öy/üy#, -öl/- ül#
xiii. Infinitive of intransitive and antipassive (-Vn-) verbs: -ik#	<i>war-ik</i> 'to sleep' <i>choy-on-ik</i> 'to cut' <i>chul-un-ik</i> 'to urinate'	Inf-Trans.Verbs-ik#
xiv. Instrumental/locative noun suffixes: -Vbäl#	<i>su<sup>2</sup>-übäl</i> 'washing device' <b>mes<sup>2</sup></b> <i>ebäl</i> 'broom, brush' <i>kay-ibäl</i> 'shop' <i>chaj-obäl</i> 'laundry'	Instr/Loc-N-Vbäl#

TLVC patterns are highly grammatical, involving a wide array of affixes and combined with vowel harmony (or, to put it more properly, *vowel copying*) and consonant reduplication in adjectives. Through derivation, all lexical categories are concerned with conversion or change of morphosyntactic voice; semantic roles such as instrument and agent are involved for nouns, semantic gradation for adjectives (superlative and moderate), and Aspect-Voice for verbs.

We can straightforwardly say that vowel laxity turns out to be one of the strongest pillars of the Kaqchikel and K'iche' lexicon and grammar structure, a Grammar of Lax Vowels (GLV). Moreover, as stress regularly falls on the last syllable in Kaqchikel, all suffixal lax vowels are actually stressed nuclei, so that unlike languages such as Portuguese or Russian, laxity has nothing to do with prosodic intensity or strength constraints in Mayan languages. Neither does it seem to be easily explained by phonotactic rules in the first place, since lax vowels can occur in noun stems without regard to onset or coda (even if surrounding consonants may have a slight influence on the quality of the nucleus, as we shall see when surveying vowel charts). On the contrary, even the neutralization of lax vowels

in Kaqchikel is largely bound up with additional grammatical constraints of the morpho-semantic type, such as possession.

As a matter of fact, one could argue that variables such as (xi) *N-stems-\*V*, (i) *Trans-Stem-C#*, (ii) *Intrans-Onom.Der.Stem*, (v) *Pos-Adj.-Vl#* and derivational affixal variables such as (vi) *Descr-Adj.C<sup>Dupl</sup>ik#*, (vii) *Moder-Adj.-C<sup>Dupl</sup>öj#*, (viii) *Superlat-Adj.-läj#*, (ix) *Versive-Vr#*, *etc.*, far from being grammatical, should rather be considered as lexicalized forms dependent on word-building resources in the lexicon. The assertion that we are dealing with a major grammatical paradigm would therefore collapse like a house of cards, forcing us to ask Grammar to keep a low profile; our claim for a Grammar of Lax Vowels (GLV) in Kaqchikel would therefore shrink into a mere enumeration of radical and affixal paradigms embedded in the lexicon. Nevertheless, a major constraint confirms that our claim for GLV is legitimate: the Mayan Possession Duration Contrast (MPDC), according to which "in Mayan languages that manifest vowel length, there is a group of nouns with long vowels when possessed and short vowels when not possessed" (Brown & Wichmann, 2004: 162; quoting Terrence Kaufman). Therefore, <ä><sup>21</sup> = //a//, whereas <a> as well as <a> Poss. = //aa//.

### 3.2 Lax noun phrase and tense possessive noun phrase

(9.1) provides a list of 14 inflectional pairs according to the MPDC; lexical inputs (phonological forms) stand between slashes; //kar// > [kæř, kəř, k3ř, kuř, kuř] = (*kär*) – ř stands for a fricative vibrant – as a sociolinguistic variable referred to as (Ar) in vowel charts below; //nukaar// > [nukař] = (*nukar*), i.e. (*ar*) as an allophonic variable used in vowel charts.

#### (9.1) Underlying Inflectional VLC in Noun Poss.P in Kaqchikel (MPDC)

Monosyllabic stem		Meaning
Unpossessed	Possessed	
//kar// (kär)	//nukaar// (nukar)	'fish'
//xal// (jäl)	//nuxaal// (nujal)	'ear of corn'
//waj// (wäy)	//nuwaaj// (nuway)	'tortilla'

21. Brackets < > refer to the current spelling used in reference grammars and texts published in Kaqchikel according to Kaufman's proposals for the codification of Mayan languages (see Kaufman 1976).

//pak// (päk)	//nupaak// (nupak)	'anona'
//čax// (chäj)	//nučaaax// (nučaj)	'pine'
//k'ax// (k'äj)	//nuk'ax// (nuk'aj)	'corn flour'
//wuj// (wüj)	//nuwuuj// (nuwuj)	'paper, book'
//laq// (läq)	//nulaaq// (nulaq)	'bowl'
//tsaq// (tzyäq)	//nutsaaq// (nutzyaq)	'garment, cloth'
<b>Disyllabic stems</b>		
//awan// (awän)	//nuawaan// (nuawan)	'milpa, corn field'
//waran// (warän)	//nuwaraan// (nuwaran)	'dream'
//čakač// (chakäch)	// nučakaač// (nuchakach)	'basket'
//kinaq// (kinäq)	//nukinaaq// (nukinaq)	'bean'
//winaq// (winäq)	//nuwinaaq// (qawinaq)	'person'

The table in (9.2) supplies sets of variables encoded according to the rhyme (nucleus + coda). The word *kär* 'fish' with a lax vowel encoded as (*är*) in the table and (*Ar*) in the vowel charts, alternates into a phonologically tense form when possessed, branching a possessive prefix on its left, identified as (*ar*) in tables and subsequent vowel charts.

(9.2) Encoding of phonotactic variables and syllabic rhyme types: A sample.

<b>Monosyllabic stem</b>		Meaning
Unpossessed	Possessed	
(kär) > (är), (Ar)	(nukar) > (ar)	'fish'
(jäl) > (äl), (Al), etc.	(nujal) > (al)	'corn ear'
(wäy) > (äy)	(nuway) > (ay)	'tortilla'
(päk) > (äk)	(nupak) > (ak)	'anona'
(čäj) > (äj)	(nučaj) > (aj)	'pine'
(k'äj) > (äj)	(nuk'aj) > (aj)	'corn flour'
(wüj) > (üj)	(nuwuj) > (uj)	'paper, book'

(läq) > (äq)	(nulaq) > (aq)	'bowl'
(tsyäq) > (iäq)	(nutsyaq) > (iaq)	'garment, cloth'
<b>Disyllabic stems</b>		
(awän) > (än)	(nuawan) > (an)	'milpa, corn field'
(warän) > (än)	(nuwaran) > (an)	'dream'
(čakäč) > (äch)	(nučakač) > (ach)	'basket'
(kinäq) > (äq)	(nukinaq) > (aq)	'bean'
(winäq) > (äq)	(qawinaq) > (aq)	'person'

Table (10) shows the syllabic integration of noun stems used in our experimental survey.

(10) A sample of syllabic patterns of noun stems for the lax vowel /ä/ = //a//

<b>Codae</b>					
Coronal sonorant	Palatal affricate	Palatal approximant	Dorsal fricative	Dorsal stop	Uvular stop
warän		wäy		päk	
jäl, kär					läq, kinäq, säq
	chakäch		chäj		
	jäch'				
					käq, k'äq
(q'än)					

### 3.3 Idiolects for lumpers

Science faces two parties, each fiercely defending its own position: Splitters *versus* Lumpers.<sup>22</sup> Splitters love details, idiosyncrasies, and peculiarities, and defend their highly delicate taste on behalf of the accurateness of atomism and the aesthetics of enumeration. Lumpers, on the other hand, prefer broad classification, wide clustering, large prospects, and the power of elegant generalization. We shall assume here that idiolects should not be considered as minimal individual units of a language or a dialect, according to the classical "Splitters' viewpoint", which dominates as soon as one takes idiolects as an empirical source in sociolinguistic survey. Paradoxically, idiolects should be considered with a Lumper's viewpoint rather than with a Splitter's framework, and we should above all attempt to trace in any idiolect the most indicative properties of the general structure of a

22. See Greenberg (2005: 115–117) and Gould (2003).

language – *lingueme* or *diasystem*, etc. – when handling idiolectal data, in order to fathom how the diasystem actually works. In the classical framework, which has definitely relinquished idiolects to the Splitters, while Lumpers proceed in their inquiry to reach higher, more abstract and homogeneous constructs on language, idiolects have been limited to social, ethnic, and individual properties, i.e., with sociolinguistic surface level issues rather than with underlying diasystemic patterns. In this respect, each detail of idiolectal variation should therefore hint at more than mere superficial stylistic features and attitudes, providing specific clues as to the position of the informant in the available network of statuses and socially correlated linguistic variables making up the sociolinguistic chessboard.

### 3.4 The ATR and RTR dialect conspiracy

We'll use Advanced Tongue Root (ATR) and Retracted Tongue Root (RTR) criteria to capture lax vocoids in (11). Let it be clear that [+ATR] refers to relatively increased highness, and [-ATR] to relatively lowered highness, whereas the [+RTR] feature applies to non-peripheral, that is, neither front nor back vocoids, i. e., centralized vowel types, such as schwas and retracted front and back vowels (*ɨ*, *ɤ*, etc.), while [-RTR] goes for peripheral vocoids, with sharp chromatism (*i*, *u*, *e*, *o*, *a*). Although we do not have previously investigated articulatory gestures in which to ground this classification, we'll look upon these criteria merely as phonologically handy ones – not phonetic ones.

(11) Kaqchikel allophonic vowel space

V-Features	+Front		+Back		
	-RTR	+RTR			-RTR
+High +ATR	i	ɨ	ɯ	uu	u
+High -ATR	ɪ	ɨ̠			ʊ
-High +ATR	ɛ̠	ẽ			
-High -ATR	e	ə		ɤ	o
-Low +ATR	ɛ̠	ɜ̠		ʌ	ɔ̠
-Low -ATR	ɛ	ɐ			
+Low	æ	a	ɛ̠	a	

We gave the playful title of *The ATR and RTR dialectal conspiracy* to this section in order to make our point clear; complementary interactions between parameters selected by dialect varieties in the diasystem are more important than how many vowels a variety may have. Dialects play with structural variables, constraints, and parameters such as ATR and RTR, dispatched all over lexical, grammatical, and phonological patterns in a sociable and fashionable game, rather than losing time counting vocoid types and allophones to fit in a 6-Vowel or 9-Vowel type. This gambling of nuclei types happening in the Kaqchikel phonemic vowel conceptual space appears in (12).

In order to clarify how the Kaqchikel diasystem (DS) works, a great deal of what will follow concerns details of the categorial (the conceptual side of the DS) and segmental (the perceptual side of the DS) phonological integration of a mixed TLVC/VLC system. Neogrammarians would be equally satisfied and disappointed; the length correlation of Proto-Mayan (VLC) did shift to a Tense/Lax Contrast (TLVC) at the segmental level, but it still smoulders under the surface of actual duration and a High tone feature associated with the lax vowel. Moreover, we are just unveiling these aspects of Kaqchikel; a DS matrix like (12) is only part of a greater Minor Quichean vowel shift which still awaits phonetic scrutiny.

(12) Kaqchikel phonemic vowel conceptual space

Features	+Front		+Back	
	-RTR	+RTR	-RTR	+RTR
+High +ATR	ii	<ä> Patzicía		uu
+High -ATR	i			u
-High +ATR	ee	<ä> Tecpán		oo
-High -ATR	e		o	
-Low +ATR	<ä> SJC			
-Low -ATR	<ä> Santiago	a		
+Low	aa			

From this matrix, we can sketch a typological classification of varieties surveyed in our sample, as in (13):

- (13) TLVC-types in Kaqchikel
  - a. RTR Raising, as in Patzicía (HU48): High RTR
  - b. RTR Mid, as in Tecpán (HU30): Mid RTR type
  - c. ATR /-Low, as in San Juan Comalapa and Xenimakin: -Low ATR type
  - d. Neutral, slightly ATR/-Low, as in Santiago Sacatepéquez: Neutral TLVC type

#### 4. Some perceptual properties of the Kaqchikel phonemic vowel conceptual space

##### 4.1 Diasystemic parametering of TLVC parameters

The Kaqchikel phonemic vowel conceptual space above in (11) and (12) is evidenced by ~~four~~ vowel charts<sup>23</sup> below in (24) and (25). If we convert the allophonic configurations of these vowel charts into the cells of the tables in (11) and (12) above, idiolects can be defined according to the parameters listed in Table (14) below, which accounts for idiolectal variation in SJC. In this description, idiolects of SJC (urban) and Xenimakin (rural) are integrated into a diasystemic network with a few parsimonious parameters. This variety is typically a Low-V Palatal dialect, since /ä/ is expressed phonetically as a palatal reflex: mostly [ɛ, e], or [ɜ]. The matrix reads as a glimpse into the inner variation of a Low-V Palatal dialect – a phonetically driven diversity which does not challenge the phonological constraints on nuclei. This collection of idiolects shows a consistent trend towards further merging of units like (i) and (e), indecision as how to deal with the ATR/RTR properties of (i), and further indecision as to setting a higher or lower target for (ä). The αRTR<sup>light</sup> parameter in SJC is hardly audible, so that it should be considered as a subtlety for phoneticians. The lexicalization of possessed noun neutralization occurs according to clear local patterns; in SJC, *nukär* instead of *nukar* ‘my fish’, *nukyäq* instead of *nukyaq* ‘my guayaba’, *nuawän* and *rawän* instead of *nuawan* and *rawan* ‘my/his maize crop’, etc., whereas in Patzicía, *nuchäj* instead of *nuchaj* ‘my pine’. According to Kaqchikel LVG, (ä) is a phonetically short, lax expression of //a//, whereas (ä) Poss. refers to the neutralization of laxity and lengthening of the nucleus triggered by possessive prefixation (Poss.). Lengthening and tension drives (ä) to the same categorial field as (a) in the //aa// class of reflexes. Cf. Section 3.1.

23. Thanks to Cedric Gendrot’s scripts on Praat and most valuable help in designing the vowel charts (UMR 7018, CNRS-Paris 3).

As a matter of fact, the small pull-and-drag game of parameters does not suffice to show that any overt variation is happening in the linguistic community. What is clearly seen instead is a structural negotiation between Kaqchikel speakers on details as to how – and how high – one shall raise an (ä) palatally with a [+ATR] gesture instead of RTR raising towards the velum, as in the Tecpán and Patzicía dialects.

(14) Idiolectal variation: 7 informants, SJC-Xenimakin

Variables	(i) = //i//	(e) = //ee//	(ä) = //a//	(a), (ä) Poss.	(ö) = //o//	(ü) = //u//
SJC-HU-52	-ATR (e) merger	(i) merger	-Low	αRTR <sup>light</sup>		
SJC-HU-62		+ATR	αRTR -High -ATR	βBack	-Low	
Xenim-HR-12	+ATR	-High +ATR	-Low +ATR			(no lax V)
Xenim-MR-15	+RTR		αRTR			
SJC-MU-27	αATR (ix) +RTR (is)	+ATR	-Low +ATR		-Low +ATR	
SJC-MU-25	αRTR	αATR	-Low +ATR (i) & (e) merger	αRTR <sup>light</sup>	-Low +ATR (o) merger	+RTR (üw)
SJC-MU-78	-ATR	+ATR	-Low +ATR		+Low	

In the SJC-HU52 idiolect (shown in (15)), an α ATR /V-Low type as we dubbed it above, the whole array of acoustic clues on the vowel continuum ranging from /a/ to /i/ sorts into two natural classes: //aa// = (a), (ä)Poss., where low variances around a mean F1 = 680 Hz and a mean F2 = 1440 Hz suggest a single [+Low] class; whereas (ä) and (e) make up a separate, disparate class, with F1 and F2 differing from up to 75 Hz and 160 Hz ((ä) as compared to (e)) on a [α ATR/-Low] scale.

(15) SJC-HU52: a F1-F4 continuum of the Low-V palatal type

SJC-HU52	F1	F2	F3	F4	Tokens
(a)	685	1390	2365	3680	35
(ä)Poss.	675	1490	2340	3730	8
(ä)	545	1770	2435	3520	20
(e)	470	1930	2605	3595	20

(16) Patzicía-HU48: a F1-F4 continuum of the [α RTR] type

Patzicía-HU48	F1	F2	F3	F4	Tokens
(a)	575	1350	2430	3350	30
(‘a) <sup>24</sup>	675	1310	2510	3350	20
(ä)Poss.	620	1460	2545	3320	32
(ä)	420	1260	2525	3310	77
(u)	420	955	2415	3250	18
(‘u)	380	740	2530	3245	6

#### 4.2 An RTR Raising Kaqchikel dialect: Patzicía

The quality and quantity of the data from ~~Patzicía a HU48~~ and the strength of the RTR Raising parameter of his idiolect induce us to strongly rely on his speech for the analysis of subtle acoustic parameters, such as F3 and F4, in addition to F1 and F2, which are usually the sole parameters taken into account for vowel charts. But vowel charts are artifacts of limited scope; further research is needed to adequately fathom the complexity of the parameters at stake.

(17) (ä) phonotactic variation in a High.RTR dialect of Kaqchikel: Patzicía-HU48 : /ä/ (according to coda contexts) *versus* mean (‘a) by RTR variables. ~~Cf. Vowel Chart (1).~~

	Patz-HU48	F1	F2	F3	F4	Tokens
/ä/ in various coda contexts	(än)	380	910	2350	3245	12
	(äl)	415	1245	2405	3175	3
	(är)	405	1280	2575	3235	8
	(äy)	400	1470	2470	3510	5
	(äx)	400	1400	2480	3090	2
	(äch)	380	1575	2385	3220	4
	(äch’)	420	1400	2495	3285	6
	(äj)	420	1360	2620	3370	8
	(äk)	415	950	2460	3320	4
	(äq)	475	1325	2650	3375	27
	(qän)	415	1195	2575	3415	4
	(wär)	395	930	2475	3170	5
	Mean /ä/, i.e., //a//	410	1255	2495	3285	88

24. (‘a) codes the stressed “tense” low vowel written as <a>, analyzed as //aa//. (‘u) is defined similarly.



Mean (‘a) = stressed /a/, i.e., //aa//	675	1310	2510	3350	20
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Table (17) and the ~~Patzicía a HU48~~ vowel chart below (Vowel Chart (1)) both clearly show the basic phenomenon at stake in an RTR variety like Patzicía: the 410 Hz threshold for F1 in /ä/. We have here a genuine High.RTR type of TLVC. The RTR features are visible in (18) from F2 clues. While all F1 values stand close to 400 Hz (except (äq), which is heading towards a schwa at 475 Hz), F2 values swing widely backward from a strongly backed 910 Hz (än) or 950 Hz (äk), to a more fronted (i.e. palatal) target, at about 1575 Hz (äch). Onsets may account for more of this variation than we initially assumed, as the variables (qän) = qän ‘yellow’ and (wär) = wärän ‘sleep, dream’ suggest; the peripheral onset (labial or uvular) drives F2 close to the /u/ vocalic range. But the dominant influence of the coda (and its primacy over the onset) is to be seen in items like (äch), (äch’), which are driven closer to [i] than [ɯ] by the palatal affricate in spite of the velar onsets (chakäch = ‘basket’, jäch’ = ‘maize harvest’).

(18) F2 variation in a High.RTR dialect of Kaqchikel, Patzicía, (HU48)

Patz-HU48	F2
warän	910
jäl	1245
kär	1280
wäy	1470
räx	1400
chakäch	1575
jäch’	1400
chäj	1360
päk	950
läq, kinäq, säq	1325
qän	1195
wär	930
/ä/	1255
(‘a)	1310

The rather wide array of tongue positions expressed by shifts in F2 means that /ä/ in ~~Patz HU 48~~ speech as a +High, +RTR vocoid moves along a palatal-velar continuum, conditioned by coda-nucleus and onset-nucleus interactions, as in (19), where values at the right side of >> tend to be less palatal and more RTR, or centralized.

- (19) F2 variation in a RTR dialect of Kaqchikel as a palatal-velar continuum,<sup>25</sup> Patzicia, (HU48)

~~Patzicia, a HU48~~

Palatal RTR	Velar RTR								
(Hz) 1575	1470	1400	1360	1325	1280	1245	1195	950	930
chakach >>	wäy >>	jäch,	chäj >>	kinäq >>	kär >>	jäl >>	qän >>	päk >>	wär
	räx >>								

In an RTR language, F3 and F4 may be particularly interesting acoustic variables to observe, as F3 is generally linked with lower resonances and provides hints of bemolization,<sup>26</sup> a strong harmonic consequence of both labiality and RTR or centralized articulatory gestures that is associated with wider cavities and subcavities, either nasal or oral. As compared to the regular scaling of the ~~four first~~ formants in /ä/ and (‘a), phono-lexical variables in (17) demonstrate a strong tendency to fluctuate; F3: 2350-2575 Hz (*än-qän*) and F4: 3090-3510 Hz (*äx-ay*). F3 and F4 seem to increase with velarity. F3 moves up and down around the mean value, showing not as nice a Gaussian shape as F2, but it is undoubtedly sensitive to uvularity (*läq, kinäq, säq*), velarity (*chäj*) and rhotic retroflexion (*kär*) in the coda. The main correlative acoustic parameters observed in (17) are listed in (20) below.

- (20) F1-F3 phonotactic variation in an RTR idiolect of ~~kaqchikel~~: additional hints at the RTR continuum, ~~Patzicia, (a HU48)~~

Acoustic parameter	F1	F2	F3
	Aperture	Front-Back	Round/Unround
Physical phonological properties	Highness	Frontness-backness	Increased resonator shape
	Sonority scale	Chromatic scale	
	→ Latitudinal position of the tongue	→ Longitudinal position: Palatal-velar continuum	→ Uvularity, fricative velarity, and rhotic retroflexion

25. Of course, Patzicia-HU48 is *phonologically* an RTR dialect, and as such, should not be mixed up with such so-called “palatal-ATR dialects” as SJC, but the Patzicia dominant RTR type does not impede an actual *phonetic* coarticulatory palatal-velar continuum, according to coda-to-onset palatal dissimilation rules and onset control over the nucleus, as shown in (20).

26. I.e. lowering of higher frequencies (F2, F3, F4).

#### 4.3 A Mid RTR Kaqchikel dialect: Tecpán

Our speaker from Tecpán is a young educational advisor in bilingual education. Aged 30, born in Tecpán, he lived part of his youth in Antigua as a student, but his idiolect qualifies well as a Tecpán sample variety. As the vowel chart and (21) and (22) show, it belongs to the Mid RTR dialect, with /ä/ reflexes turning up and down around a vocoid of the schwa type, i.e., as mid centralized vowels.

- (21) F1-F4 variation in a Mid RTR dialect of Kaqchikel: Hints at the RTR Continuum, Tecpán (Tecp-HU30, cf. Vowel Chart (2))

Tecp-HU30	F1	F2	F3	F4	Tokens
(a)	705	1570	2390	3610	27
(‘a)	770	1605	2435	3600	17
(ä) Poss	721	1580	2395	3480	23
/ä/	540	1690	2540	3555	36
(‘e)	490	2185	2585	3340	9

- (22) F1-F4 (ä) phonotactic variation in a Mid RTR dialect of Kaqchikel, cf. Vowel Chart (2)

Tecpán-HU30	F1	F2	F3	F4	Tokens
äm	620	1260	2550	3520	1
är	570	1680	2575	3380	6
äl	490	1655	2485	3575	3
äy	460	1590	2440	3670	8
äj	466	1775	2690	3615	3
äk	510	1425	2515	2515	3
äq	600	1795	2565	3470	17
/ä/	530	1560	2545	3340	41
(‘a)	770	1605	2435	3600	17

In this idiolect, F1 has a bell-shaped distribution, from labial (*äm*) to uvular coda (*äq*), so that the more peripheral the coda, the relatively more open the lax low vowel. By contrast, the F2 peak proceeds with a more broken line of values, but the effects of the palatal-velar continuum already observed in Patzicia still account for the variation; the more coronal the coda, the more fronted the nucleus, with higher F2 values (*är, äl, är, äy*). But the highest values are triggered by a velar fricative (*äj*) or a uvular stop (*äq*). A velar fricative has a raising effect on F3 (*äj*), followed by the rhotic coronal context (*är*) and the uvular stop (*äq*), confirming specific markedness conditions for these contexts.


4.4 A neutral dialect: Santiago Sacatepéquez

Table (23) provides F1-F4 values for low vowels in a so-called “neutral” dialect, from which laxity can hardly be found: Santiago Sacatepéquez. In this idiolect, where the //aa// versus //a// tense/lax alternation is the weakest of all speakers, differentiation of formant patterns proceeds smoothly, showing neutralization, or lack of any laxity parameter.

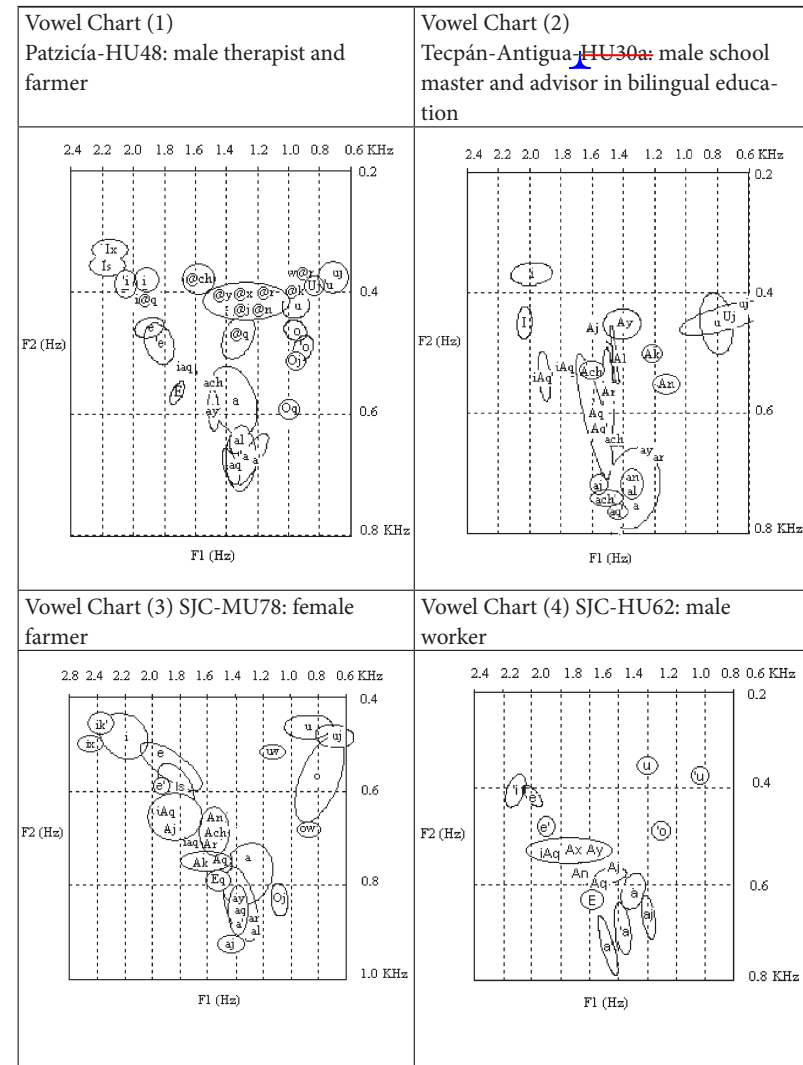
(23) F1-F4 (ä) phonotactic variation in a “neutral” dialect of Kaqchikel: Santiago Sacatepéquez (Santiago-MU19)

Santiago-MU19	F1	F2	F3	F4	Tokens
(bäl)	785	1690	2900	4025	2
(äl)	870	1780	3000	3845	3
(är)	780	1925	2760	4280	4
(äy)	675	2150	2905	4395	9
(äch)	760	2010	2840	4360	3
(äch')	805	1890	3015	4350	3
(äk)	820	1665	2880	4200	3
(äj)	790	1895	2980	4120	3
(äq)	795	1785	3010	4015	18
/ä/	785	1865	2920	4175	48
/a/	790	1740	2910	4035	48

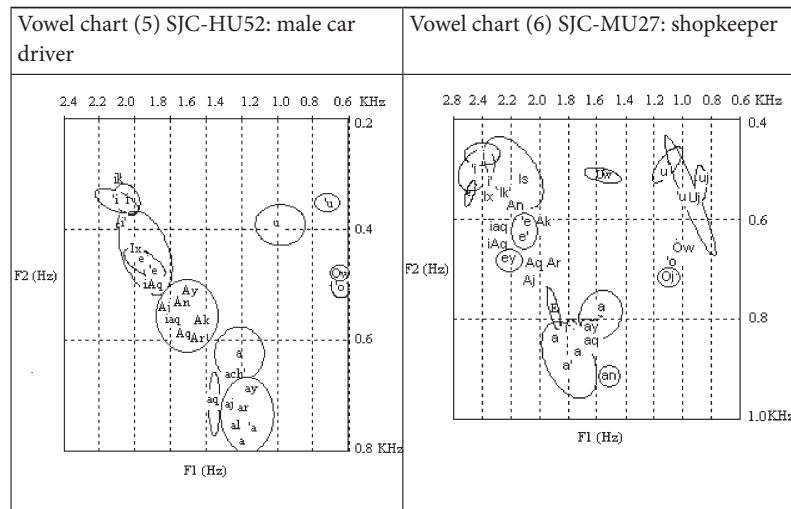
4.5 An overview: 6 vowel charts

Previous categorization of Kaqchikel dialects as Mid or High RTR, or –Low ATR type was grounded in (17), (18), (21), (22), (23) and also shows up in the vowel charts in (24) and (25). These results give evidence of the position held by each phoneme in the vowel space of the language as sketched previously in (12) and (14). The symbol @ stands for the +RTR raised (ä) reflexes of Patz-HU48. Other (ä) reflexes are annotated with <A>. 

(24) Vowel Charts 1-4: Four informants, three varieties



## (25) Vowel Charts 5-6: two informants, SJC (ATR/-Low type)

5. Some infraperceptive<sup>27</sup> properties of Kaqchikel TLVC

As vowel shifts have taken a strong hold upon the system, one would expect complete neutralization of duration in those modern dialects which developed substitutive parameters throughout a grammaticalized strategy. In other words, we saw that the TLVC of Quichean turned into sets of ATR and RTR constraints varying in the dialect network: a quantitative correlation of duration has become a qualitative opposition based on new markedness conditions. We should expect duration to have faded away under such circumstances, as it happened from Latin to Romance languages, which experimented with the same kind of process. However, a careful survey of segmental duration in our panel of 10 informants shows that some kind of quantitative opposition still lingers under the surface of the quantitative neutralization that is otherwise overwhelmed by qualitative grammaticalization.<sup>28</sup>

27. To be understood as “below the level of perception.”

28. See Léonard & Gendrot (2007) for a survey with Matlab of the details of length and formant shapes, showing the complexity of parameters involved in the Kaqchikel TLVC.

Mean duration in milliseconds, for such maximally syllabic nuclei as //a// and //aa// (i.e., /ä/ and /a/ in our encoding of underlying forms and (a), (‘a), (ä), (äPoss), (an), (ar), (al), (an), (ar), (al), etc. as sociolinguistic variables) follows a smoothly rising line of vowel length differentiation, upwards from unstressed (a) to stressed (‘a) (26).

## (26) Mean duration of low vowels in Kaqchikel: Four varieties, 10 informants

Variety type within the DS	Duration (milliseconds)	(a)	/ä/= //a//	/a/	/ä/ Poss. = //aa//	(‘a)
RTR Raising	Patz-HU-48	90	100	115	140	105
RTR Mid	Tecp-HU-30	80	95	100	120	125
[-Low, -ATR] Palatal	SJC-MU-78	120	125	140	170	130
	SJC-HU-62	80	90	120	150	125
	SJC-HU-52	75	110	100	110	120
	SJC-MU-27	80	135	135	150	165
	SJC-MU-25	125	125	140	135	160
	Xenim-HR-12	85	105	95	100	110
Xenim-MR-15	115	130	115	120	120	
Neutral	Sant-S-MU-19	70	85	135	105	180
All types	Mean	90	110	120	130	135

The number of tokens is given separately in (27), in order to simplify the tables and give the reader an idea of the size of our corpus.

## (27) Empirical evidence: number of tokens, by informant

	(a)	/ä/	/a/	(ä) Poss.	(‘a)
Patz-HU-48a	30	77	89	32	20
Tecp-HU-30	24	34	41	26	17
SJC-MU-78	24	33	51	22	5
SJC-HU-62	42	49	72	14	21
SJC-HU-52	30	17	42	11	12
SJC-MU-27	40	30	72	30	15
SJC-MU-25	15	40	38	17	6
Xenim-HR-12	8	28	21	15	5
Xenim-MR-15	40	59	60	23	20
Sant-S-MU-19	30	48	47	25	12
Mean	28	41	53	21	13

Duration is a handy parameter for cross-idiolect comparison since it does not depend on age or gender idiosyncrasies as formants do, which makes overall



comparison a matter of great caution in trying to find out correlations. A glance at the duration contrast in (26) suggests two things: (i) Duration contrast may coexist with the tense-lax contrast, as speakers of various ages, the two genders, and from two other sub-areas of the diasystem (the RTR-Variety and the Neutral RTR-Variety), all get along with redundancy patterns (quantitative contrast +RTR as in Patzicía, ATR-RTR contrast as in Xenimakín and SJC, or neutrality as in Santiago Sacatepéquez). (ii) The older the speaker, the stronger the feature, which amounts to saying that redundancy of quantitative and qualitative features might be a kind of elaborate parameter in the Quichean DS.

These results point to a hierarchy as in (28a), converted in (28b) into an indexical way that makes the data easier to read in our comments and in (28c) according to a correlative and oppositional approach.

- (28) A hierarchy of redundant duration contrast in Kaqchikel
- a. (a) 90 ms << /ä/ 110 ms << /a/ 120 << /ä/ Poss. 130 ms << (‘a) 135 ms
  - b. (a)<sup>90</sup> << /ä/ <sup>110</sup> << /a/ <sup>120</sup> << /ä/Poss <sup>130</sup> << (‘a) <sup>135</sup>
  - c. Unstressed V << Stressed V << Lax V *versus* Tense V << Lax V *versus* Tensed Lax V

Although each step does not exceed 20 ms (like unstressed (a) versus stressed (‘a)), the mean difference between //a// and //aa// stays close to 10 ms, though it may vary noticeably within and between idiolects.

Let’s now have a closer look at two columns: /ä/ = //a// on the one hand, and /ä/ Poss. on the other hand. The general trend of contrast between the two columns among the different speakers is quite high, coming close to a consensus (i.e., a grammatical consensus in the dialectal networks); e.g., the most RTR variety, Patz-HU-48, (a)<sup>100</sup> strongly contrasts with /ä/ Poss.<sup>140</sup>, to an amount of 40 ms. A 78 year-old female speaker from an ATR-(RTR) dialect of SJC, speaking a palatal V.Lax-dialect (SJC-MU-78), agrees with this; in this idiolect, values run at (ä)<sup>125</sup> and /ä/ Poss.<sup>170</sup>, therefore she invests no less than 45 ms on supporting grammaticalization of laxity (palatal laxity, in her case) through vowel length contrast. A 62 year-old craftsman from the same town (SJC-HU-62) invests even more in the bargain, with (ä)<sup>90</sup> and /ä/ Poss.<sup>150</sup>: a difference of no less than 60 ms. This drives his (ä) close to the total duration of an unstressed (a) in his own speech (80 ms). By contrast, a local driver (SJC-HU-52), does not count on duration contrast; he simply does not seem to care: (a)<sup>110</sup> = /ä/ Poss.<sup>110</sup>. Young women in SJC (SJC-MU-27 and SJC-MU-25) still cling mildly to the duration contrast, with (ä)<sup>135</sup> versus /ä/ Poss.<sup>150</sup> and (ä)<sup>125</sup> versus /ä/ Poss.<sup>135</sup> respectively.

We shall now turn to three columns: tense and stressed (‘a), possessed stressed (ä) in nouns, i.e., (ä)Poss., and unpossessed stressed lax low vowel /ä/. The high score of (ä)Poss., close even to (‘a), the longest nuclei of all, suggests

that the lexical inputs in (9) above (/kar// > kär, //nukaar// > nukar, //xal// > jäl, //nuxaal// > nujal, etc.) are grounded on empirical evidence. A covert duration contrast is thus competing with (or rather associated with) qualitative parameters in the DS, such as RTR, ATR-RTR, and Neutral. We can even dare say that to a certain extent, the former quantitative opposition has found in the possessive noun correlation a grammatical sanctuary to keep a toe in the system of nuclei in Kaqchikel. While neighboring linguemes of the Quichean diasystem, such as Tz’utujil, Achi, or Poqom, still maintain the Proto-Mayan vowel length opposition, Kaqchikel can be classified as a mixed type with respect to duration contrast and RTR/ATR/Neutral parameters, which both merge in a redundancy strategy. Empirical data in (26) shows evidence that (ä)Poss. nuclei are encoded as long vowels by the grammar, whereas /ä/ nuclei are much shorter; in the same way they are also qualitatively quite different through RTR–ATR sets of properties, except in the neutral type of Santiago Sacatepéquez. A hierarchy of redundant features is kept busy playing cards, **variable** alternating the pressure of constraints around the gambling table of the diasystem (DS) between players, according to the rules of the game displayed in (29).

## 6. After rainfall upon lava in the core of the diasystem

We started doing fieldwork on Kaqchikel TLVC with the idea that we might grasp covariationist shifts of the Labovian type in local norms or DS varieties, since we had good reason to suppose that Guatemalan Amerindian societies are stratified; they are highly urbanized with a wide array of occupational opportunities, in spite of rampant socioeconomic segregation. But in the first place, we had to consider that, since a written norm endowed with prestige and wide functionality is still missing to provide a normative model,<sup>29</sup> there is not sufficient Fergusonian diglossia yet in Kaqchikel nor in K’iche’ to search for inner covariation.<sup>30</sup> On the contrary, we observed variation through a different perspective; throughout the diasystem, speakers are working hard at coping with subtle grammatical patterns

29. A functional standard does exist, thanks to OKMA, the ALMG, and other institutions working on applied Amerindian linguistics in the country, with concrete descriptive and prescriptive achievements.

30. Besides, we consider that the effect of Fishmanian diglossia (Kaqchikel versus Spanish) is probably null upon TLVC in the Amerindian language at stake; the phenomenon is totally alien to Spanish phonology and grammar, and the degrees of bilingualism observed in our informants were kept sufficiently separate in the speakers’ linguistic repertoire to ensure structural autonomy of the speech forms produced.

combined with a multiplex set of phonological constraints. Functional factors still depend on universal laws for the elaboration and use of human artifacts.

In other words, optimal coarticulatory gestures, control of phonemic category commands, and personal style of speech all interfere in the framing of any idiolect representative of a local, ethno-cultural means of communication, as we observed here in Kaqchikel. This device, or artifact – however one calls it – that speakers work hard at making constantly functional, contributing to optimizing its typological expression for separation or interaction, is the dialect variety itself: the dialect as a member of the diasystem.

In (14) we listed four types in the Kaqchikel diasystem: (a) V-RTR Raising, as in Patzicía (HU48), (b) V-RTR Mid, as in Tecpán (HU30), (c) V-ATR Fronting /-Low, as in San Juan Comalapa and Xenimakin, (d) Neutral, slightly ATR/-Low, as in Santiago Sacatepéquez. We shall conclude that trends towards local unification in every urban center of the Kaqchikel area are as strong as those observed in urban and rural Comalapa, not giving much chance to covariation. But in spite of impressionistic allegations for the existence of various types of vowel systems (recall (5)),<sup>31</sup> the basic vowel shift in process in Kaqchikel is laid out in (29) and (30):

- (29) The TLVC rules of the redundancy game
- a. Convert the vowel length correlation of Proto-Mayan into a tense/lax contrast alternation embedded in lexical categories implementing the correlational shift in the grammar and in the lexicon of roots and affixes, cf. (8).
  - b. Infuse vowel laxity features such as RTR (in Tecpán, Patzicía and the vowel *centralising* varieties), ATR (in SJC) or neutral low merging (in Santiago Sacatepéquez) throughout the diasystem.
  - c. Keep some kind of duration contrast between (ä) and (ä)Poss. as much as possible in the diasystem.
- (30) *The Kaqchikel TLVC vowel-shift*
- a. High short/lax vowels become -ATR ( $i > ī$ ;  $u > ū$ ).
  - b. Mid-vowels, if short/lax, are lowered, and therefore [-ATR] ( $e > \varepsilon$ ;  $o > \circ$ ).
  - c. Low short/lax vowel raising, with RTR or palatal raising ( $a > \text{ɹ}$  [+RTR];  $a > \varepsilon$ ,  $e$  [-ATR]).

31. Our intention here is not to criticize the outstanding work achieved by OKMA and our colleagues from the ALMG who have done their very best to describe lax vowel allophony in Kaqchikel and K'iche'. Their descriptive work is still valuable and trustworthy, as they were native speakers and well-trained linguists. We only point out that no phonetic transcription relying exclusively on the linguist's perception can be properly accurate (cf. Ladefoged 1975: 50–142).

In fact, the TLVC surveyed in this contribution is as simple as that; taking the right side of our binoculars to get a closer look at empirical and experimental data, we had a chance to get to this conclusion. Some tiny clues helped us a great deal. The ATR parameter in Comalapa stemmed from noticing how high and tense (therefore, +ATR) the Kaqchikel //ee//, i.e. /e/, appeared in vowel charts. We also noticed with much interest that //e//, i.e. <ë>, and //o//, i.e. <ö>, systematically lowered in all SJC speakers, becoming [-ATR], which amounts to a chain of [-ATR] application on phonemic categories: //i// > /i/, //u// > /u/, //e// > /e/, //o// > /ɔ/, while /ä/ in SJC regularly raised to reach an intermediate position between <e> and <ë> in the vocalic space.

As Patzicía and Tecpán clearly followed a similar trail for high and mid vowels, though relying more on RTR than ATR gesture, and differed mainly in the levels of RTR raising of /ä/, we wanted to see if the outrageously prolific annotation of lax vowels in available descriptions of Kaqchikel (cf. (4)) could be simplified. If there was a way to understand how allophonic dispersion of sonority (F1) and chromatic properties (F2, with perhaps redundant support of F3 and F4) worked, we could hope to get a much simplified overall picture. We discovered that syllabic integration of the onset and the coda did have an important role to play in conditioning the variability of reflexes, and quantified acoustic data reliably showed that this variation was easily predictable on the basis of homorganic or heterorganic place markedness conditions in the language.

The linguistic community in San Juan Comalapa did not prove stratified nor to be competing with stereotypes, markers, or any variable of a stratificational type in their native language.<sup>32</sup> Instead, a quantitative sociolinguistic approach to the grammatical or structural correlates of geolinguistic, typological, and stylistic variation opened the windows wide onto an unexpected set of parameters in the core of the diasystem: how an Amerindian language, or at least a non-Indo-European language of a specific type, handles semiotic balance and feature redundancy in a structural correlation (i.e. the TLVC).

Moreover, we have attempted here to grasp so-called “lax vowels” in a Quichean language empirically, relying on acoustic analysis, instead of hand notation as generally done in the available literature on these languages. This led us to address a major challenge for quantitative (socio)linguistics applied to Amerindian

32. As already suggested, conditions of segregation on a Fishmanian diglossic basis with Spanish overcome conditions of Fergusonian diglossia between varieties of Kaqchikel and standard Kaqchikel, which does exist, but still struggles to gain more functional space and status in modern Guatemalan society. The type of stratification at work in New York City (e.g., Labov 1966) cannot be simplistically compared to the current and historical segregative policies in a rural country like Guatemala.

languages; most of the data available is still unfit, impressionistically written up, and we might say that the very structure of variables is still unclear. For instance, the TLVC in Kaqchikel turned out to be much more complex than a mere tense-lax vowel contrast. We had to take into account intricate patterns of duration contrasts to realize that the VLC (Vowel Length Correlation), its former matrix inherited from Proto-Mayan, was still somewhat active in the system. We had to enter into the intricacies of contextual variation, i.e., the properties of the coda, and its **licence** to palatalize velar onsets in the case of uvular codas. We had to disentangle the whole array of morphological paradigms conditioning “laxity” in short nuclei, as in (8). We realized that “laxing” would be more or less grammaticalized or lexicalized throughout the 14 paradigms enclosed in the table. Nevertheless, we saw that male and female speakers of various crafts and professions and various levels of education would behave quite homogeneously within the framework of the local norm, as in San Juan Comalapa.

But there is still more to say about the consequences of the diasystemic TLVC and vowel shifts in a Minor Quichean language such as Kaqchikel. The TLVC probably started in ancient times, in pre-Columbian Mesoamerica. Summed up in a few words, our results point to very long historical continuity of phonological variables accounting for geolinguistic variation in each language and dialect continuum, rather than to recent dialect fragmentation and stratification in scattered communities.

In spite of internal wars between Mayan kingdoms, genocide and political disintegration from the *Conquista*, *reducciones*, and scattering over the country or migrating abroad, and in spite of wars waged by the postcolonial and national armies in later centuries, earthquakes erasing small towns of the size of San Juan Comalapa (see Section 1.3.), highland Mayan social and dialect networks still firmly hold on and experience linguistic changes such as those scrutinized here (vowel shifts, the structural conversion of the VLC from the Proto-Mayan period into the TLVC in modern K'iche' and Kaqchikel varieties) out of long-term historical continuity.

Though Kaqchikel, as well as K'iche' or Mam, are now well-described by current descriptive and applied Mayan linguistics, the phonetics and Labovian sociolinguistics of Mayan languages still await further work. Committed with great care to empirical data, Labovian methodology has a lot to say, beyond the quest for understanding stratification or psycho-social variation, to Mayanists, archaeologists, linguists, and bilingual school teachers. The quantitative phonetic study we attempted to report on here, according to basic principles of phonology and inflectional morphology, reaches the conclusion that the apparently intricate system of TLVC can be described simply, and that its complexity probably lies below the level of perception as a bundle of both segmental and prosodic redundant

features. From an articulatory and category perception viewpoint, the diasystemic constraints and basic laws of the TLVC vowel shift are actually quite simple, as mentioned in (13), (29) and (30).

Lava, like maize, has only four colors deep inside the core of the volcano.

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## CHAPTER 8

## Phonological features of attrition

## The shift from Catalan to Spanish in Alicante

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This paper examines phonological attrition from a variationist viewpoint in an urban speech community where the target language is a marginalized one. This language is Catalan, the major speaking area of which is dominated by Spanish. Fieldwork is based on a sample of 69 subjects representing the small number of speakers born in the city who ~~learn~~ Catalan by engaging in natural meaningful communication. In the past, the phonological level of the grammar had remained the most faithful to the Catalan heritage in local speech. Recently, however, this component of grammar has become the most affected by attrition, as shown in the vocalic and consonantal systems, which are now converging from Catalan to Spanish.

## Introduction

Dressler (1972) and Dorian (1973) were responsible for initiating discussion of *language death*, and since then studies about it have multiplied. The two main perspectives which inform these studies are social status and linguistic structures (Dorian 1989). It is this latter approach which concerns us in the present study, and it involves analysis of the disintegration or *attrition* of the structures of a recessive language (Andersen 1982). An additional theoretical distinction must be made among studies focusing on linguistic structures, as the term attrition is applied as well to aphasic research (Seliger & Vago 1991).<sup>1</sup> However, it is not the individual's health which concerns us here, but the health of the language in a minority situation. This “language disease” occurs in multilingual speech communities where a failure to transmit the former speakers' first language (L1) between consecutive generations gives rise to a new class of speakers with low proficiency

1. There is another trend in the study of attrition: the oblivion of languages explicitly ~~learn~~ (Lambert 1989; Ellis 1994).