On the external relations of Purepecha : an investigation into classification, contact and patterns of word formation

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2. CLASSIFICATION ATTEMPTS[39]

"Gangrene? You think I might get gangrene?"
"Yeah."
"Hey, that might work! Green with apricot - I think I could pull that off!"
(Cat to Lister, 'Dimension Jump')

Abstract

The position of Purepecha in both Mesoamerican and pan-American language classifications has long interested linguists. While many studies converge upon isolate status, two classifications in particular (Swadesh, 1967; Greenberg, 1987) offer weak support for distant external relations. Swadesh's proposal also emerges in several archaeology studies (e.g. Hosler, 1994; Anawalt, 1992) as evidence for contact between peoples of South America and Mesoamerica. Given this cross-disciplinary interest, coupled with the limited and poor quality data used in previous studies, in this chapter I re-visit the genealogical position of Purepecha. In part one I consider lexical similarities, applying the Monte Carlo variant of Oswalt's (1970) Shift Test (Dunn & Terrill, 2012) to phonologically standardised datasets. This test fails to detect a signal of relatedness between Purepecha and any other language in the sample, indicating that the 'cognates' identified in previous studies represent no greater similarity than would be expected due to chance. In part two I focus on the structural similarities evident in the verbal morphology of Purepecha and Quechua, contextualising them within known patterns of affix ordering in strongly suffixing languages in the Americas and beyond. The ordering similarities encountered here echo the findings of earlier studies related to the relative ordering of morphemes (Bybee, 1985; Foley & Van Valin, 1984) and the preference for suffixing from both synchronic and diachronic perspectives (e.g. Cutler, Hawkins & Gilligan, 1985). The evidence from parts 1 and 2 thus converges on the same result: the two main classificatory proposals for Purepecha are baseless and should be rejected once and for all. I recommend focusing instead on language-internal processes of

[39] This chapter constitutes a slightly adapted version of Bellamy, Kate & Michael Dunn. In prep. Two methods for assessing the classification proposals of Purepecha.

grammaticalisation and change in order to advance our understanding of the evolution of agglutinating languages, one language at a time.

2.1. Introduction

Spoken by around 125,000 people (INEGI 2010) in the state of Michoacán, centre-west Mexico, Purepecha is a wholly suffixing, agglutinative language, characterised by its rich, productive verbal morphology and extensive set of locative morphemes. Word formation, for the two major word classes of nouns and verbs, proceeds from a mono- or disyllabic stem that is usually supplemented with derivational morphology of up to seven or eight functional morphemes, although the average for verbs is generally between four and six (Friedrich, 1984). At the clausal level the language is nominative-accusative and displays a preference for dependent marking, whilst also possessing a number of head-marking characteristics (Chamoreau, in press). Constituent order in the studied varieties is generally SVO although it is claimed that the language has shifted from SOV through prolonged contact with other SVO languages, predominantly Nahuatl and later Spanish (Chamoreau, 2012). Variation in constituent order can still be observed, however, and much work remains to be conducted on dialect variation in this domain (Chamoreau, in press).

Generally Purepecha is classified as a language isolate (Campbell 2014, 1997; Kaufman 2007) although a number of other, more or less controversial, classifications have also been proposed (see Section 2). Two major classifications merit more detailed discussion: first, Swadesh (1967, 1956) linked Purepecha to Quechua in South America and Zuni in the southwest USA. Second, in Greenberg's (1987) overarching Amerind language family, Purepecha is grouped in the Chibchan branch of the Chibchan-Paezan sub-family alongside 15 other languages from Mesoamerica, Central America and northern South America. Swadesh's proposal in particular continues to hold some weight in linguistics (see Sánchez-Díaz, 1999) as well as in other disciplines that also deal with the prehistory of the Americas, notably archaeology (see especially Anawalt, 1992).

Not only a genealogical outlier in Mesoamerica, the position of Purepecha in the Mesoamerican linguistic area is also peripheral, bordering on external

(Chamoreau, in press; see also Chapter 4). It exhibits very few of the signature characteristics of the Sprachbund that are present in many other languages, such as semantic calques, relational nouns and nominal possession of the type 'his-X the X' (Campbell, Kaufman & Smith-Stark, 1986; Smith-Stark, 1994). Overall, then, its less common morphosyntactic features, coupled with the small number of shared Sprachbund traits, set Purepecha apart from other Mesoamerican languages. As such its genealogical and areal position continues to be of interest to historical linguists and typologists alike.

In this paper I focus on testing the classification proposals put forward by Swadesh and Greenberg, which are often criticised or dismissed, but have not been expanded or updated (McClaran 1977, Campbell 1997). I do this in two ways. In the first part of the paper I focus on the lexicon, applying an updated version of the Oswalt's Shift Test (Oswalt 1970) to phonologically standardised basic vocabulary data for languages in the two classification proposals, in order to explore whether the similarities identified are in fact statistically any better than chance (following Dunn & Terrill, 2012). In short, there is no lexical support for the relationships posited. Given that structural features have been claimed to be more diachronically stable than the lexicon (Dunn et al., 2008), in the second part of this paper I investigate whether the similarities evident between Purepecha and Quechua in their wholly suffixing verbal morphology could be indicative of a more ancient relationship of either inheritance or convergence. I compare the ordering and degree of compositionality of the verbal suffixes in Purepecha and Quechua, identifying key similarities and differences. I then contextualise these patterns within a wider typological sample of 25 predominantly or wholly suffixing languages from the Americas and Eurasia. The results of this small-scale typological study demonstrate that both the shared suffixing preference and the relative ordering of verbal suffixes, as well as the differences in compositionality, can largely be accounted for by existing cognitive and semantic models of affix ordering (e.g. Rice, 2011; Bybee, 1985; Foley & Van Valin, 1984). These similarities therefore seem to be the result of the more restricted design space of structural features, coupled with processing and/or diachronic preferences for

suffixing (e.g. Cutler et al., 1985; Hall, 1988) rather than being indicative of a relationship of inheritance or convergence.

This paper is structured as follows: In Section 2.2 I provide an overview of previous classification attempts of Purepecha from the mid-nineteenth century to the present day, paying particular attention to the lexical comparisons advanced in the proposals of Swadesh (1967) and Greenberg (1987), as well as the lesser-known but equally unconvincing study of Belmar (1910). In Section 2.3 I outline the state-of-the-art of quantitative methods for automated cognate judgement, focussing on the Monte Carlo variant of the Oswalt Shift test that I apply to the expanded wordlists for the languages presented in Section 2.2. I present the results of this test in Section 2.4. In Section 2.5 I turn to structural features, presenting the respective verbal suffixing systems of Purepecha and Quechua, comparing them qualitatively with a typological sample of 25 languages. In Section 2.6 I offer some concluding remarks and suggestions for further research.

2.2. Previous classification attempts

The genealogical affiliation of Purepecha has been the subject of scholarly attention since the mid-nineteenth century when, in 1864, the renowned Mexican historian Manuel Orozco y Berra claimed - with great foresight - that the language was an isolate (Arana de Swadesh, 1975). This classification was reiterated in the first half of the twentieth century by many equally well respected scholars from both North America and Europe (Léon, 1903; Belmar, 1905; Meillet & Cohen, 1924; Sapir, 1929; Hoijer et al., 1940; Alden Mason, 1940; Brinton, 1946; all presented in Arana de Swadesh, 1975), with only Jiménez Moreno preferring the more conservative label "unclassified". During this hundred-year period the only exceptions to the 'isolationist' position were the remarkably named Charles-Félix-Hyacinthe Gouhier, *comte de Charencey* and the aforementioned Francisco Belmar. De Charencey claimed Purepecha to be connected to the extinct Otopamean language Pirinda (also known as Matlaltzinca), Mixtec (also Otomanguean), and Totonac (Totonacan; de Charencey, 1883). Belmar, contradicting his own 1905 proposal, first suggested a relationship with languages in what he called the Mixtec-Zapotec-Otomí family

(Belmar, 1910), then later only with what he called Zapotec, in reality a dialect of Matlaltzinca, echoing de Charencey's proposal (Belmar, 2011 [1921]).

Belmar (1910) offers 91 supposed cognates (listed in Appendix A) in total, distributed between Purepecha and Amuzgo (68), Purepecha and Cuicateco (57), Purepecha and Popoloca (26), and Purepecha and Trique (3). Of these cognate candidates, only one is shared between Purepecha and all four languages, while just four are shared between Purepecha and all the languages except Trique. Amongst the 26 shared terms between Purepecha, Cuicateco and Amuzgo, we find basic vocabulary such as 'to wipe' and 'to walk', as well as cultural terms such as 'deer', 'wild boar', 'cherry', and 'witch'. Belmar groups his 'cognate' sets according to phonetic elements, such as the dental stops /t/ and /d/, the velar stop /k/ and its allophones, and sibilants (Belmar, 1910: 619-623). However the single prerequisite for inclusion in such a set appears to be that the element in question is merely present, irrespective of its relative position in the word. Examples include Purepecha *etzi* ~ Amuzgo *dateya* 'water', supposedly indicative of the /t/ and /d/ reflexes, or *erakata* ~ *yaku* 'tall, high' for the /k/ reflexes. Belmar claims that these roots were "not shared due to the vagaries of commerce or politics between peoples (i.e. loans), […] but rather permit the scientific deduction that Purepecha is not an independent language" (Belmar, 1910: 623, my translation).

It is not clear how the cognate candidates were identified, although it is likely that their inclusion is the result of an inspectional analysis of dictionaries or other wordlists, the quality of which can also be questioned. For example, Belmar mistakenly links Purepecha *xanu* to the Cuicatec *chanu* 'wild boar' (Belmar, 1910: 623). While the Purepecha form is correct, the Cuicatec form lacks the tones characteristic of so many Otomanguean languages, not to mention the first word in the compound, viz. *cu^{1}chche^{4}nu^{3}* 'wild boar' from *cu^{2}chi^{1}* 'pig', a loan from the Spanish *cochino* 'hog, pig, boar', and *che^{4}nu^{3}* 'mountain, field' (Anderson, 1983). He also fails to identify Purepecha *mitzitu* and Popoloca *kumistu* as clear examples of the pan-Mesoamericanism term for 'domestic cat', which most likely originates from the

Classical Nahuatl *mizto(n)* (Brown, 2011: 183; see also Section 4.3.2).[40] Nonetheless the total proportion of cognate candidates offered by Belmar for Purepecha-Cuicateco-Amuzgo is very similar to that offered by Swadesh for his Purepecha-Quechua link, hovering around one quarter (see Section 2.1).

The second half of the twentieth century saw continued attempts at classifying Purepecha, still within the wider context of reaching a clearer classification of the languages of Mexico, as well as of the Americas more widely. A particularly remarkable classification that deserves a mention for its sheer creativity and improbability is Contreras (1985), in which he compiles a book-length set of allegedly systematic correspondences between Purepecha and Sanskrit! Nonetheless, while many scholars followed in the footsteps of their predecessors by labelling Purepecha an isolate (e.g. McQuown, 1955, 1956; Greenberg, 1956; Tax, 1960; Longacre, 1967; Hoijer, 1969; all cited in Arana de Swadesh, 1975; Kaufman, 1974, 1977; Landar, 1977; McClaran, 1977; Suárez, 1983; Campbell, Kaufman & Smith-Stark, 1986; Campbell, 1997, 2016), two notable alternative classifications also emerged. I turn to these proposals in Sections 2.2.1 and 2.2.2.

2.2.1. Swadesh's proposals

Morris Swadesh included Purepecha in his Macro-Penutian grouping (Swadesh, 1956), together with 19 other languages or language groups in the Americas stretching from the Coosan languages of Oregon in the north to the Andean language families Quechuan and Aymaran in the south. Swadesh used two shared structural features to build on Kroeber and Dixon's (1919; cited in Swadesh, 1956: 19) lexical proposals. The first feature is vocalic and/or consonant alternation in augmentative-diminutive symbolism, whereby a high vowel /u/ or /i/ in the diminutive or terms for 'small', such as Tsimshi-Nisga *łkuc'usk*, Chinook *-nukstx*, contrasts with a low vowel /a/ for words

[40] Note that the other, phonologically similar, forms for "cat" that are found in languages across Meso- and South America, such as Yaqui *miisi*, Mazahua *misi*, Cuna *mis*, Cofan *mishi*, Chiriguano *michi*, and Quechua */misi/ or /miši/,* derive instead from Hispanic 'cat' terms based on the Latin morpheme *mi*, which are no longer heard in Latin American Spanish (Brown, 2011: 183). However, in Dietrich (1986), the principal entry for 'cat' in Chiriguano is *mĩta*, which coincides with the word for 'child' (see also Guaraní *mitã́*). The latter author does not mention *miči*, except in the meaning 'small'. It is unclear where Brown (2011) gathered his data for this language.

expressing augmentatives and concepts of largeness or thickness, such as Coatec *mapʃ* 'thick'. The second feature is reduplication for concepts of iteration, intensity, plurality, dispersion or continuative extension, e.g. 'round': Klamath *kalkal*, Santiam *wilwil-uu*, Tzoltil *wolwol*, Purepecha *wiríwirisɨ* (Swadesh, 1956: 27). Notably, none of these features is shared across the whole proposed family; moreover reduplication is a common phenomenon cross-linguistically, not only in the Americas. Furthermore the small number of purported shared morphosyntactic features does not lend itself to a strong argument for genealogical unity.

The final three languages in the Macro-Penutian grouping – Quechumaran (i.e. Quechuan and Aymaran), Tarasco (i.e. Purepecha) and Zuni (see Swadesh, 1956: 21) – recur in some of Swadesh's later work.[41] Swadesh (1957) presents possible cognates in kinship terms between Purepecha and Zuni, supplemented with similar forms from other language families, largely in Mesoamerica and North America. Given that all of the possible cognates display reflexes in other language families, they cannot be indicative of a relationship between Purepecha and Zuni only, but suggest patterns of areal diffusion, ancient relatedness, coincidence, and/or convergence based on phonological commonalities in child language.

In one of his later studies[42], Swadesh (1967) connects Purepecha again with Zuni, but also more closely with Quechuan, although it is not clear which variety or varieties of Quechua he used, on the basis of shared basic vocabulary. These cognate candidates are presented in Table 10.

[41] It is of passing note that all four languages are generally considered isolates or isolated families, although the relationship between Quechuan and Aymaran has always been less clear due to centuries of intense interaction (but see Emlen, 2017 for a new perspective on the prehistoric Quechua-Aymara contact relationship).

[42] Swadesh (1966) also links Purepecha with Mayan languages, but this proposal is even more outlandish due to its inclusion of (i) clear loans, e.g. Tarascan *tu-pu* / Maya *tuch* 'navel' < Nahuatl *tos 'navel', also borrowed by several other languages in the area and Tarascan *šan-tu* 'to make adobe' / Maya *šan* 'adobe' < Nahuatl *-son* 'adobe', (ii) excessively loose semantic alignments, including 'tooth' ~ 'firewood' and 'corner' ~ 'nipple', and (iii) cases of onomatopoeia, including Purepecha *thiwa-* and Mayan *tub* both 'to spit' (Campbell, 1997: 224-226; 324). To the latter set, Willem Adelaar (pers. comm.) also adds Quechua /*tuqa-*/ 'to spit' although the root *tu in proto-Quechua is defined as 'stick, to stick, poke, puncture' (Emlen, under review), somewhat further away semantically. Given the unconvincing nature of these so-called cognate sets I will not discuss the proposal any further in this paper. I refer the interested reader instead to Swadesh (1966) and Campbell (1997) for the full dataset and evaluation respectively.

Meaning	Purepecha	Quechua	Zuni
what	emáŋka	ima	
no	ámpi	mana	
many	kani-	as-kha	
woman	walí	war-mi	
root	sɨráŋka	saphi	lak^{w}imo-
small	sapí	hu-č^{ʔ}u	¢^{ʔ}a-
skin	si-k^{w}íri	qara	¢^{ʔ}ikk^{w}a
blood	yulí-ri	yawar	
grease	tepári	tika	
horn	si-waŋk^{w}a	waqra	
tail	chéti	cupa	
feather	phuŋk^{w}ári	pura	
mouth	pen-čumi	simi	
tongue	katámpa	qalu	honni
teat	i¢u-	k^{ʔ}in-ču	
die	wáli-	wañu-	
kill	wán-ti-ku-	wañu-ci	
come	hula-	hamu-	^{ʔ}i-
say	alí-	ni-	
moon	kukála	kila	
star	hós-k^{w}a	quylur	
hot	holé-	q^{ʔ}uñi	k^{ʔ}ałi
burn	kulí-	kana-	k^{ʔ}usa ‘dry’
road	šaŋá-ru-	ñañ (*šñañ)	^{ʔ}ona-
white	urá-	yura	
night	cúri-	tuta	tehłi-
cold	¢ira-	ciri[43]	te¢^{ʔ}e

Table 10: Quechua-Purepecha-Zuni cognate candidates (from Swadesh, 1967: 93)

Even the briefest of glances at Table 10 is sufficient to note the lack of systematic phonological correspondences between the languages (see also Campbell, 1997: 224-226, 325-326). Take word-initial /s/ as an example: in *sɨráŋka ~ saphi* ‘root’, *sapí ~ hu-č^{ʔ}u* ‘small’, and *si-kwíri ~ qara* ‘skin’ the Quechua terms begin with three different phonemes - /s/, /h/, /q/ - in contrast to the one Purepecha spirant /s/. At best, then, what we are dealing with here is a list of possible lookalikes (viz. *¢ira-~ciri* ‘cold’ for a reasonable example), loans, and/or onomatopoeic or sound symbolic terms, none of

[43] Note that the form *ciri* is predictably found in depalatalizing dialects (mainly Ancash Quechua), while the rest of the dialects have *čiri* (Willem Adelaar, pers. comm.).

which meet the stringent comparative standards that Swadesh himself lays out in previous works (Swadesh, 1954b: 313).

Liedtke (1997) offers a critical analysis of Swadesh (1967), highlighting the various inaccuracies in morphological segmentation, orthography and semantics for both Purepecha and Quechua, concluding that only two correspondences are plausible, namely *emanka ~ima* 'what, which, thing' and *čira ~ cira* 'cold'.[44] Yet despite the fact that "these two presumable agreements […] by themselves do not suggest any kind of historical relationship" (Liedtke, 1997: 75), he still pursues the possibility of a linguistic relationship by proceeding to offer a new set of 65 cognate candidates between numerous Quechuan and Aymaran languages and Purepecha (see Appendix B for the full set of correspondences). Some of these correspondences may appear at first sight to be more suggestive of a relationship than those in Swadesh (1967), such as the entry for the Purepecha terms *pure-* 'to go somewhere' (my translation) and *phure-/phore-* 'go visiting' alongside the following proposed reflexes: SPC (a variety of Tarma Quechua) *puri-š* 'gadabout, ambulatory', *puri-kuna* 'road, path'; Ayacucho Quechua *puri-* 'to walk, travel, walk through, wander, roam'; Ancash Quechua *puri-* 'idem.'; Huaylas Quechua *puri-* 'to run'; Ecuadorian Quechua *puri-* 'idem.'; Bolivian Quechua *puri-* 'to walk, travel, walk through, wander, roam'; Tarma Quechua *puri* 'to walk (about)'; Junin-Huanca Quechua *puli-* 'to go'. On the surface, this looks like a fairly neat set of correspondences both phonologically and semantically. An insurmountable barrier to its acceptance appears, however, when it emerges that the Purepecha lexeme is completely incorrect and untraceable in any reliable source (e.g. Lathrop, 2007 [1973]; Velásquez Gallardo, 1978; Friedrich, 1971). Indeed it is unclear where Liedtke found this entry, despite claiming he consulted the three sources just mentioned, amongst others.

Moreover, the majority of the proposed cognate sets possess reflexes in just one or two of the 13 Quechuan and Aymaran languages, and many sets possess quite

[44] Other inaccuracies, such as Quechua *cupa* instead of the correct *čupa* 'tail' and *kʾin-ču* in place of the correct *ɲuŋu* (W. Adelaar, p.c.), are not mentioned by Liedtke (1997) but lend further support to the argument that the set of correspondences is highly insufficient for establishing a relationship between the two languages. In the interests of space and not repeating previous discussions, I will not list all the inaccuracies here but instead refer the interested reader to Liedtke's (1997: 72-75) discussion and lexical sources therein.

stretched semantics (see, for example, Purepecha *khunču-* 'to be crooked, twisted' and Ayacucho Quechua *uñču-* 'to contract the limbs, squat awkwardly'), thereby further weakening the relatedness argument (see Section 2.2 for a similar criticism of Greenberg's (1987) classification). In sum, then, Liedtke's (1997) proposal suffers from similar shortcomings to Swadesh (1967), namely poor data and a lack of consistency, the very same issues the former cites as being problematic in the latter's work (Liedtke, 1997: 72-75).

Such a flexible approach to cognate candidate identification is reminiscent of the work of Belmar (1910), published many years earlier, as presented in Section 2.2; none of the authors defines what constitutes a lexical similarity, normally a prerequisite for establishing cognates (see Swadesh, 1954: 315).[45] However, of the 100 basic vocabulary meanings used to identify potential cognates (what we would now call the Swadesh 100 list), Swadesh claims that around a quarter are shared by Quechua and Purepecha and that the proportion of three-way agreement is 7%. This figure is roughly what would be expected, according to proponents of lexicostatistics (such as Swadesh himself) for a deep-time relationship, which is set at 45 minimum centuries (Swadesh: 1967: 92-93; see Section 2.3.1). Indeed Swadesh favoured quality of cognates over quantity, claiming that "[t]he important thing is not so much the number of examples as their phonologic consistency" (Swadesh, 1954: 319), even if the quality of the cognate candidates assembled above is far from consistent.

While he resoundingly dismisses any possibility of a relationship between Purepecha and Quechua, Campbell (1997: 325) also notes that "[i]t would not be significant enough to mention here except that the notion has been cited with some frequency in archaeological papers dealing with possible contacts involving metallurgy between the Andes and western Mexico". The idea that Quechua and Purepecha could be linked due to prehistoric maritime interaction between peoples in the areas where these languages (amongst others) are spoken has been proposed by a number of predominantly diffusionist archaeologists. As evidence for this interaction

[45] In previous work (e.g. Swadesh, 1954), Swadesh indicates that a CVC agreement between two segments in two separate languages is necessary for proof of relatedness. These terms should relate to non-cultural vocabulary and not be loans or sound symbolic/sound-imitative. He seems to ignore his own standards in Swadesh (1967), as amply demonstrated in Table 10.

they cite different types of similarities in material culture, namely weaving techniques and clothing styles (Anawalt, 1992), death rituals and funerary offerings (Albiez-Wieck, 2011: 405), ceramic styles (Coe & Koontz, 2008: 48), trade in *Spondlyus princeps* (Marcos, 1977/78) and, most notably, metallurgical techniques and objects, including axe monies (Hosler, 2009, 1994; Hosler, Lechtman & Holm, 1990).

That said, Bellamy (in press) finds no positive evidence of borrowing in the lexicon of metallurgy that would support a long-distance contact scenario, but also concedes that the lack of linguistic evidence may reflect the nature of technology transmission rather than the complete absence of interaction between the two regions. In contrast, Brucato et al. (2015) identify a small, but significant, Andean component in the genome of four Mesoamerican groups that are known to have practiced metalworking in prehispanic times, including – most importantly for our purposes - the Purepecha. Taken together, these studies offer suggestive, but as yet chronologically undefined, support for some kind of interaction, but more likely in terms of contact rather than relatedness (see also Chapter 3 for a more detailed discussion of the evidence for the proposed long-distance interaction).

2.2.2. Greenberg's classification

No discussion of a language classification proposal in the Americas would be complete without reference to Greenberg (1987). In his now (in)famous three-way classification of languages in the Americas into Eskimo-Aleut, Na-Dene, and Amerind, Greenberg assigns Purepecha to the Chibchan half of the Chibchan-Paezan sub-group of Amerind, alongside Antioquia, Aruak, Chibcha, Cuitlatec, Cuna, Guaymi, Lenca, Malibu, Misumalpan, Motilon, Paya, Rama, Talamanca, Xinca and Yanoama. Numerous critiques of his classification have been published, drawing attention to the poor quality of the data as well as to the loose nature of his qualitative 'multilateral comparison' method, which involves equating words with different meanings, sometimes using only segments of certain words (e.g. Adelaar, 1989; Campbell, 1988; see also Greenberg, 1989). Given these issues, (Weiss) Bolnick et al. (2014: 521) stress the need for scholars to consider other language classifications

for the Americas, such as Campbell (1997), when evaluating relationships between language and genes in order to avoid misleading results.

The data supposedly linking Purepecha to other Chibchan languages are also problematic, containing orthographic and transcription errors as well as excessively liberal semantic extensions. Greenberg allowed himself an equal - if not greater - degree of semantic latitude than Swadesh with respect to identifying cognate candidates. Indeed Greenberg, unlike Swadesh, did not operate from a standard list of meanings, nor did he offer any criteria for acceptance as a cognate form (McMahon & McMahon, 1995: 19-26). In addition to the lexical cognates (see Appendix C), Greenberg also lists five structural features that link Purepecha to other languages in the sub-grouping: 2SG and 3SG person markers, 'with' (the so-called 'sociative' affix), a nominaliser, and the past tense suffix, as presented in Table 11.

Meaning (Greenberg, 1987)	**Purepecha form**
2SG	-sdashke(-ni) (1sg acts on 2sg)
3SG	i- (this, that, he)
with ('sociative' affix)	-pi (to be joined, together, similar), pipi, pire (man's older brother)
nominalizer	-ni
past tense suffix	-š

Table 11: Meaning and Purepecha lexemes for structural 'cognates' in Greenberg (1987)

Not only has Greenberg taken a semantic liberty with the 2SG and 'with' meanings, he has also included a number of errors: (i) one grammatical person acting on another is expressed by an applicative suffix, which is found within the verbal complex and takes the form *-chu* for 1/2.O, coupled with subject and object person markers, none of which take the form given by Greenberg (see Chamoreau, in press); (ii) *i-* is indeed the root of the demonstratives *ima* and *inte*, where the former also fulfils the role of 3SG, but alone it does not perform this function (see Section 1.5.2.1); (iii) for notions

of 'with', Purepecha uses a comitative case marker *-nkuni* and an instrumental case marker *-mpu*, not *-pi*;[46] (iv) the main nominaliser is *-kwa*, or *-ka* in some varieties, while *-ni* is a fused nominalising element (see Chapter 6); (v) the past tense is marked with *-p* or *-an* depending on the mode and aspect with with they co-occur, while *-š* marks the aorist, indeed an aspect not a tense. With such a poor starting point for gathering comparative data on structural features, the likelihood of finding meaningfully related forms can only be low. Moreover there needs to be lexical data on which to base comparisons of structural forms (see Section 5).

Of the 98 languages that Greenberg lists as sharing at least one cognate form with Purepecha, Cuitlatec (an extinct language isolate of western Mexico) possesses the most, with 22. These proposed cognates include forms as distant from each other, both phonologically and semantically, as Purepecha *vera-* 'dark' (the first entry for the meaning 'black') and Cuitlatec *puluši-li, puruši* 'black'. The Purepecha word for 'black' is actually *turhipiti,* an equally unlikely cognate candidate. The next five closest languages in the grouping are Paez (Paez) and Colorado (Barbacoan) with 14 cognate candidates each, Cayapa (Barbacoan) and Kuna (Chibchan), with 13 each, and Warao (isolate) and Terraba (or Teribe (Chibchan)) with 12 each. At the family level, Chibchan has by the far the highest number of shared cognate candidates with Purepecha, totalling 124 spread across 31 languages, although no single language shares more than 13 terms. The Barbacoan and Misumalpan families share 30 terms each with Purepecha, while the Paezan family shares 26, Chocoan 23, and Yanoaman 21. All the other sub-families share fewer than 20 terms of the 68 identified by Greenberg, a proportion that Swadesh would readily accept as indicative of a more recent relationship, although these are similarly based on cognate identification methods that lack the appropriate rigour to be taken seriously. Once more, the lack of phonological correspondences between terms with similar meanings prevents the application of any further steps of the Comparative Method.

Given the unconvincing nature of previous classification proposals, coupled with the numerous existing critical evaluations of these classifications, the natural

[46] There are no case markers resembling *–pi* in Purepecha; the closest we can find in terms of form is the antipassive *-pe/-pi,* which function very differently from what Greenberg describes here, often also emerging in adjectival forms (see Section 1.5.2).

question to pose at this juncture is: why revisit the question of Purepecha's genealogical position? Is it not a closed book? While superficially it may appear so, I propose that it is worth re-opening the case for two reasons. First, although the classification proposals put forward to date are clearly inadequate in terms of their data and methods, and have been rightly criticised on both counts, it is worth emphasising that they have never been re-tested using carefully controlled data and clearer, more up-to-date methodologies (see McClaran, 1977). Campbell (1997: 325-326) also notes that, while he believes the Purepecha-Quechua connection to be highly unlikely, he does admit that existing proposals (particularly Swadesh, 1967) are based on insufficient data. Second, the archaeological and genetic evidence for a connection between the Andes and West Mexico is suggestive enough to warrant continued linguistic investigation. This paper reacts to both criticisms, using standardised, more extensive wordlists and up-to-date quantitative techniques to test for relatedness between the languages in question.

At this point I should also clarify why I am only considering the languages detailed in Swadesh and Greenberg's classification proposals in the lexical part of the study. If relationships with these languages are not convincing, the logical next step would be to look elsewhere for candidate sister languages, and to also test them. However, the issue that immediately emerges is where to look for these candidate languages, and on what grounds. Given that we have only a limited understanding of the prehistory of the Purepecha people, including their migration and settlement patterns, any such search for possible connections is necessarily partially speculative. Moreover, many languages (or rather their speakers) have died out in Mexico, as well as across the Americas, since the arrival of the colonists, therefore the pool of possible languages to choose from is restricted beyond our control. On the basis of this limited information, as well as the relationships proposed in two versions of the Automated Similarity Judgment Progamme (ASJP; see Section 3.1), I collected wordlists from over 30 languages of North, Central and South America. A qualitative inspection of these wordlists offered up no other candidate relations, therefore I decided to pursue further the existing proposals, as both a test of the support for the Swadesh proposal

from other disciplines, as well as a test of method. I will present the methods used in previous studies as well as the present one in Sections 2.3.1 and 2.3.2 that follow.

2.3. Methods

2.3.1. Methods used in previous studies

Earlier comparative studies for Purepecha such as Belmar (1910); Swadesh (1957) and Greenberg (1987) employed largely inspectional methods to identify possible cognate forms. However, the limitations of such methods, especially in cases where contemporary or historical documentation of the languages in question is limited, have been clear since the mid-twentieth century. Inspired by the development of radiocarbon dating as a means of measuring elapsed time, in the early 1950s Morris Swadesh began to develop lexico-statistics, a distance-based method for inferring language relationships (e.g. Swadesh, 1954, 1955).[47] This method calculates the distance between any pair of languages on the basis of the percentage of shared, ideally culturally-neutral or 'basic', lexemes, which have already been coded for cognate status (i.e. cognate, non-cognate or borrowed), albeit often by inspectional methods, as in the case of Swadesh (1967). Its calculations are simple: the higher the proportion of cognates, the closer the relationship between the languages. In turn, this proportion of shared cognates can be translated into centuries of separation between languages, using a method known as glottochronology.[48] Glottochronology assumes a constant rate of lexical replacement, whereby after 1000 years two related languages would still be expected to share 81% (± 2%) of their basic vocabulary, after 2000 years they would share 81 x 81, so 66%, and so forth. Using both of these methods Swadesh proposed relationships and associated time depths between Purepecha and various languages of North and South America, notably the Macro-Penutian family (Swadesh, 1956), Maya-Totonac (Swadesh & Arana de Swadesh, 1960, in Arana de Swadesh, 1975), and Macro-Quechuan (Swadesh, 1967; see also Section 2.1).

[47] Swadesh credits the first effort at a mathematical proof of language relatedness to Collinder's (1948) 'La parenté linguistique et le calcul des probabilités' (Swadesh, 1954: footnote 10).
[48] While the two terms are often used interchangeably, the more punctilious – or pedantic – linguists continue to distinguish between them (Dunn, 2014; McMahon & McMahon, 2005).

The Automated Similarity Judgement Programme (ASJP) also measures the distance between pairs of languages, but on the basis of the phonological similarity of words rather than on the proportion of shared cognates (e.g. Brown et al., 2008). Each language in the ASJP database comprises a 40-term wordlist whose entries have been standardised using a coarse phonological representation. This representation collapses all phonemes into 41 classes, e.g. /a/ and /3/ are used for all central vowels, with the aim of maximising cross-linguistic comparability.[49] In order to gauge the distance between the lexemes for the same meaning in two languages, ASJP makes use of a Levenshtein distance measure, which calculates how many operations - substitutions, deletions and/or insertions - are required to turn one string of phonemes into another. For example, to turn a 'hawk' into a 'handsaw', it would require two substitutions and three insertions, or one deletion and four insertions, both yielding a difference of five (Dunn, 2014: 194-195). Different weights can be assigned to the various operations, and the measure can be normalized to account for differences in word length.

According to the ASJP tree of lexical similarity, Purepecha is most closely related to Timucua (an extinct isolate of Florida, USA) and Cayubaba (isolate, northern Bolivia), although previous versions (e.g. Müller et al., 2013) have suggested a closer relationship to the two now extinct Huarpean languages Allentiac and Millcayac of western Argentina, Cofán (isolate, northern Ecuador), and three Huitotoan languages of the Peru-Colombia border region: Ocaina, Nonuya and Huitoto. These connections do not occur anywhere in previous comparative historical literature, and a more detailed inspection of the unmodified wordlists supports this absence. The unlikely nature of these candidate linguistic relations may stem from an inherent limitation of the Levenshtein distance method, namely that it can identify similarities in phonology and phonotactics irrespective of whether two languages are related, especially in a more restricted phonological space. The measure is generally a good proxy for historical relatedness when two languages diverged recently, but struggles when it comes to long distance or deep time comparison (Dunn, 2014). I

[49] The reduced phonological distinctiveness of the meanings is compensated for by the huge scope of the database (Dunn, 2014), namely 4664 individual languages as of 09/12/2016 (see http://asjp.clld.org/).

will now turn to the methods applied in this study, which are more appropriate for these kinds of comparisons.

2.3.2. Methods used in this study

A persistent problem for statistical methods that infer language relatedness has been evaluating the plausibility of cognate candidates. Oswalt's (1970) "Shift Test" was an important methodological proposal to address this problem. In its original formulation, Oswalt suggested taking a pair of aligned wordlists, calculating the proportion of apparent cognates, and then to shift the words of one list one place down, thus bringing the last one up to the top, and calculate the proportion of apparent cognates again. The latter process, if repeated, involves rotating the position of the words in one list relative to the other until the calculation has been carried out for all shifted positions. For a one hundred meaning list, this would mean doing one cognate rate calculation for the aligned lists, and another 99 for the shifted (and thus semantically unaligned) lists. The apparent cognate rates of the semantically unaligned lists give an indication of the distribution of rates that would be expected by chance. It is a simple statistical calculation to evaluate the probability of seeing the cognate rate calculated for the true alignment of the lists given this normal distribution.

The reason that Oswalt proposed the test in this form was purely pragmatic: it would require a great deal of effort to carry out the cognate counts for all the unaligned lists, and the Shift Test offered a way to keep the number of unaligned lists to be inspected down to a reasonable number (or perhaps not even then: the test was discussed more as a theoretical possibility than it was carried out in practice). With improvements to personal computing, new ways became available to carry out the cognate candidate identification step, and it became feasible to carry out an expanded form of the test. Dunn and Terrill (2012) introduce the Oswalt Monte Carlo Test, a variant of the Oswalt Shift Test which uses randomisation to produce the unaligned lists rather than rotation. This requires a very much greater number of semantically unaligned comparisons, but it puts the interpretation of the results on a much firmer statistical footing (Good, 2006). This large number of cognate comparisons is feasible

due to the rise of automatic cognate detection methods. Dunn and Terrill (2012) use a Levenshtein string edit distance measure with a threshold for identifying cognate candidates. Subsequent work by List (2014) improves the methodology for automatic cognate detection using multiple sequence alignments, with List and Forkel (2016) providing a convenient implementation. This is the state of the art in automatic cognate detection and, when used in the Monte Carlo framework, provides a statistically sound, rigorous and reproducible test for identifying greater than chance similarity in wordlists. I apply this method to investigate the similarity of the Swadesh 207 wordlist for Purepecha to wordlists from the candidate relatives proposed in the classifications of Swadesh and Greenberg discussed in Sections 2.2.1 and 2.2.2.

2.4. Results

The Oswalt Monte Carlo test fails to detect a signal of relatedness between Purepecha and any of the other languages of the sample, except for with Aymara (with a z-score of 7), and Rama and Xinca (with a z-score just over 3, the arbitrary cut-off point). However the putative Purepecha-Aymara cognates are not impressive; it seems that excess weight has been given to a similar suffix they both have for verbs in their citation form, namely with the non-finite suffix *-ni* in Purepecha and *-ɲa* in Aymara. When these non-finite suffixes are removed and the test re-run, the signal disappears, leaving the nine cognate candidates listed in Table 12.

Meaning	Purepecha	Barí	Chibcha	Guaymi	Rama	Xinca	Zuni
ear	kuʧ̑ikʷa		kuhuka				
father	taati	a:taida					
guts	sutuɽi					ʔoʃoka	
how	na			ɲɤ	ni:		
small	sapiʧ̑u					ʧ̑iriki	
to flow	joɽe					tiri	
to hunt	ata						ɬata
to wash	xupa					potsʔa	
who	ne			nire			

Table 12: Automatic Cognate Judgments and Alignments with Purepecha

It may be noteworthy that all the languages, with the exception of Zuni, that possess at least one cognate candidate with Purepecha come from Greenberg's classification. However, given that Xinca has the largest number of cognate candidates, with only four, and all the correspondences are unconvincing, this may simply be a coincidence. It should be stated that these are unlikely cognate candidates, displaying no internal phonological systematicity in their correspondences (which is of course impossible for languages where only one candidate appears) despite the semantic proximity of the lexemes. More important for the purposes of this paper is that no language in either the Greenberg or the Swadesh sample possesses more cognate candidates than would be expected by chance. It is of even more significance that Quechua presents no cognate candidates, despite the insistence of Swadesh, Greenberg and Liedtke to the contrary.

2.5. Structural features

Having established that no evidence can be found in basic vocabulary to support the classification proposals for Purepecha of both Greenberg (1987) and Swadesh (1967), I now turn to comparative morphosyntax. Dunn et al. (2008: 715) argue that structural features from multiple domains, including morphology and syntax "can yield distinguishable profiles that allow us to investigate historical relations between languages, whether such relations arise from descent or contact". Even in cases where

phonological change and semantic change have conspired to prevent the identification of lexical cognates (or loanwords), it may still be possible that other structural domains retain a signal of inheritance or contact (Reesink & Dunn, 2012: 35). However, typological features cannot be used to claim or prove a genetic relationship between languages in the absence of systematic phonological correspondences in the lexicon, that is, without a systematic application of the comparative method. That such structural similarities continue to be used to this end can be considered one of the "guilty secrets" of comparative historical linguistics (Dunn & Reesink, 2012: 34). The reason for this guilt lies largely in the relative size of the design space for the two types of features. Structural features inhabit a much more limited design space than lexical items, therefore the likelihood of the former being similar in two unrelated languages is much higher than for the latter (idem.). Moreover, structural similarities may also be indicative of change through prolonged language contact, such as in the Vaupés region of the Brazilian and Colombian Amazon, where indirect diffusion of grammatical categories and patterns between unrelated languages is rife, but borrowing of lexical forms is rare (Epps, 2007).

Of all the languages that have been claimed to be related to Purepecha, Quechua appears structurally the most similar. Both are completely suffixing, agglutinating languages, with nominal-accusative alignment, they both mark the direct and indirect object of a clause with the same case marker (labelled 'accusative' in Quechua and 'objective' in Purepecha), are predominantly dependent marking, can have SOV constituent order (see Section 1) and only postpositions. Furthermore Purepecha is a typological outlier in its Mesoamerican context (Chamoreau, in press), displaying various areally atypical features. One of these features is its complete reliance on suffixes, since languages with more prefixes than suffixes predominate in Mesoamerica (Dryer, 2013). In contrast, languages of the Andean region, including Quechua, display a general preference for suffixing over prefixing (idem.). Such structural parallels, combined with the aforementioned archaeological and genetic evidence for possible long-distance contact between Mesoamerica and the Andes (see Section 2, see also Chapter 3), merit a closer analysis. Therefore we now consider whether this most prominent of structural features – the order and function of verbal

suffixes – can function as an indicator of a relationship between the two languages, or whether the similarity can be explained by chance, that is as the result of a more restricted design space.

2.5.1. Affix ordering in Purepecha

As indicated above, Purepecha verbs (as all other word classes) are completely suffixing, containing up to 12 linearly ordered slots following the root to express categories of locative, directional, causative (also valency), voice/valency, desiderative, adverbial, 3PL object (applicative), aspect, tense, irrealis, and mood (Chamoreau, in press). An optional (in some varieties) 13th slot is filled by pronominal enclitics expressing the subject and sometimes also object of the verb phrase. It is not obligatory, or even possible, to fill all 13 slots simultaneously; in reality only up to seven or eight slots are filled and more often than not it is fewer still (Friedrich, 1984). Table 13 presents the maximal structure of the Purepecha verb, following Chamoreau (in press).

√	1	2	3	4	5	6	7	8	9	10	11	12
Stem		Derivational suffixes							Inflectional suffixes			
√	SF	LOC	DIR	CAUS	VCE/ VAL	DES	ADV	3PL.O	ASP	TNS	IRR	Mood

Table 13: Maximal structure of the Purepecha verb

However, other descriptions of Purepecha place the adverbials, including both directionals and adverbials proper, before the suffixes of locative space, namely immediately following the root. For example, Friedrich (1984) identifies three parts to the verbal template: the root, the theme formative and the conjugational suffixes. More concretely these three parts comprise 11 slots, namely: the root, the reduplicated root, (inner layer) voice (equivalent to Chamoreau's stem formatives), adverbials (Chamoreau's directionals), spatials, instrumental-jussive (a sub-set of Chamoreau's voice/valency), (outer layer) voice (a separate sub-set of Chamoreau's voice/valency), (outer layer) adverbials (including types of motion, all of which also have aspectual value), first conjugational (aspect, etc.), second conjugational (person) and enclitics

(of subject and object). Monzón (2004) offers a similar template, whereby adverbials precede spatial locatives, when the two suffix types co-occur.

Irrespective of the template one chooses to follow, a number of important points hold for the Purepecha verb. First, derivational suffixes are located closer to the stem than inflectional suffixes, reflecting a frequently noted universal principle of affix ordering (e.g. Rice, 2011; Manova & Aronoff, 2010; Bybee, 1985). Second, the suffixes occur in the order presented in the respective template. Third, members of the same category generally do not co-occur, with two main exceptions: (i) a small number of locative suffixes can appear in pairs in slot two (see also Section 5.2.1), and (ii) voice/valency suffixes can also appear in pairs, or even threes, such as two causatives to indicate indirect causation, a combination of a reciprocal and a causative or a causative and a passive (see Capistrán Garza, 2015 for a full description of the various suffix combinations, as well as their respective syntax and semantics).[50] Fourth, not all categories must be expressed: in the TAM domain; only mood is obligatory, while aspect can co-occur with tense and mood, but irrealis (or future, see Chamoreau, 2000: 116-117) can only occur with mood. When these TAM categories co-occur their relative positions are fixed.

The relatively strict ordering of suffixes suggests that the Purepecha verb is, at least partially, morphologically templatic[51] (see, e.g., Rice, 2011: 188-193; Bickel & Nichols, 2007: 216-219), where templates constitute "morphological systems in which morphemes or morpheme classes are organized into a total linear ordering that has no apparent connection to syntactic, semantic, or even phonological organization" (Inkelas, 1993: 56, cited in Rice, 2011: 189). The seemingly arbitrary placement of the 3.PL.O suffix (marked in bold) in slot 8 seems to support such an analysis (1).

[50] Note also that "[t]he coexistence of two applicative suffixes is possible, but is restricted to constructions in which the second argument corresponds to the possessor of the first, both arguments being introduced by the applicative voice" (Chamoreau, in press).
[51] Template morphology is also referred to in the literature as position class morphology or slot and filler morphology (Rice, 2011: 188). For reasons of brevity and clarity, I use the terms template or templatic morphology only.

(1) thiri-ra-**a**-x-ka
eat-CAUS-**3.PL.O**-AOR-ASS.1/2.S
'I fed **them**.' (lit. 'I made **them** eat') (Adapted from Chamoreau, in press)

However, languages commonly display properties of both templatic and configurational (or compositional) morphology. The ordering of affixes in a configurationally-constructed verb is not rigid and arbitrary, but rather operates according to one or more grammatical principles, such as syntactic, semantic, phonological and morphological, and/or extra-grammatical principles including frequency, productivity or parsability (see Rice, 2011: 170; Manova & Aronoff, 2010). In such mixed systems individual morphemes (here, suffixes) can instantiate properties of one set of principles or the other. We have just seen how the 3PL.O suffix fills the eighth slot in the Purepecha verb on the basis of formal criteria only, but the same cannot be said for all the suffixes that precede it. In particular, the locative suffixes in the first slot following the root have a direct effect on its semantics.[52] Bybee (1985: 15) explains this relationship in terms of relevance, whereby "[a] category is *relevant* to the verb to the extent that *the meaning of the category directly affects the lexical content of the verb stem"*. I will expand on explanatory models for affix ordering in Section 2.5.3. Example (2a) includes the verb 'to wash' without a locative space suffix, whereas one is present in (2b), where the action of washing is directed to a particular location, here the face marked by *-narhi*.[53] A similar scopal relation holds for the relative ordering of the voice/valency (here reciprocal and causative, highlighted in boldface) suffixes in (2c) and (2d), whereby changes in the order of the suffixes alter the reading of the phrase.

(2a) nanaka jupa-xa-p-ti sirit'akwa-ni
girl wash-PROG-PST-3.S dress-OBJ
'The girl was washing the dress.' (Adapted from Chamoreau, in press)

[52] A similar effect can be observed for the directional suffixes, but in the interest of brevity, I only present examples for locative suffixes and stem formatives.
[53] For a more detailed discussion of the paradigm of locative space suffixes, see Sections 1.5.2 and 5.2.

(2b) jupa-narhi-xa-p-ka=ri
wash-LOC.SP-PROG-PST-ASS.1/2.S=2.SG.S
'You were washing your face.' (Adapted from Chamoreau, in press)

(2c) tumpi-icha ata-**p'era-tara**-a-s-ti sapi-icha-ni
boy-PL strike-**REC-CAUS**-DISTR-PERF-3.S.ASS child-PL-OBJ
'The boys made the children strike each other.'
*'The boys made each other strike the children.'
(Adapted from Capistrán Garza, 2015: 160)

(2d) juchi náanti=ts'ïni jikwa-**ra-p'era-tara**-s-ti
1.SG.POSS mother=1PL.O wash-**CAUS-REC-CAUS**-PERF-3.S.ASS
'My mother made us bathe each other.'
(Adapted from Capistrán Garza, 2015: 160)

In (2c) and (2d) the different sequential orders correspond to different semantic and morphosyntactic structures, which convey specific co-referential relationships; "that is, the linear order of the suffixes reflects that of the causativization and reciprocalization processes and, therefore, the scope of the reciprocal morpheme can be predicted" (Capistrán, 2015: 160). However, this configurational scopal relationship does not always hold, as in some combinations of the causative suffix and the indefinite object marker -p'i (see Capistrán, 2015: 164-166 for examples and more details).

It should be emphasised that stem formatives also seem to be especially *relevant* to the root (3), leading to a change in meaning of the latter. Note that in the case of (3) both the root *mi-* and stem formatives *-ka* and *-ta* are difficult to translate, although the latter can be analysed as homonymous with the causative marker, and neither verb can be considered more basic than the other (see Chapter 6 for a more detailed discussion of the relative role and meaning of roots and suffixes). Note that the word-final suffix *-ni* is an indicator of non-finite aspect, the typical citation form for verbs.

(3) mi-ka-ni ‘to close’
mi-ta-ni ‘to open’

I will turn now to Quechua, whose verb displays considerably more configurational structure and which has been the subject of much more scholarly discussion.

2.5.2. Affix ordering in Quechua

In general terms the Quechua verb resembles its Purepecha counterpart in that it contains only suffixes and also follows the aforementioned cross-linguistic universal of placing derivational suffixes closer to the root than inflectional suffixes. Adelaar with Muysken (2004: 209) assert that “the order in which suffixes occur in a verb form is essentially fixed, although more than one option may be available in some parts of the suffix inventory.” The fixed element of this statement certainly holds for the inflectional suffixes, or what Muysken (1986) refers to as the ‘inflectional mode’ suffixes, which express the categories of tense, person and number.[54] These suffixes do indeed follow a strict order and, as such, their constituent structure can be considered largely templatic in nature (see notably van der Kerke, 1995).

The internal ordering of the larger group of derivational suffixes, called the lexical and syntactic mode suffixes by Muysken (1986), is much more complex. These suffixes constitute a very heterogeneous set, semantically and functionally speaking, thereby constituting the richest and most complex part of Quechua morphology (Adelaar with Muysken, 2004: 229). This complexity stems from the fact that certain suffixes can recur in different verb ‘slots’ and groups of suffixes with similar functions, such as voice and valency suffixes, can co-occur in various combinations. Indeed Muysken (1986: 635) explicitly states that in Quechua “[a] number of affixes can occur in VARIOUS ORDERS with respect to each other, and this is excluded in the

[54] In Quechua I varieties, namely those spoken in Central and Northern Peru such as Ancash Quechua, number is indicated by derivational suffixes that are inserted between the root and personal reference endings (Adelaar with Muysken, 2004: 221). This is simply one of many examples that highlight the internal diversity in affix ordering and extent of affixation in the Quechuan languages. For in-depth studies of individual varieties, the interested reader is referred to descriptive grammars such as Parker (1976) for Ancash Quechua or Parker (1969) for Ayacucho Quechua.

slot matrix approach." A schematic outline of possible suffix orderings in Ancash Quechua is presented in Figure 3.

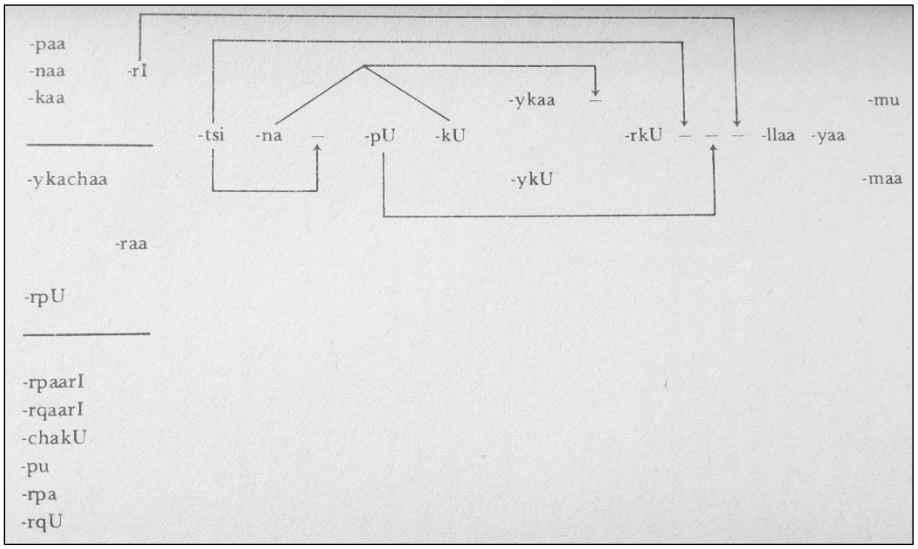

Figure 3: Affix ordering in Ancash-Huailas Quechua (Parker, 1976: 132)

In Figure 3, the arrows indicate the possible variable orders, while the horizontal lines indicate that a particular co-occurrence is not permitted. Otherwise every suffix may precede every other suffix (or sequence) that occurs to its right, with the exception of a number of special cases outlined in Parker (1976), which I will not discuss here for reasons of space. The key point to note, however, is the amount of movement allowed for the suffixes in the centre of Figure 3. Indeed, given the various ordering options it is difficult to model the derivational part of the Quechua verb using a linear, templatic approach (van der Kerke, 1995: 38; but see Yokoyama, 1951 for a 19-place slot matrix description) as is possible for Purepecha (see Section 5.1).

Moreover the ordering of suffixes "need not reflect the logical semantic build-up of the verb" (Adelaar with Muysken, 2004: 232), making Quechua less transparently compositional than Purepecha. These differences in ordering and their associated, non-linear interpretations are exemplified in the Tarma Quechua examples

in (4a-b), where the inverted position of the plural morpheme, highlighted in boldface, is unexpected and does not seem to offer any difference in semantics.

(4a) wata-**rga**-ya:-či-n
tie-**PL**-PROG-CAUS-3.S
'They are having it tied.'

(4b) wata-ra-:**ri** či-n
tie-PRF-**PL**-CAUS-3.S
'They (eventually) had it tied.'
(Adapted from Adelaar with Muysken, 2004: 232)

Similarly, the valency-changing suffixes *-na* 'reciprocal', *-chi* 'causative' and *-ku* 'reflexive' can be combined in various ways in order to express different semantic interpretations. The co-referenced arguments are indicated with subscript /i/ and the separate argument with /j/ in examples (5a-b) to clarify the different readings.

(5a) riku-chi-na-ku-n-ku
see-CAUS-REC-REF-3-PL
'They$_i$ caused each other$_i$ to see them$_j$.'[55]

(5b) riku-na-ku-chi-n-ku
see-REC-REF-CAUS-3-PL
'They$_j$ caused them$_i$ to see each other$_i$.'
(Adapted from Muysken, 1986: 636)[56]

[55] Muysken's translations sound a little forced to the native English ear; a translation using the more natural make-causative construction renders the examples easier to understand, namely 'They made themselves see them' and 'They made them see each other' respectively.
[56] The data in (5a) and (5b) are from Ayacucho or Cuzco Quechua. Parker (1969) first treated such complex verbal forms in some detail for the Ayacucho variety, checking all the possible combinations and affix ordering options. It should be noted that in (5b) one would expect to find *riku-na-**ka**-či-n-ku* rather than **riku-na-**ku**-či-n-ku*, since the lowering of suffix-final vowels is compulsory before /-*či*-/ in these varieties, yet Muysken (1986) does not reflect this fact. I am indebted to Willem Adelaar (pers. comm.) for this clarification.

Muysken (1986: 636) claims that the interpretation of these forms in depends on the successive addition of affixes, such that the root is first either causativised (5a) or made reciprocal (5b) and then the sum of those meanings is adapted according to the suffixes that follow. In his treatment of Ancash Quechua, Parker (1976: 133) also states that "[…] every suffix modifies everything that occurs to its left. When two suffixes can combine in two ways, variable order, the meaning varies according to the order because this determines the modification scope of each suffix" (my translation). In such a system, the addition of each subsequent suffix alters the argument structure and semantic interpretation of the construction (Miller, 1993: 45), with each successive morpheme scoping over all those to its left. However, given that both translations in (5a-b) refer to causative-like actions, meaning that the root is first made causative, such an interpretation seems potentially misleading. I review semantic and cognitive explanations of affix ordering in Section 5.4.

In order to account for this variable ordering of derivational suffixes, van der Kerke (1995: 67) proposes a cluster model instead of a strict matrix of position classes as in Purepecha (see Figure 5) and as posited for Quechua by, for example, Yokoyama (1951). The clusters in this model display varying ordering behaviours, whereby the directionals follow a strict order, like the inflectionals, but the verbal modifiers and higher verbs can appear in flexible orders, as in (4a-b) and (5a-b). The flexible suffixes then follow hierarchical principles of semantic scope to account for their variable behaviour.

Root	Verbal modifiers	Adverbial modifiers	Distributors	Higher verbs	Directionals
	Verbalisers	Intensifying	Reciprocal	Causative	Reflexive
	'Heavy' suffixes	Intentional	Distributive	Desiderative	Bi-locational
	Repetitive	Hortative		Assistive	Benefactive
	Stative	Inceptive			
	Frequentative				
	Local distributive				

Figure 4: Derivational affix clusters in Quechua (following van der Kerke, 1995: 67)

However, a clear mapping of suffix ordering, to semantic interpretation is not always observable. In the examples in (4a-b) and (5a-b) we saw how variable suffix ordering can give different semantic readings for a verb form, yet different readings can also occur when a given morpheme does not move. Take, for example, the sentences in (6a-b), where the combination of suffixes in (6a) has only one reading, while the combination in (6b) is ambiguous, even though the causative suffix *-chi* occupies the second valency morpheme 'slot' in both cases.

(6a) *Tarata Quechua (Quechuan)*

mama-y	p'acha-ta	t'asqa-kipa-**chi**-wa-rqa
mother-1SG	cloth-ACC	wash-REP-**CAUS**-1O-3SG.PST

'My mother made me rewash the clothes (I didn't do it properly).'
(*Again my mother made me wash the clothes)

(6b)

Maria-wan	p'acha-ta	t'asqa-ri-**chi**-y
Maria-COM	cloth-ACC	wash-INC-**CAUS**-IMP

'Make Maria wash the clothes for a short time/Please, make Maria wash the clothes.' (Both adapted from van der Kerke, 1995: 175)

Contrasting the ordering principles in the two languages, it is clear that a cluster-based approach is both unnecessary and inappropriate for Purepecha, since such a small amount of variation in suffix ordering can occur. The difference in degrees of compositionality between Purepecha and Quechua is striking; the former combines a templatic structure with a small amount of compositionality whereas the latter is much more strongly compositional, allowing variation in some derivational suffix order, especially with respect to the voice and valency set. Both languages share the general feature of derivational suffixes preceding inflectional, and valency changing suffixes preceding those marking TAM, but we will see in the following two sections that such preferences may not be indicative of any kind of relationship, but rather due to general historical-typological and psycholinguistic principles of word formation.

2.5.3. The cross-linguistic suffixing preference

Of the 969 attested languages in WALS for the feature 'affixation as a means of expressing inflection', 406 (42%) display a strong preference for suffixes.[57] A further 123 are categorised as weakly suffixing (13%), meaning over half of the world's languages prefer suffixing to prefixing in relation to affixation in inflectional morphology. Around 15% of languages show an equal preference for prefixing and suffixing, with roughly the same amount having little affixation available to them. This leaves less than 10% of languages with a weak prefixing preference and only 58 languages (6%) with a strong prefixing preference (Dryer, 2013). This left-right imbalance is striking, especially considering that it holds even in cases where independently motivated categories, namely other structural features such as verb-initial word order and the presence of prepositions, would predict the opposite (Cutler, Hawkins & Gilligan, 1985). In other words, something is driving rightward-occurring categories (suffixes) over leftward-occurring ones (prefixes).

Dryer (2013) was certainly not the first to highlight the asymmetry in cross-linguistic affixing preferences. Sapir (2010 [1921]: 59) observed the primacy of suffixing among the three affixing types - prefixing, infixing and suffixing - although

[57] While I recognise that the focus of this study is derivational rather than inflectional affixes, since the former precede the latter, it is a fair to use this WALS chapter as a means of identifying suffixing languages.

it was Greenberg (1957) who really began to examine the reasons for this preference in a more systematic, cross-linguistic manner (Bybee, Pagliuca & Perkins, 1990). Since then studies from several domains of linguistics have offered accounts to try and explain the suffixing preference. Psycholinguistic accounts (Hall, 1988; Hawkins & Cutler, 1988; Cutler, Hawkins & Gilligan, 1985) offer a processing explanation for the suffixing preference, arguing that word onsets are the most psychologically salient part of the word, therefore language users prefer to process them first, leading to a preference for stems occurring before affixes. These factors interact with linguistic processes, leading to the development of more languages with grammatical matter following the stem rather than preceding it, to wit suffixes. From a diachronic perspective, the argument is more circular and less explanatory. Many historical linguists have pointed out that affixes represent the result of processes of phonological and semantic attrition of former lexical items, which evolve initially into grammatical material and then into affixed, semantically empty material (see, e.g., Lehmann, 2015). The position of this affixed material largely reflects the position of the earlier lexical material, either before or after the verb, yielding prefixes or suffixes respectively (Bybee, Pagliuca & Perkins, 1990). However this account does not explain why language users prefer to grammaticalise postposed material more than preposed (however see Givón, 1979 for a more explanatory account based on universal SOV word order and its associated suffixing preference), nor why a preference for prefixing exists in certain areas, such as Mesoamerica. Of particular note is Hall (1988), who seeks to marry the processing and diachronic accounts with a dynamic explanation, whereby "diachronic semantic and (morpho-)phonological principles seem to be quite transparently derivable from processing and higher level communicative principles" (Hall, 1988: 345).

Putting the mechanisms that bring about the predominance of suffixes cross-linguistically to one side, let us turn our attention to other languages in the Americas and further afield that also display a strong suffixing preference. The aim here is to try and identify whether more convincing parallels in affix ordering between Purepecha and languages with similar verbal template structures could be indicative of some kind of relationship, either through (likely ancient) common ancestry or

contact, or whether broader cross-linguistic patterns can be identified. The sample to be discussed is presented in Table 14.

Language name	Language family	Glottolog code	Macro-area
Choguita Rarámuri	Uto-Aztecan	tar	North America
Cupeño	Uto-Aztecan	cup	North America
Eastern Pomo	Pomoan	peb	North America
Muylaq' Aymara	Aymaran	ayc	South America
Turkish	Turkic	tur	Eurasia
Crimean Tatar	Turkic	crh	Eurasia
Aleut	Eskimo-Aleut	ale	North America
West Greenlandic	Eskimo-Aleut	kal	Eurasia
Central Siberian Yup'ik	Eskimo-Aleut	ess	Eurasia
Inupiatun	Eskimo-Aleut	esk	North America
Nuuchahnulth (Nootkan)	Wakashan	nuk	North America
Yana	Isolate	ynn	North America
Takelma	Isolate	tkm	North America
Klamath-Modoc	Isolate	kla	North America
Patwin	Wintuan	pwi	North America
Maidu	Maiduan	nmu	North America
Chamalal	Nakh-Dagestanian	cji	Eurasia
Godoberi	Nakh-Dagestanian	gdo	Eurasia
Tsez	Nakh-Dagestanian	ddo	Eurasia
Hinuq	Nakh-Dagestanian	gin	Eurasia
Awa Pit	Barbacoan	kwi	South America
Teribe	Chibchan	tfr	South America
Aguaruna	Jivaroan	agr	South America
Chamí Embera	Chocoan	cmi	South America
Northern Embera	Chocoan	cto	South America
Epena Pedee	Chocoan	sja	South America
Barasano	Tucanoan	bsn	South America
Wikchamni	Yokutsan	yok	North America

Table 14: Sample of languages with strong suffixing preference

The sample contains languages whose suffixing preference is indeed only a preference, allowing one (the Nakh-Dagestanian languages and Aguaruna), two (Northern Embera, Cupeño and Eastern Pomo), three (Klamath-Modoc), or even four (Takelma) prefixes in addition to suffixes. The remaining languages allow only suffixes in the verb, ranging from a maximum two (Hinuq) to 15 (Muylaq' Aymara) suffixes following the root. It also constitutes a convenience sample, with a larger number of languages included from the Americas (12 from North America and eight from South America, over half of the total), as it is here where more interesting parallels with Purepecha are likely to emerge (but see Section 2.2 for an overview of the more and less outrageous connections between Purepecha and other languages of the Americas and beyond). The non-American languages are included to provide evidence of suffix ordering patterns from outside the continent, as a (smallscale admittedly) control for the proposed pricinples of universality.

2.6. Comparative affix ordering

It is evident that verbal affixes do not occur with random distributions cross-linguistically; indeed for agglutinating languages to be inherently learnable, the ordering of affixes must proceed in a systematic and analysable manner. Miller (1993: 27) claims that the order of affixes is in fact universal, precisely for reasons of learnability. In Sections 2.5.1 and 2.5.2 I presented the order of verbal suffixes in Purepecha and Quechua respectively. While differences in their degrees of compositionality were noted, there were also clear parallels in the order of suffixes, namely the early position of voice and valency in relation to the root, followed later by aspect, tense and mood. I also noted the close semantic relationship between the root and the first suffix slot, the spatial locatives, in Purepecha.

Similar affix ordering patterns have also been identified in various other languages worldwide, as will also be observed in this sample. Such cross-linguistic parallels call for explanation, therefore a number of models have been proposed to do just that. These models can be broadly classified as cognitive, semantic, syntactic, or historical in nature (Miller, 1993; see also Mithun, 2000 for a model that attempts to cross-cut these separate frameworks). Given my own theoretical biases and

background, I will concentrate on the cognitive and semantic models, and refer the interested reader to Miller (1993) for an overview of key syntactic models.

Cognitive models can be traced back to Tesnière's (1939) study of compound tenses in Indo-European languages, in which he proposed the 'general law' of ordering of morphological markers as presented in (6).

(6) Voice – Aspect – Tense (of voice) – Mode – Tense (of mode)
(Tesnière, 1939: 177)

A similar schema is presented in Bybee (1985), presented in (7), where valence has been included in addition to voice in the leftmost position, as have agreement markers in the final position.

(7) Valence – voice – aspect – tense – mood – agreement (Bybee, 1985: 4)

As indicated in Section 2.5.1 with reference to Purepecha suffix ordering, Bybee (1985) accounts for this ordering, or 'ranking', in terms of *relevance.* For example, aspect is more relevant to the verb stem than, say, subject agreement, since it alters the internal temporal condition of an action or state, both of which are represented by the verb stem or root. It would therefore be expected that the more relevant suffixes would appear closer to the verb stem, namely in a more leftward position (recall also the extreme leftward position of Purepecha's spatial locatives). Voice and valence are particularly relevant since they alter both the meaning and the argument structure of the stem. Tense is less relevant than valence or aspect since it is not solely relevant to the stem, but has scope over the whole preceding proposition. The more relevant an element, the higher its cultural and cognitive salience (Bybee, 1985: 13-14).

In nineteen of the 28 languages[58] in the current sample we can observe suffix orders that follow these cognitive models, namely in Aguaruna, Awa Pit, Barasano,

[58] Teribe (Chibchan) expresses valency changing operations largely lexically, so it is not included in this discussion.

Central Alaskan Yup'ik, Chamalal, Chamí Embera, Choguita Raramui[59], Crimean Tatar, Epena Pedee, Ghodoberi, Hinuq, Inupiatun[60], Maidu, Northern Embera, Patwin, Tsez, Turkish, West Greenlandic and Wikchamni. The presence of the applicative suffix (marked in bold) in the first slot following the verb in Aguaruna (8) is a clear example of the primacy of the valency suffix, after which appear suffixes of *Aktionsart*, tense, number and mood, largely in line with the ordering models in (6) and (7).

(8) *Aguaruna (Jivaroan)*

wi hu-**hu**-ki-ma-ha-i api-na[61]
1SG take-**APPLIC**-TRF-RECPAST-1SG-DEC book-ACC
yatsu-hu-na
brother-1SG-ACC
'I took a book from my brother' (Overall, 2007: 465)

Some languages display greater degrees of compositionality than others. In (9) observe the co-occurrence and relative ordering of three voice and valency suffixes - reflexive, causative and passive - in Crimean Tatar.

(9) *Crimean Tatar (Turkic)*

men juv-**un-dɯr-ɯl**-ma-dɯ-m
I wash-**REFL-CAUS-PASS**-NEG-PST-1SG
'I was not forced to wash myself' (Kavitskaya, 2010: 75)

[59] The case of Raramuri has been drastically simplified, since the relative ordering of suffixes is motivated by a complex combination of semantic, morphological and phonological constraints, further complicated by priming effects and morpho-phonological multiple exponence (see Caballero, 2010 for an in-depth discussion).

[60] It should be noted that the relative ordering of suffixes (or postbases as they are often known in the Eskimo-Aleut grammatical tradition) is flexible depending on the precise semantics to be expressed. As such, the first set of affixes for verbal derivation in Inupiatun (N. Eskimo) can either precede or follow the valency-changers in order to reflect differences in scoping and meaning (Seiler, 1997), while in Yup'ik, the causative marker may be either a postbase or a compound tense.

[61] Note that Aguaruna marks the direct and oblique objects of a clause with the same marker (ACC), a strategy also employed by Purepecha and Quechua.

The relative ordering of voice/valency suffixes in (9) is another example of a semantically-motivated configurational structure in which each subsequent suffix takes scope over all those to its left (see Fortescue, 1980), as in (9').

(9') wash]REFL]CAUS]PASS](NEG]PST]1SG)

However the voice/valency-first order proposed in the two cognitive models outlined above does not hold for Purepecha, as indicated in Table 9 (Chapter 1) and underlined in example (10). The closest suffix to the stem is the locative spatial, here *-t'a*.

(10) *Purepecha (isolate)*

ana-**t'a**-ta-s-ti	tsintsikata-rhu
be.vertical-**LOC.SP**-CAUS-AOR-ASS.3.S	wall-LOC

'He placed him upright near the wall' (Adapted from Chamoreau, in press)

In Aymara, Cupeño, Klamath-Modoc, Nuuchahnulth and Yana, suffixes of location or direction[62] also appear immediately following the verb root, as highlighted in boldface in examples (11a-d).

(11a) *Muylaq' Aymara (Aymaran)*

uk(a)-jam(a)	P'isal(a)-ø	macha-**nta**-ya-sin(a)
that-CP	Partridge-ACC	become.drunk-**IW**-CAUS-SUBR

'Thus inebriating Partridge…' (Adapted from Coler, 2014: 297)

(11b) *Cupeño (Uto-Aztecan)*

puy-**lu**-nin-vichu-qa
dine-**MOTP**-CAUS-DES-PRES
'He wants to make him go to eat.' (Adapted from Hill, 2005: 261)

[62] In Klamath-Modoc, valency-changing processes are expressed by prefixes, while aspect is suffixal in nature (see Underriner, 2002), therefore their relative ordering cannot be evaluated in the same terms as in the other languages of this grouping. As such, we will not consider the language further.

(11c) *Nuuchahnulth (Wakashan)*

ći-**'a·ʔa**='aƛ=uk ƛaqmis

pour-**in.fire**=TEMP=POSS oil

'One's oil is poured on the fire.' (Adapted from Davidson, 2002: 201)

(11d) *Yana (isolate)*

ʒu-**hbil**-si

dig.with.digging.stick-**moving.about.here.and.there**-3.MASC

'He taps around with a digging stick.'

(Adapted from Sapir & Swadesh, 1960)

Locational and directional affixes are not included in the cognitive models discussed above. However in Foley and Van Valin's (1984) model of affix ordering, directionals are considered to be a common nuclear operator cross-linguistically, that is they express the directional orientation of the nucleus or verb stem. As such, directionals are predicted to appear in a nuclear position, closer to the verb stem than categories of, *inter alia*, tense or evidentiality. Example (12) outlines the layered structure of the clause according to this model (Foley & Van Valin, 1984: 224).

(12) Stem – Aspect – Direction – Status – Tense – Evidentiality – Illocutionary force

However a problem with the ordering of the nuclear categories of aspect and directional is immediately apparent. In Purepecha, as in the other languages presented in (11a-d), aspect does not precede the directional suffix. A clear example of the centripetal directional *-pu* preceding progressive aspect *-xa* can be observed in (13).

(13) *Purepecha (isolate)*

chkari-ni kachu-ku-**pu-xa**-ti

wood-OBJ cut-SF-**DIR-PROG**-3.S.ASS

'He comes cutting the wood.' (Adapted from Chamoreau, in press)

The argument for aspect being a more inner suffix, namely closer to the verb stem, than directional seems to stem from examples in two languages of Papua New Guinea: Yimas and Kewa (Foley & Van Valin, 1984: 212). In Kewa the perfective aspect suffix appears to sit closer to the verb stem 'cook' than the directional, glossed here as 'down' (14).

(14) *Kewa (Nuclear Trans New Guinea)*
íra-pa-niaa-ru
cook-PRF-down-1SG.PST
'I burned it downward (as a hill).'
(Adapted from Foley & Van Valin, 1984: 212)

However, it seems that this example has been misanalysed. The sentence in the original work is reproduced here as (14'), where *Pa* stands for 'past tense' and *alo* for 'altocentric'.

(14') íra + -niaa + 1sg Pa alo = íra-niaa-ru 'I burned it downward' (as a hill)
(Franklin, 1971: 50)

The intrusion of *-pa-* in (14) seems to represent confusion with the explanation of *-ru*, which is the set II suffix marker for 1sg past tense. Not being a genuine piece of verbal morphology, *-pa* should therefore not be included in the example. The suffix *-niaa*, together with its counterpart *-saa* 'upward motion', "function as directional aspects" (Franklin, 1971: 50) in this position. Consequently (14) is not an exception to the directional-first rule we have identified, but rather an additional example thereof. Echoing these principles, Muysken (1986: 631) notes that "morphological processes that have the semantic function of deriving words are found closer to the lexical nucleus than processes that function to relate a word to its syntactic context" (see also Fortescue, 1980 for a similar explanation phrased in terms of direct scope).

Only two languages in our sample appear superficially to deviate from the models already presented, although ultimately they also o not constitute exceptions.

In Eastern Pomo either the punctual aspect or the reflexive voice suffix can occupy the first position slot after the verb stem, followed by either the extentive plural or the locative of attachment (McLendon, 1975; see (15) where only the locative of attachment is present), before the third-position causative. However given that the first slot may indeed be filled by a voice suffix, this is not a strong argument against the valency-first models. Moreover, where variation in suffix ordering occurs, they can be accounted for in terms of grammatical and/or extra-grammatical principles in most cases (Manova & Aronoff, 2010).

(15) *Eastern Pomo (Pomoan)*

mí há xáp^{h}u-sìt-**ʔwà**-qayeqa

you I water-sprinkle-**LOC**-CAUS

'I'm going to sprinkle water on you.'

(Adapted from McLendon, 1975: 82)

In Takelma, a set of petrified suffixes relating to transitivity and aspect can occupy the first slot after the verb stem, with voice/valency occupying the second. However, despite Sapir's insistence that these elements constitute separate suffixes, he also admits that their individual semantics can be difficult to detect (Sapir, 1922: 118). With no strong influence on semantics or argument structure, it is hard to defend the position that they are indeed independent suffixes.

In sum, then, it seems that all the languages in this sample follow the universal principles of affix ordering proposed by both Bybee (1985) and, perhaps more appropriately for languages with location and/or direction suffixes, Foley and Van Valin (1984). Variation in the relative ordering of certain suffixes, predominantly in the voice and valency set can be explained largely in terms of semantic scope (but see Caballero, 2010 for a discussion of the role of morphological and phonological ordering principles in Choguita Raramuri). As such, the key question that emerges now is: what can any of this tell us about the proposed relation between Purepecha and Quechua, and between the former and another sampled language of the Americas with a similar verb template, such as Aymara? The answer is clear: not a great deal.

There is simply insufficient independent evidence in the structure of the verb to be able to suggest a relationship between these languages other than chance. Universal principles of affix ordering are clearly at work, which in turn may mask any possible deep-time relationship. It would be worthwhile, therefore, to concentrate on other structural features in any future studies, if one still wishes to pursue the notion that Purepecha and Quechua (or Purepecha and another language) could be related in some way. Alternatively, it may be that the observable parallels in affix ordering are exaggerating the similarity between the languages, meaning that in fact the search for other structural similarities would be ultimately fruitless.

2.7. Concluding remarks

Despite certain indications from archaeology and genetics to the contrary, I have found no evidence in the basic lexicon and verb structure that would support a relationship of either inheritance or convergence between Purepecha and Quechua, or any other language included in the classification proposals of Swadesh and Greenberg. The conflicting signals from different disciplines should not come as a surprise, however, since the rate of change for the three types of data varies considerably, as do dating techniques and methods for drawing comparisons. One could also argue that the signals are not in fact conflicting, but that certain domains may be able to demonstrate connections or interactions at deeper time depths better than others. Linguistics, for example, will always struggle to adequately demonstrate deep-time relationships in the absence a long history of written sources (although recall the relative strength of structural features to indicate relatedness discussed in Section 2.5), problems that do not apply equally to well-preserved archaeological findings or DNA signatures. Moreover, where contact does occur between groups, we should not necessarily expect linguistic convergence effects to occur by default (see Bellamy (in press) for a discussion of limited role of language in technology transmission in the Americas). However it is clear that interdisciplinary connections need to be strengthened, and data from one discipline should be evaluated more critically before being cited as support for a theory in another.

Nonetheless, while the main result - that Purepecha is still an isolate - may seem dissatisfactory to some, I contend that it also demonstrates the applicability of an underused quantitative method, as well as opening the door to more fruitful avenues of research. I have demonstrated how the Oswalt Monte Carlo Shift Test can be used to test existing hypotheses of relatedness (here with negative results), but it should also be noted that it can be used to more speculatively identify possible relationships that can then be explored qualitatively in the case of positive results (see List, Greenhill & Gray, 2017 for a discussion of the most appropriate tools for different hypotheses and types of data).

The analysis of the Purepecha verb template is by necessity brief and leaves much to be explored, with the possibility of doing so from different theoretical perspectives. By showing that Purepecha generally fits into existing cross-linguistic patterns of affix ordering, I have provided further support for these universalist models whilst underlining the importance of the early placement of location and direction morphemes as core nuclear operators. In order to better understand how these patterns emerge, I suggest that emphasis should be placed on the analysis of language-internal word formation and grammaticalisation processes (see, e.g. Emlen, 2017 for such an approach to the Quechuan languages). Only once we understand the individual pathways that languages have taken can we begin to elaborate a more accurate comparative model.