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For my parents, all three of them

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A final note on the use of Red Dwarf quotes at the start of every chapter. For almost every situation in my life, there is scene or line from Red Dwarf that reflects

it perfectly. This thesis is no exception. By using them, I can also pay tribute to a great friend, no longer with us, who shared my love for the programme and its fantastic one-liners. Since we will never again be able to sit down and watch our favourite episodes together, I include these opening quotes as a dedication to him. Smoke me a kipper, Gregg.

Abbreviations

1	1st person
1/2	1st or 2nd person
2	2nd person
3	3rd person
ACC	accusative
ADJ	adjectival
ADT	agent
ADV	adverbial
ANTIP	antipassive
AOR	aorist
APPLIC	applicative
ASS	assertive
BCE	Before Common Era
C	consonant
CAUS	causative
CE	Common Era
CL	classifier
COM	comitative
DECL	declarative
DEM	demonstrative
DES	desiderative
DIR	directional
GEN	genitive
HAB	habitual
HES	hesitation
IMP	imperative
INC	inchoative
INDF	indefinite

IRR	irrealis
IT	iterative
IW	inward
LOC	locative
MASC	masculine
MID	middle voice
MOTP	purposive motion
NCR	non-co-referential
NEG	negative
NF	non-finite
NMZR	nominaliser
NUM	numeral
O	object
OBJ	objective
PASS	passive
PL	plural
POSS	possessive
PRED	predicativisor
PRES	present
PRF	perfective
PROG	progressive
PST	past
PTCP	participle
RD	reduplication
REC	reciprocal
RECPAST	recent past
REFL	reflexive
REP	repetitive
S	subject
SF	stem formative
SBJV	subjunctive

SG	singular
SP	spatial
SUBR	subordinator
TEMP	temporal
TRF	transferred action
V	vowel/verb
VAL	valency
VCE	voice
VERT	vertical

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1. INTRODUCTION[1]

"Look face it, man, it just isn't possible to fry an egg using a bicycle-powered hairdryer."
(Lister to Cat, 'White Hole')

1.1. Introductory remarks, or trying to solve an unsolvable puzzle

People love puzzles: sudokus, cryptic crosswords and murder mystery stories all satisfy our desire to solve increasingly complex problems. We are able to extrapolate from the snippets of information offered to us, applying a familiar, set formula or method to find the correct number for a given cell or the answer to seven across. It is also often possible to solve murder mystery stories before reaching the final denouement; this requires a certain familiarity with the formula used by a particular author or director, and an ability to spot the clues laid out as the story unfolds. We can all be our own armchair detectives with a bit of practice. Yet there is a common thread running through each type of puzzle: their inherent solvability. While the toughest sudoku or most complex cryptic crossword may be infuriating at its zenith, importantly it will always be solvable; we can always find the correct answer, as long as our method and powers of deduction are up to the task. Indeed the best puzzles leave you with some kind of universal insight.[2]

But not all puzzles possess this solvability feature; some refuse to play by the rules and thus will remain forever unsolvable, even if we apply appropriate and exacting methods to them. Language isolates are an example of such a disobedient puzzle: despite (in the case of some languages at least) years of attempts at classifying them into one or another language family through a more or less strict application of the Comparative Method (see Chapter 2). The key difference here between the type

[1] Parts of this chapter appear, in considerably abbreviated form, in: Bellamy, Kate & Cynthia Groff. In press. Mother-Tongue Instruction and Biliteracy Development in P'urhepecha. In: Ari Sherris & Joy Peyton (eds.), Early Writing in Indigenous Languages, London: Routledge.
[2] I attribute this final statement to the mathematician, puzzle developer and philosopher, Alex Bellos, speaking on the Midweek programme on BBC Radio 4, 16/11/2016.

of puzzles that we can solve and those we cannot is the data upon which their solution is founded. In the case of the sudoku or the cryptic crossword, the clues are available to us, we simply need the appropriate deductive abilities and experience to be able to reach an answer. In the case of language isolates, however, we may lack many pieces of the puzzle, pieces that are vital for reaching our ultimate goal, namely identifying the linguistic relatives of these genealogical outcasts. The evidence required to be able to identify the linguistic relatives of a language isolate is manifold and can be provided by various disciplines: archaeology, history, genetics, anthropology, and, of course, linguistics. Ideally we would draw on diachronic and synchronic sources, notably grammars, dictionaries and written texts of various types, reaching as far back as possible in order to be able to track the evolution of the lexicon and grammar.

If a puzzle is inherently unsolvable then we must concede that its answer is fundamentally unknowable. This is a hugely dissatisfying state of affairs. Yet, rather than dampen our enthusiasm for the problem, its difficulty may spur us on to ever more fantastic and concerted efforts to reach a conclusion. If an answer is reachable in so many cases, then why not this one? The answer is simple and merits repeating: evidence. Without the necessary evidence for a given state of affairs, the puzzle will reach a natural and ultimately untraversable impasse. So even if we know how to solve a puzzle, such as that of the 'deviant' language isolate, the method may never allow us to reach the desired conclusion, namely of genetic relatedness with a larger language grouping, since the evidence is lacking. Or looked at from the opposite angle, the lack of evidence may never allow us to apply the appropriate methods, thereby leaving the solution nothing more than a pipedream.

Purepecha[3] is one of historical linguistics' great puzzles. As we will see in Chapter 2, over 150 years of philological and comparative study has failed to identify a likely genealogical relative for the language. It should come as no surprise to the reader, therefore, that this thesis does not offer a new classification. Yet simply

[3] Many spellings exist for the language, including (but not limited to) P'urhepecha, P'orhepecha, Porhé, and Purépecha. I follow Chamoreau (2017, in press, 2016) in using the orthographically simplest form; the accent is omitted since stress generally falls on the second syllable of the root and therefore does not need to be written. The language was also known as Tarascan or *tarasco* in older literature as well as to refer to the language and people prior to contact with the Spanish. I use this older term, in line with common usage, to refer to the people in the prehispanic period, particularly in relation to their State or Empire.

because the genealogical question is intractable does not mean that other, orthogonal questions should not be investigated, nor that the historical and prehistorical language situations are even clearly defined. On the contrary, no language exists in a vacuum; language communities interact with each other over time and space, potentially leading to various contact phenomena in both language (i.e. lexicon, morphosyntax and semantics) and material culture (e.g. ceramics, textiles, rituals). New evidence for such interaction, or lack thereof, can help to reconstruct (parts of) the prehistory of a language, its development, as well as its (evolving) social setting. This evidence may allow us to speculate on migration patterns and, perhaps even, origins. Moreover, detailed language-internal investigation will offer new insights into this areally unusual language.

In order to contextualise the thesis that follows, in this introductory chapter I introduce the enigmatic Purepecha language (Section 1.2) and the history of its eponymous people (Section 1.3). In Section 1.4, I review previous research on the language, while Section 1.5 constitutes a more in-depth presentation of Purepecha grammar. Section 1.6 discusses both historical and contemporary revitalisation efforts, and is followed by a brief overview of the data sources consulted and the field site where some of those data were collected (Section 1.7). In Section 1.8, I present the research questions that underpin this thesis (and which have already been touched on in this brief introductory analogy) and wrap up with an overview of the rest of the thesis in Section 1.9.

1.2. Introduction to Purepecha

Purepecha is spoken by around 125,000 people (INEGI, 2010), mostly in the northwest of the state of Michoacán in the central highlands of Mexico.[4] Purepecha speakers can be found in four roughly contiguous regions in Michoacán (see Figure 1), with the following population distribution: Zacapu (5.2% of speakers), Lake Pátzcuaro basin (17.8%), *Cañada de los Once Pueblos* 'Valley of the Eleven Villages'

[4] Simons and Fennig (2017) estimate a further 15,000 speakers in other parts of Mexico, predominantly in the capital: Mexico City.

or *Eraxamani*[5] in Purepecha (14.7%), and the *Sierra* or *meseta tarasca* (62.3%; Chamoreau, 2012: 39). In addition at least 15,000 diaspora speakers are living in the USA, specifically in the states of Alabama, California, Illinois, Missouri and North Carolina; here the language status is classified as 6b (Threatened) on the Expanded Graded Intergenerational Disruption Scale of language endangerment (Simons & Fennig, 2017). In these cases, the language is considered to be 'in trouble' since intergenerational transmission is breaking down, even if the current child-bearing generation is still able to use the language.

[5] In line with common conventions, the orthography used in this thesis is largely phonemic, with the following idiosyncrasies (which also form part of the popular alphabet): <x> = [ʃ], <j> = [x], <rh> = [ɽ], <nh> = [ŋ], <kw> = [k^w], <y> = [j], <ï> = [ɨ], <'> = aspiration. Stops following nasals are written as voiceless even though they are voiced in the spoken language.

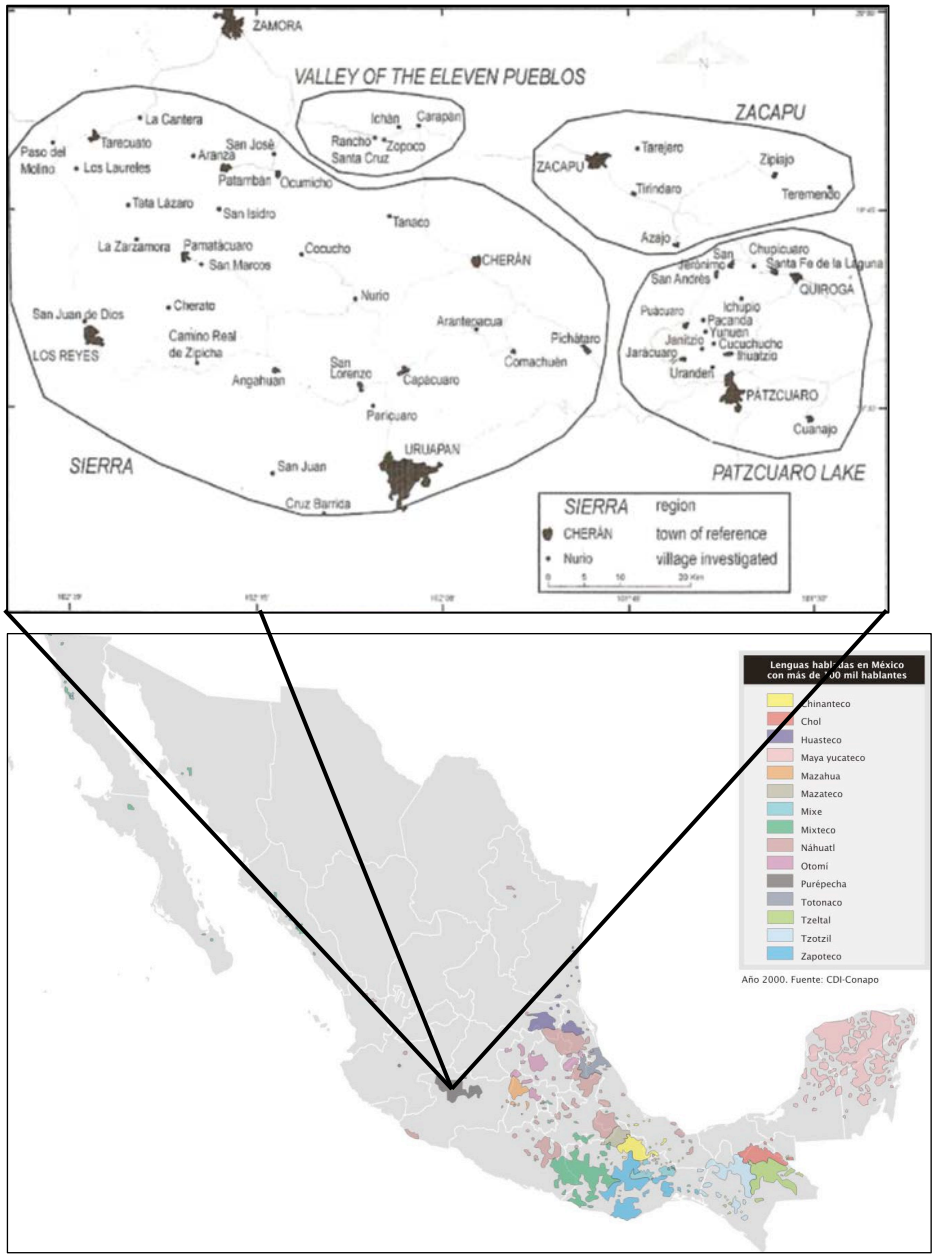

Figure 1: Purepecha speaking regions in Michoacán, Mexico (adapted from Chamoreau, 2012: 39). Note the location of Carapan in the Valley of the Eleven Pueblos.

Prior to the arrival of the Spaniards to modern-day Mexico in 1519, it is estimated that the population of the Tarascan State (covering the modern-day state of Michoacán, plus small parts of what are now Colima, Guanajuato, Guerrero and Jalisco) was fairly high, although estimates range from 280,000 to 750,000, or perhaps even 1.3 million people (Kemper & Adkins, 2015: 21; Pollard, 2015: 93, 1993: 32). Populations diminished quickly following contact; on the basis of the *suma de visitas* 'censuses' conducted by the Spanish, on the basis of figures collected between 1548 and 1579 Gerhard (1993 [1972]) estimates only around 65,000 'Indians' living in predominantly Purepecha-speaking *provincias* in the mid-sixteenth century. However, not all of these individuals would have spoken Purepecha and it is likely that at least some would have been bilingual or multilingual (but see Chapter 4 for a discussion of assumed prehispanic multilingualism).

The contemporary language situation is a predominantly bilingual one, with 90%[6] of speakers also fully competent in Spanish (Chamoreau, 2000: 13), although it is likely now that this figure is even higher, if not at the level of complete societal bilingualism. Spanish was introduced by the *conquistadores* in the early sixteenth century and now, as the national, dominant language of Mexico, it is the language of education, media, religion, administration, business, employment – all prestige domains (Chamoreau, 2007). According to Ethnologue (Simons & Fennig, 2017) the language status of Purepecha is considered to be EGIDS level 5 (developing). This means that "[t]he language is in vigorous use, with literature in a standardized form being used by some though this is not yet widespread or sustainable". That said, only 28% of children aged five to 14 are proficient in the language, indicating a disconnect in transmission from parents to children and an increasing number of monolingual Spanish speakers in formerly Purepecha-dominant areas (Chamoreau, 2000: 14). Rapid language shift to (monolingual) Spanish in a matter of two or three generations is therefore a reality that needs to be confronted.

[6] This figure is in line with the national average for monolingualism in Mexico, which sits at 9.8% (López, 2009: 4). Personal experience and discussions with speakers suggest, however, that this figure is somewhat inflated.

1.3. History of the Purepecha People

In their introduction to the English translation of the *Relación de Michoacán*, the first written history pertaining to the Purepecha people dating to around 1541, the editors claim that "[t]he origin of the Tarascans remains another enigma of ancient Mexico" (Craine & Reindorp, 1970: vii-viii). As a language isolate (see Chapter 2), peripheral member of the Mesoamerican linguistic area (see especially Chapter 4), and somewhat divergent culture in Mesoamerican terms, the origins and social development of the Purepecha continue to interest archaeologists, historians and linguists alike.

In this section I concentrate on the prehistory and early colonial history of peoples inhabiting the geographical area known as the contemporary state of Michoacán de Ocampo, currently home to the majority of Purepecha speakers.[7] It should be noted, however, that this focus is determined on a socio-political basis. Michoacán itself does not constitute a geographic or geomorphic region with naturally circumscribed limits, rather it was created as a historical and political construct in the Late Postclassic period,[8] with the emergence of the Tarascan State (Ugarte, 1962: 13; however, see Castro Gutiérrez (2015) for an opposing position). As such its value as an area of investigation in early prehispanic times may be more limited. Nonetheless, and especially given the observed continuity between archaeological phases (see, e.g., Carot, 2005), I take it as a starting point for the sections that follow.

1.3.1. Early cultures in Michoacán

The earliest occupation of modern-day Michoacán dates back to the Archaic period. Maize pollen from sediment cores dating to 1500 BCE indicates that the region was first inhabited by sedentary or semi-sedentary agriculturalists (Pollard, 2015: 94). In the Early Preclassic, localised agriculture-based villages emerged, whose terrestrial

[7] The name Michoacán means 'place of the masters of the fish' in Nahuatl, from *michhuah* 'possessor of fish, person from Michoacán' and *-cān* 'at some place, time, point' (Karttunen, 1983). Fishing was, and continues to be, an important activity in the Lake Pátzcuaro basin, the geopolitical core of the Tarascan State.

[8] Following Coe & Koontz (2008: 236) for Mesoamerica, the dates of the archaeological periods cited are as follows: Archaic (before 1800 BCE), Early Preclassic (1800-1200 BCE), Middle Preclassic (1200-400 BCE), Late Preclassic (400 BCE-150 CE), Early Classic (150-600 CE), Late Classic (600-900 CE), Early Post-classic (900-1200 CE), Late Post-Classic (1200-1521 CE).

and coastal interaction is evidenced in local pottery styles (e.g. Toby Evans, 2004: 213; Gorenstein, 2000). However, even though diversity characterised the region until the emergence of the Tarascan State in the second millennium CE, cultural continuity is observable from the Middle Preclassic period for central and centre-north Michoacán, locations that were to become key in the formation of the Tarascan State (see Section 1.2.2). Of the three cultures said to have been residing in Michoacán during this period, it is the Chupícuaro of the north and central zones, whose communities were found on islands in marshes or on lake and river shores, that is identified as the beginning of a distinguishable Purepecha cultural tradition (Pollard, 2015: 93; Carot, 2005).[9] The Chupícuaro and subsequent phases are presented in Table 1.

Period	Local phase	Dates (approximate)
Late Postclassic	Tariacuri	1350 - 1525 CE
Middle Postclassic	Late Urichu	1000/1100 - 1350 CE
Early Postclassic	Early Urichu	900 - 1000/1100 CE
Epiclassic	Lupe - La Joya	600/700 - 900 CE
Middle Classic	Jaracuaro	500 - 600/700 CE
Early Classic	Loma Alta 3	350 - 550 CE
Late/Terminal Preclassic	Loma Alta 1 & 2	150 BCE - 350 CE
Middle Preclassic	Chupicuaro	500 - 150 BCE

Table 1: Occupation phases of Central Michoacán (based on Pollard, 2015: 94)[10]

Long-distance interaction within Mesoamerica and further afield can also be traced back to the earliest period (Weigand, 2001). Exchange is documented with the Hohokam culture of the southwest USA in the form of similarities in iconography, ceramic designs and architectural features (e.g. Carot & Hers, 2008; Braniff, 1995;

[9] The other two cultures are Chumbícuaro in the Tepalcatepec Basin in the southwest, and the Balsas-Mezcala culture of the central Balsas in the south, both of which constituted small-scale agrarian societies.
[10] See Carot (2000) for an overview of the occupation phases of centre-north Michoacán, whose phases differ slightly from the Early Classic onwards.

see also Chapter 2 for an overview of possible linguistic relations in the southwest USA).

In the Classic period a major cultural transformation occurred, with ceremonial centres appearing in a number of locations in Michoacán. This change may have been associated with direct contact with the Teotihuacan culture in the Basin of Mexico, as well as with other local cultures. It is possible also that an influx of Teotihuacan peoples led to the introduction of more Mesoamerican traits, such as planned mound-plaza complexes (known in Purepecha as *yakata-echa*) oriented to the cardinal directions and ball-courts (Williams, 2004). Longer-distance exchange is also evidenced in the presence of obsidian tools from north-east Michoacán and central Mexico, and pottery from central Mexico (Pollard, 2015: 95). Under influence from central Mexico, the Zacapu region in particular became more urbanised, with an overall increase in settlements. Populations also grew at defensible locations, a pattern that was to recur later during the emergence of the Tarascan State. The Santiago-Lerma river in the north and the Balsas-Tepelcatepec in the south acted as important routes of exchange, leading some scholars to also postulate long-distance maritime contact with South America from around 650 CE onwards (e.g. Hosler, 1994; Anawalt, 1992; see also Chapter 3).

However, by the Middle-Postclassic period, with the definitive collapse of the Teuchitlán tradition (a series of communities associated with certain burial sites in West Mexico that shared important Mesoamerican features, such as ball courts, but that also possessed unique type of site layout, see Toby Evans (2004: 245-249)), little direct interaction with central Mexico remained. Instead, participation in exchange was limited to regional cultures, who shared cultural traits and beliefs that would become characteristic of the Tarascan State. Specific traditions present during this time included complex metallurgy, ceramic pipes, the occupation of (later Tarascan) sacred sites, large-scale rubble-filled mounds, and petroglyphs later associated with the principal Tarascan deity of fire *Kurikaweri* 'he who emerges making fire' (e.g. Pollard, 1993).[11] I now turn to the Tarascan State.

[11] Also spelled Tirepenie Curicaueri, Curicaveri, Cuiricaveri and Curicaberi in the *Relacion de Michoacán*.

1.3.2. The Tarascan State

The formation of the Tarascan State[12] can be traced to the Middle Postclassic period, during which a number of competing small-state societies emerged in Michoacán.[13] These societies were internally stratified, some had elaborate civic and religious architecture, with local leadership and power legitimised through a complex set of beliefs (Roskamp, 2016). Ethnohistorical sources indicate population movements from the northern region around Zacapu to the Pátzcuaro Basin in the south, although these migrations are not (yet) visible in the archaeological record (Pollard, 2015: 101). One of the mixed sedentary populations that arrived in the Basin at this time was the *Wakusecha* 'eagle warriors'. According to the *Relación de Michoacán*, henceforth RM (Espejel Carbajal (ed.), 2008; de Alcalá, 1956 [1574]), the sacred history of this group, the *Wakusecha* settled amongst other local lineages, including proto-Tarascan speakers and *naguatatos*, Nahuatl speakers, who also acted as interpreters in relations with the neighbouring Aztecs (Gorenstein & Pollard, 1983: 111).[14] The RM tells how the *Wakusecha* were able to understand, albeit with difficulty, the islanders at Lake Pátzcuaro, allowing the two groups to establish relations. This purported mutual comprehension has led Carot & Hers (2008), for example, to postulate a 'leave and return' scenario, whereby the *Wakusecha* were in fact returning to their original homeland, having left after the Loma Alta phases (see Table 1) for lands further north (i.e. outside of the northern bounds of Mesoamerica). This departure may have been triggered by drought, war or starvation, and during this time in the northern areas they interacted with the Toltec Chichimec or Chalchihuites and Hohokam cultures.

The *Wakusecha* emerged as the most dominant lineage in the region now known as Michoacán through warfare and strategic marriage alliances, but it was

[12] I use the term Tarascan State (see also, e.g., Pollard, 1993; Ugarte, 1962) to refer to the political entity also known in the literature as the Tarascan Empire (e.g. Pollard, 2015, 2003; Williams, 2004; Warren, 1985) and the Tarascan Kingdom (e.g. Coe & Koontz, 2008; Warren, 1985).

[13] Recent findings from airborne mapping techniques applied in the Lake Patzcuaro basin suggest that "large urban centres with complex spatial organisation were present centuries prior to the formation of the Purepecha Empire" (Fisher et al., 2017: 129). This claim contradicts existing models of social complexity and the emergence of the Tarascan State but requires further elaboration before the existing narrative can be changed, if that is indeed necessary.

[14] *Naguatato* here is taken directly from Gorenstein & Pollard (1983) although it is likely that their orthography is a little defective. A Spanish term of Nahuatl origin, the official modern spelling is *nahuatlato* or *naguatlato* from *náhuatl* 'that sounds good' and *tlatoa* 'to speak'. See: http://dle.rae.es/?id=QDIAkgD.

under lord Tariacuri (c. 1380-1420 CE), the first *cazonci* 'chief' that this power was fully consolidated (Roskamp, 2016), thereby founding the Tarascan State.[15] Tariacuri brought the chiefdoms of Tzintzuntzan, Ihuatzio and Pátzcuaro under his control, thereby establishing a Triple Alliance, albeit a short-lived one, since it collapsed in the second half of the fifteenth century. Through a rapid process of cultural assimilation and political unification the different groups in the region converged on a Tarascan ethnicity and socio-political system, which included use of the Tarascan language and centralised autocratic rule (Gorenstein & Pollard, 1983). By the mid-1400s the Tarascans were the most formidable enemy of the Aztecs, being the only population to resist them militarily and, as such, the only other polity in the world recognised by the Aztec Gods and Moctezuma himself (Gorenstein & Pollard, 1983: 1). By the mid-fifteenth century, following the collapse of the Triple Alliance, Tzintzuntzan was the single capital of the Tarascan State, remaining the seat of the *cazonci* until 1530 when the Spanish executed the last leader, Tsintsicha Tankaxoan.[16]

Despite the clear regional dominance of the *Wakusecha*, as evidenced in other documents, such as the *relaciones geográficas*, their tradition and identity is not the only one to be recorded in extant documents (Roskamp, 2015). A different vision of the past is presented in the *Lienzo de Jucutacato*, a pictorial account from 1565 regarding the origins of the people of Jicalán (Michoacán), their settlement and first offices. This document states that Nahuatl-speaking Toltec groups with metalworking skills arrived from Veracruz in gulf southeast Mexico, passing through Central Mexico and settling in a number of locations in Michoacán (Roskamp 2005, 1998). This sacred history combines elements from history and oral tradition to support the authors' claims to ownership of mines and natural resources, offering a very different

[15] The term *cazonci* is of disputed etymology: (i) From the Nahuatl *caccoli* 'sandal', either a derisory moniker applied by the Aztecs to reflect the humble sandals worn by the Tarascan ruler when visiting Cortés for the first time in Mexico City, or an indication that the Tarascan ruler was allowed to keep his sandals on when visiting the monarch; (ii) From the Nahuatl *tsontli* '400, numerable' and *-tzin 'lord* (diminutive)', giving 'lord of innumerable houses or towns'; (iii) From the Purepecha *kats-o-n-tsi* 'shaven', interpreted as 'he with the shaven head'. Of these three, Warren (1985: 9-10) favours the third. I agree it is more likely that a group will use a non-derogatory term to auto-denominate, and will likely favour a term from their own language. The chronicler Sahagún also indicates that the Tarascans did indeed shave their heads, and had also been known as the shaven-headed ones (Warren, 1985: 10).

[16] Alternative spellings found in the RM are: Zinzicha, Tangaxoan, Zinçich.

account of the geographical origins of at least some of the people residing in the Tarascan State.

A complex tribute system, including forced labour, military assistance and payment of goods, functioned within the Tarascan State. Sumptuary goods were acquired through long-distance trade with North America, South America (see Chapter 3) and other parts of Mesoamerica, as well as through local acquisition. The Tarascans were also great artisans, known throughout Mesoamerica for their intricate sculpture, ceramics, feather work and metallurgy (see, e.g., Arriaga, 1938: 10-11). Indeed some of the earliest extractive metalworking in Mesoamerica took place in the Tarascan region. Copper was particularly important for the Tarascans in the early part of their rule, having been used for both tools and ornamental pieces. Later techniques utilised alloying processes, although during both metalworking periods emphasis was placed on the visual (i.e. colour) and sonic properties of the metal (Chapter 3; see Hosler, 1994).

In the Tarascan belief system a number of deities were venerated in addition to the main god of fire Kurikaweri 'he who emerges making fire' (Roth-Seneff, 2015: 224), including the mother goddess Kwerawaperi, and Xaratanga, the goddess of Tariaran (a place probably located to the south of Lake Zirahuén). The *cazonci* was the semi-divine, earthly representative of Kurikaweri, thus he was expected to conquer land in name of the deity, please him by burning primarily wood and incense (Roskamp, 2014), and also ensure that the community had sufficient wood to keep fires burning. Smoke also had a specific religious significance since it was the only contact between man on earth and the gods in heaven (see also Section 5.4). Bonfires were lit to signal the advent of war, after which couriers were then sent out to conscript Tarascan men to fight. The setting of these bonfires was an administrative matter and administrators were responsible for overseeing the collection of firewood (see de Alcalá, 1956 [1574]: 106). In line with the importance of fire, the *cazonci* was cremated and not buried upon his death. Yet the Tarascan State was a relatively short-lived socio-political entity, ultimately unable to resist the invading Spaniards in the third century of its existence.

1.3.3. The Colonial Period

On 23rd February 1521 the first Spanish soldier appeared at the frontier fortress of Tajimaroa, on the border between the Tarascan and Aztec States. The large size of the Tarascan State, its proximity to Mexico City, not to mention its bountiful natural and man-made riches, had not gone unnoticed by the marauding Spanish.[17] Following an initial failed attempt to establish a colony in modern-day Michoacán, Hernán Cortes (the first governor of New Spain) sent out Antonio de Caravajal to rapidly survey the region in 1523, determined to distribute the native towns to his followers as *encomiendas* (Warren, 1985: 73). Distribution was successful on this occasion and thus Spanish rule began, revolving around (i) the exploitation of these *encomiendas*, (ii) the introduction of European agriculture, and (iii) the extraction of precious metals from mines or through exerting nobles [to give away their precious goods] (Warren, 1985: 102).

After Cortés left Mexico (overland) for Honduras in October 1524, a period of unrest began. Indigenous rebellions against Spanish *encomenderos* were commonplace, the local leaders naturally not wanting to relinquish the land and power they had earned or acquired over the preceding centuries (Gerhard, 1993 [1972]: 7-8). In particular, the position of the Tarascan *cazonci* Tsintsicha-Tankaxoan was left unclear and vulnerable. Although open to the possibility of dialogue with the recent invaders, the *cazonci* was initially imprisoned in Mexico City from late December 1524 to mid-February 1525, but then freed and allowed to return to Michoacán, probably accompanied by a number of friars. He was re-imprisoned in 1526 as a means of extracting treasure from the Tarascan State. A continued struggle between the Tarascans and the Spanish ended abruptly on 14th February 1530, when the *cazonci* was executed. Some of his descendants continued to hold governing positions during the early years of Colonial rule but their power gradually waned, thereby bringing an end to the Tarascan State.

In the first two decades after the conquest, Michoacán, along with the rest of Mexico, saw a huge depopulation due to disease and forced resettlement. The

[17] Pollard (2003: 78) estimates that in 1522 the Tarascan State covered an area of around 75,000 km^2, almost 20,000 km^2 larger than modern-day Michoacán..

Tarascan population was reduced by half in the first 30 years of Spanish occupation, with many survivors taking refuge deep in the *Sierra* (West, 1948: 12). The Spanish took over formerly Tarascan State-owned mines and metalworking workshops, using local indigenous people and imported African slaves for manpower, but largely retained the sophisticated prehispanic metallurgical techniques. Yet these changes in leadership and socio-political structure, while enormous in themselves, were not the only transformations that took place in New Spain, the Spanish colony and later vice-royalty (*virreinato* in Spanish), into which the Tarascan State had been incorporated (roughly as the state of Michoacán).[18] The introduction of the Christian calendar, organised according to Christian rituals and dates, for example, profoundly changed the religious life of the Purepecha. A Franciscan order was first established in Mexico by 12 friars who arrived from Spain in 1524. Fifteen young Tarascan nobles were sent to Mexico City in June 1525 to study at the newly built Franciscan school. The *cazonci* was baptised in Mexico City in 1525, and shortly afterwards Fray Martín de Jesús (Coruña), one of the 12 founding friars, was sent to Michoacán. From Tzintzuntzan, the lacustrine site of the first church in Michoacán (a simple, rather unsuccessful structure as it happens), missionary work extended to towns further from the lake. The friars started to destroy "native idolatry", including effigies of the ancient feline god and wooden dog offerings. Polygyny, homosexuality and drunkenness were allegedly commonplace amongst the Tarascans, and hard for the friars to uproot. Following the initial turmoil caused by these incoming political and religious figures, relative stability was established in Michoacán under the episcopacy of Father Vasco de Quiroga (1538-1565), still affectionately referred to locally as *Tata Vasco* 'Uncle Vasco', and widely considered to be the true founder of Michoacán (Warren, 1985: xii).

Such was the impact of the imported political, legal and religious constructs that contemporary Purepecha communities are still largely colonial in terms of their social structure and religious practices, not to mention linguistically. However the founding of new village structures with municipal governments with clearly defined

[18] Michoacán was established as a province of New Spain by 1570 CE, although under colonial rule it was slightly larger than it is as one of the contemporary 31 Mexican states. The state capital was, and still is, Morelia (previously known as Valladolid).

territories, known as *pueblos de indios* 'Indian villages' that were required to pay tribute to the Spanish, led to various land disputes. These disputes were compounded by various subsequent land reform acts, such as President Benito Juarez's Reform Laws which began in 1856, and in some cases persist to this day (see Roskamp, 2015, 2001; Foran, 2005; Friedrich, 1970; Mendieta y Nuñez, 1940).[19]

1.4. Previous research on the language

The history of scholarship on Purepecha dates back to the early colonial period. The first grammar and dictionary were published by the Franciscan friar Maturino Gilberti in 1558 and 1559 respectively, followed shortly thereafter by a combined dictionary and grammar (*arte y diccionario*) by another Franciscan, Juan Baptista de Lagunas (2002 [1574]). A now anonymous dictionary was also compiled during the sixteenth century, a mighty tome known as the *diccionario grande* 'big dictionary' seeing as it spans more than 1500 pages, but it was only published much later under the editorship of the lifelong scholar of Purepecha history, J. Benedict Warren (Anonymous, 1991). The seventeenth century was something of a barren period in terms of scholarly work on the language; not until the early eighteenth century was Augustin friar Diego Basalenque's (1886 [1714]) posthumous grammar of the language published and even this is considered to be little more than a summary of the sixteenth century Franciscan work (Chamoreau, 2000: 8). In the nineteenth century, as interest in the language was rekindled, a steadier flow of works began to appear, in the form of Nájera's (1870 [1831]) grammar, Pimentel's (1862) article on Purepecha morphology, Léon's (1886) phonetic description, and de la Grasserie and Léon's (1896) grammar, dictionary and texts.

The modern era of linguistic inquiry into Purepecha began with the missionary Max Lathrop (see Lathrop, 2007 [1973], 1937) and the renowned American linguist Morris Swadesh, who worked on both modern and colonial Purepecha (which he referred to as *tarasco antiguo;* Swadesh, 1969). Swadesh also worked on classifying the language (along with many other languages of the

[19] It is worth noting the shocking statistic that by the start of the Mexican Revolution (1910-1920) 90% of central plateau people, including 67% of the state of Michoacán, were landless (Foran, 2005: 36).

Americas, see Swadesh, 1967, 1956) and teaching literacy through it (see Section 1.6 for a short discussion of the Tarascan Project which he directed). Chicago-based anthropologist and linguist Paul Friedrich took up the scholarly baton in the 1950s and 60s, leading to a number of influential publications in both disciplines (see Friedrich 1986, 1970 for anthropology, and Friedrich 1984, 1972, 1971 for linguistics).

Various grammars or grammatical sketches appeared in the second half of the twentieth century in English, Spanish and Purepecha (Foster, 1969; Gómez Bravo et al., 1992, 1984; Friedrich, 1984; Nansen Diaz, 1985; De Wolf, 1991, 1989, Villavicencio Zarza, 1992; Monzón García, 1997; see also the introductory chapter of Capistrán Garza, 2015). More recently, Claudine Chamoreau has published a more comprehensive grammar (Chamoreau, 2000), as well as multiple articles on various aspects of the language (e.g. Chamoreau 2017, in press, 2016, 2013, 2008, 2004, 2002a, 2002b), not to mention on recently observable contact-induced changes from Spanish (Chamoreau, 2012, 2007). She has also published a pedagogical grammar, in both Spanish (Chamoreau, 2009) and French (Chamoreau, 2003). A number of scholars, almost exclusively in Mexico, continue to expand our understanding of the language through their work on different aspects of both modern Purepecha (e.g. Capistrán Garza, 2015, 2013, 2011, 2006, 2002, 2000; Mendoza, 2016, 2007; Meneses, 2016; Monzón García, 2005, 2004, 2000, 1998, 1994; Nava & Maldonado, 2004; Vázquez Rojas Maldonado, 2013, 2012) and colonial Purepecha (Monzón García 2005, 1996; Villavicencio Zarza, 2006; Nava, 1994). In Europe the only recent publication of note was a PhD dissertation in archaeology on the external relations of the Purepecha culture from the Archaic to the present-day (Albiez-Wieck, 2011), but its linguistic content is minimal.

1.4.1. Other written sources

In addition to the academic works listed in Section 1.4, a number of other important sources offering historical insight into Purepecha language, culture and history are available. Probably the best-known colonial-period source is the mid-sixteenth century history of the *Wakusecha*, the *Relación de Michoacán* (see Section 1.3.2).

Compiled between 1540 and 1541, probably by the Franciscan Friar Jerónimo de Alcalá, it constitutes an indigenous narrative of prehispanic culture and history, as well as of the conquest and its immediate aftermath, from the perspective of Tarascan priests and nobles (Warren, 1985: 328).

One of the most challenging, but also fascinating, genres of indigenous writing is that of the primordial title. Primordial titles are documents from the seventeenth and eighteenth centuries that describe the origins of indigenous towns and their territories (Roskamp, 2015: 113). Their main purpose was to protect communal territories against invasions from neighbouring settlements and agricultural enterprises. Written by local scribes or regional specialists, they were produced primarily for an indigenous audience and were used in legal disputes. The ultimate origin of these documents is local oral tradition, and often the documents present events and personages from different periods as contemporaneous. Many such documents still exist, although the majority stem from central Mexico. For Michoacán the primordial title (or *lienzo)* of Carapan (Rubí & Altamirano, 1989; see also Section 1.7) is probably the most extensive and detailed, but those of Jucutacato (or Jicalán) and Nahuatzen have also been studied in some detail (see, e.g., Roskamp, 2015, 2001, 1998; Acosta, 1998).

Turning to Spanish-authored documents, we saw in Section 1.3.3 that, starting in 1523, Antonio de Caravajal conducted a year-long survey of Michoacán (a process that was to become standard procedure under the Spanish crown), the result of which was the production of censuses, or *relaciones geográficas*. The first relatively complete survey is the *Suma de visitas* (1548-1550), but later location-specific examples, such as those of Zirándaro and Chilchota (both from 1579), are also still in existence (see Acuña, 1987 for the full annotated texts of 18 such *relaciones* from Michoacán). Later the royal cosmographer Juan López de Velasco penned the *Geográfica y descripción universal de la Indias* 'geography and universal description of the Indias'. These documents are of particular interest to the linguist for the documentation of languages names and numbers of speakers, as well as for local settlement names and toponyms. Naturally there may also be references to languages

long since extinct, such as Pantecan and Chumbian on the Pacific coast (see Gerhard, 1993 [1972]).

The accounts or diaries of friars are also of interest, such as the *Relación de Fray Alonso Ponce* and the diary of Capuchin friar Francisco de Ajofrín (1763-1767), which is also illustrated. These documents contain evidence of linguistic diversity in toponyms and hydronyms in the region, such as settlements ending in *-tlan* 'place' or *-tepec* 'hill, mountain', both of Nahuatl origin rather than the Purepecha *-ro* and *-ato* with the same meanings. However it is to Purepecha proper that we turn to in the next section.

1.5. Language structure

Purepecha is characterised by its agglutinating structure, which relies solely on suffixation as a means of word formation. As a language isolate and peripheral member of the Mesoamerican linguistic area (Chamoreau, in press; Smith-Stark, 1994; Campbell, Kaufman & Smith-Stark, 1986), Purepecha possesses various areally non-typical features in all aspects of language structure. Its phonological inventory comprises 22 consonants and six vowels, and has no tone. The minimal syllable contains one vowel and maximally up to four elements (CVCC), but the preferred syllable structure is CV. Stress can fall on the first or second syllable of the root (where it is disyllabic), with a preference for the second. There are two main word classes: nominals (comprising nouns, demonstratives, pronouns, adjectives, adverbs and numerals) and verbs. Nominal morphology is less elaborate, but both synchronic and diachronic derivational suffixes can be identified as a means of forming nouns and other nominal categories (see Chapter 6). Purepecha has seven nominal cases which, in most cases, are marked as suffixes on the noun. A moribund system of numeral classification can also be observed in the language. The Purepecha numeral system is vigesimal but has largely been replaced by the Spanish base ten system. All nominals may be predicativised using the predicativiser *-e/-i,* giving the Purepecha system considerable flexibility and apparent polyvalency.

Purepecha verbs are largely templatic, whereby the 12 slots following the root are filled strictly in one order, with no repetition of suffixes. All the slots are

never filled in one verb form, with the maximum extent reaching 7 or 8. In the TAM domain, only mood is obligatory in a finite verb. Purepecha is well-known for its extensive (up to 50) set of locative space suffixes, which occur directly after the root and contextualise an event or state in terms of corporeal or non-corporeal reference. Constituent order is generally SVO but SOV is also attested in some varieties. Purepecha generally shows nominative-accusative alignment, with a preference for dependent marking. Having introduced the language briefly here, in what follows I will outline the core phonological and morpho-syntactic features of the language.

1.5.1. Phonology

The phoneme inventory of Purepecha comprises 22 consonants and 6 vowels. There is no tone in the language. The distribution of these phonemes in terms of manner and place of articulation can be observed in Table 2 (consonants) and Table 3 (vowels).

	Labial	**Alveolar**	**Post-alveolar**	**Retroflex**	**Palatal**	**Labio-velar**	**Velar**[20]
Nasal	m	n					ŋ
Stop	p	t					k kʷ
Aspirated stop	pʰ	tʰ					kʰ kʰʷ
Fricative		s	ʃ				x
Approximant					j	w	
Rhotic		ɾ		ɽ			
Affricate		ʦ	ʧ				
Aspirated affricate		ʦʰ	ʧʰ				

Table 2: Consonant inventory of Purepecha

In some varieties [ʃ] is realised as a retroflex [ʂ]. The velar nasal [ŋ] is found only in some varieties of Purepecha, and then only in intervocalic position, while the rhotics

[20] Note that two phonemes appear in the velar stop cells, the first is a plan stop, the second a labialized stop of the same quality. They are included in the same cell for reasons of space.

[ɾ] and [ɽ] appear mostly in intervocalic contexts, and in the majority of varieties (Chamoreau, 2002a: 3).[21] However, under pressure from Spanish, the lateral [l] is starting to replace [ɽ] in many contexts, especially in the speech of under 20s whose command of the language is often more passive (see Chamoreau, 2002a: 9). Stops and affricates are voiced when they follow a homorganic nasal phoneme, e.g. *ampe* 'something, that, why' is realised as [ambe]. The aspirated consonants /pʰ tʰ kʰ tsʰ ʧʰ/ can appear word-initially, medially and after nasals (where they retain their voicelessness but lose their aspiration, see Chamoreau, 2003: 47), but in intervocalic contexts the aspiration shifts from after to before the plosive or affricate, as in *ejpu* 'head', where the <j> represents pre-aspiration ['eʰpu].

Word-initial consonant clusters are of two types. The first is stop + stop in the following combinations: /kt/, /tp/, /tk/, t'k/, /t'p/, or affricate + stop, as follows: /tsk/, /tskʷ/, /tst/, /ts'k/, /ts'kʷ/, ts'p/, /ts't/, /chp/, /chk/, ch'k/, ch'p/. Examples of such combinations include *kta* 'house', *tperi* 'fallow land', *t'kupu* 'mosquito', *tstuni* 'blackberry', and *chkari* 'wood'.[22] Dialect and individual reduction to a single stop or affricate is observable, e.g. *pu* < *tpu* 'mould', as is the introduction of an epenthetic vowel, e.g. *tukumpu* < *tkumpu* 'fir-spruce'.[23] The second type of consonant cluster is /s/ or non-affricate stop + /w/, e.g. *swanta* 'gas', *p'wa-* 'sprinkle'.

	Front	**Central**	**Back**
Close	i	ɨ	u
Mid	e		o
Open	a		

Table 3: Vowel inventory of Purepecha

[21] In the variety of Angahuan (southwest Michoacán) the retroflex tap is pronounced as a plain flap before a consonant (C. Monzón, pers. comm.).
[22] Note that this term, and others, are listed with and without aspiration in different sources. This likely reflects dialectal and individual variation.
[23] Willem Adelaar (pers. comm.) notes that this vowel may not be epenthetic, but rather could have been present diachronically and has since been reduced to a consonant cluster due to second syllable stress. This seems a reasonable hypothesis but not one that will be taken up in detail in this section, or thesis.

All the vowels can appear in all word positions except [ɨ], which only occurs in syllable-final contexts after [ʦ], [ʦʰ] and [ʃ]. Final [i] and [ɨ] are generally deleted in normal speech, giving rise to apparent consonant-final words, which are usually not permitted structurally.

Minimally, a syllable can contain one element (a vowel) and maximally up to four elements, including one vowel (Chamoreau, 2000: 42), thereby permitting the following structures: V, VC, CV, CVV, CVC, CCV, VCC, CVCC.[24] Certain restrictions exist regarding where these syllables occur in the word, for example consonant-final syllables cannot appear word-finally (see Table 4). The most common syllable structure, irrespective of position, is CV (Chamoreau, 2000: 42). Note that monosyllables are usually morphemes and, in turn, often also roots (see also Chapter 6).

Syllable structure	**Purepecha example**	**English meaning**	**Word-initial**	**Word-medial**	**Word-final**
V	a-	to eat	Y	Y	N
VC	ax-	tasty	Y	N	N
CV	ka	and	Y	Y	Y
CVV	káa-	to have care for	Y	Y	Y
CVC	tek-	to stumble	Y	Y	N
CCV	tpu[25]	mould	Y	Y	Y
VCC	ints-	to give	Y	N	N
CVCC	xuks-	to sow	Y	N	N

Table 4: Syllable structures in Purepecha and their possible positions within the word

Stress can occur on the first or second syllable the root, being more common on the second syllable in disyllabic roots. This flexibility can also give rise to semantic

[24] The final three structures are not found in all dialects (Cristina Monzón, pers. comm.).
[25] In some varieties, this form is reduced to *pu*.

contrasts, as demonstrated in the following minimal pairs: *káni-* 'much, many' vs *kaní-* 'arched, curved', *wérani* 'to go out' vs *weráni* 'to cry', and *kárani* 'to fly' vs *karáni* 'to write' (see Chamoreau 2003: 46).

1.5.2. Morphology

The genius of Purepecha, to borrow Sapir's (1921) famous phrase, lies in its strongly agglutinative nature, which enables the formation of morphologically complex words entirely through suffixation. The core element of any word is the root, which can be either mono- or disyllabic. To this root can be added a sequence of suffixes, depending on the word class and meanings to be expressed (for a more detailed description and discussion of roots and suffixes, see Chapter 5). Most roots can also be reduplicated, yielding additional meanings of, for example, intensity, repetition, or multiple distribution in time and place (Friedrich, 1984: 66).

1.5.2.1. Nominal morphology

In the nominal domain, which comprises nouns, pronouns, adjectives, adverbs and numerals (Foster, 1969: 40), the number of possible suffixes is lower than in the verbal domain. I will briefly present the main characteristics of each member of the domain in this sub-section.

Two main types of noun can be identified: derived and fused, where the latter generally represents the result of diachronic processes that are no longer productive. Let us begin with fused nouns, which are constructed from a root and suffix that are synchronically inseparable, and whose compositional meaning ranges from the relatively transparent to the seriously opaque (see, e.g. Chamoreau, 2003: 132-133; see also Chapter 6). These forms take no further nominal morphology apart from the appropriate case markers, such as the objective *-ni* or the plural marker *-cha*. Various examples of these fused nouns are presented in (1).

(1)

tsa=ki	‘lizard’
wirhi=pu	‘crown’
ekwa=tsi	‘twenty’
ata=chi	‘shawl’
wi=chu	‘dog’
sïpi=mpi	‘mosquito’
chesï=mpa	‘bark, shell’
e=p’u	‘head’
se=si	‘good, well’
ma=ru	‘some’
chk’u=rhi	‘corn leaf’
atsï=mu ‘mud’	

(Based on Foster, 1969: 87-88)

Different nominalising suffixes can provide semantic alternations, in this case in terms of shape: *xï-mpa* ‘sugar cane’, *xï-kata* ‘rind of sugar cane’. It is also possible to derive multiple nouns from one root, such as *xïkwa* ‘referring to witchcraft’ (where *-kwa* is likely a frozen nominaliser), *xïkwa-mi* ‘witch’, *xïkwa-pu* ‘spider, spiderweb’. The second noun formation strategy is transparently derivational, whereby the root directly takes a nominalising suffix, most frequently *-kwa* (*-ka* in some varieties) as in *pire-kwa* ‘song’ (from the root *pire-* ‘to sing’). The first and second types can form minimal pairs, such as *tarhe-kwa* ‘hoe’, *tarhe-ta* ‘corn, maize’ (Nava, 1994: 301). The suffix *-ri*, the third most common nominalising suffix, generally refers to an agent, as in *pire-ri* ‘singer’. Irrespective of their formation method, nouns are pluralised with the suffix *-echa, -icha or -cha* (depending on the variety), e.g. *wari* ‘woman’ vs. *waṛi-echa* ‘women’.

Historically a semantically richer and larger class numbering almost 20, Purepecha now possesses only three numeral classifiers, *icha-*, *ichu-*, and *ira-* (see Chamoreau, 2013, 1999), all of which are losing vitality. Friedrich (1971: 381-386) defines them as referring to objects that are ‘longish, saliently one-dimensional’, ‘flattish, saliently two-dimensional’, and ‘roundish, saliently three-dimensional’ respectively. When used (they are no longer obligatory), they appear after the numeral

in clauses where a numeral modifies a noun (2a), although the noun may also be omitted (2b). Capistrán Garza Bert (2000), following Friedrich (1984, 1970) and Foster (1969), includes these three terms in a wider, productive set of classificatory roots that are used in locative predicates.

(2a) ixu ja-rha-s-ti t'amu ichu-kwa
DEM be-SF-AOR-3.S.ASS four NUM.CL.flat-NMZR
ichuskuta[26]
tortilla
'Here there are four tortillas.' (Adapted from Chamoreau 2013: 52)

(2b) tsiman-ichuk=k'u
two-NUM.CL.flat=only
'Only two.' (Adapted from Chamoreau 2013: 52)

Both Friedrich (1984: 74) and Chamoreau (2009a: 163) identify seven cases in the Purepecha nominal system, which coincide in all but one instance, see Table 5. I follow Chamoreau's system, although it should be noted that the lack of agreement may stem from the different varieties from which the respective systems were elicited.

[26] Note that the first element in *ichuskuta* 'tortilla' is the 'flat' classifier -ichu.

Case	Chamoreau (2009a)	Friedrich (1984)
Nominative	-ø	-ø
Objective	-ni	-ni
Genitive	-iri	-ri
Instrumental	-mpo	-himbo[27] (some overlap with comitative)
Comitative	-nku	-(h)ingun (varies by dialect)
Locative	-ru	-rhu ('positional')
Residential	-a (also -e, -o)[28]	N/A
Vocative	N/A	Vowel lengthening (tentative)

Table 5: Case markers in Purepecha

The personal pronoun system previously only distinguished between first and second persons, in both the singular and plural, but demonstrative pronouns have been drafted in to function as third person pronouns (see Table 6). There is no differentiation for gender or animacy. Note also the occurrence of the marker of nominal plurality *-(e)cha* in the plural personal pronouns.

Person (singular)	Form	Person (plural)	Form
1	ji	1	jucha (ji+cha)
2	t'u	2	cha, t'ucha
3	ima, inte	3	ts'ïma (ts'ï+ma), imecha (ima+cha)

Table 6: Personal pronoun paradigm in Purepecha

Person marking for both subject and object is also found on the verb, generally as a second-position enclitic (Chamoreau, 2014; see Table 7 for the full paradigm and (2) for an example of its use). Note that the subject forms for 1PL and 3PL are identical, but that the object forms 2PL and 3PL are identical; note also that the 2SG subject

[27] In some varieties this suffix is still a postposition, namely *jimpo*, found frequently in the phrase *p'orhé jimpo* 'in Purepecha' (lit. 'with/using Purepecha).
[28] Cristina Monzón, pers.comm.

form re-appears as the 1SG object form rather than the 2SG object. Additionally, an applicative suffix can be introduced earlier in the verbal template (in the voice slot) to indicate a recipient, beneficiary or possessor (see Section 1.5.2.2).

Person (singular)	**Subject**	**Object**	**Person (plural)**	**Subject**	**Object**
1	-ni	-ri-ni	1	-kxï	-tsï-ni
2	-ri	-ki-ni	2	-ts'ï	-kxï-ni
3	-ø	-ø	3	-kxï	-kxï-ni

Table 7: Subject and object person marking

(2) wintsintikwa ixe-a-x-ti=kxï chiti
yesterday see-3PL.O-AOR-3.S.ASS=3PL 2SG.POSS
amigu-echa-ni
friend-PL-OBJ
'Yesterday we saw your friends/they saw your friends.'
(Adapted from Chamoreau, 2000: 64)

Example (2) also provides an instance of a possessive pronoun: *chiti* 'your'. The full paradigm of possessive pronouns can be observed in Table 8.

Singular	**Form**	**Plural**	**Form**
1	juchi(ti)	1	juchari
2	chi(ti), t'uchi	2	chari
3	iri, interi, imeri	3	tsiri, tsimiri, tsïmeri

Table 8: Possessive pronoun paradigm (see Chamoreau, 2009a: 72-73)

As well as forming part of the noun phrase, as in example (2), possessive pronouns can also function predicatively (3) where, in many dialects, they must be accompanied by what Chamoreau (in press) calls the predicativisor morpheme *-i/-e*. The

predicativisor can also be attached to other parts of speech such as nouns and demonstratives, which allows them to take verbal morphology and thus act as the predicate of a clause (Hernández Domínguez, 2016: 7).

(3)	t'u	ixe-x-ka	inki	imeri-i-x-ka
	2SG	see-AOR-1/2.ASS	DEM	3.POSS-PRED-AOR-SBJV

'You, you see that it was his/hers.' (Adapted from Chamoreau, 2000: 81)

In addition to the independent possessive pronouns, Purepecha also displays personal possessive suffixes that attach to nouns to indicate personal possession of said noun. These possessive suffixes are: *-ncha* 1st person, *-te* 2nd person, *-xkwa* 1st/2nd person, and *-empa* 3rd person, see example (4).

(4)	ni-a-ti	kta-empa-rhu
	go-IRR-3SG	house-3.POSS-LOC

'He will go to his house' (Adapted from Foster, 1969: 80)

Returning to demonstratives, we find a three-way distal contrast based on the stem *i-* in the singular: *i* 'this', *inte* 'this (distant and visible)' and *ima* 'that' (i.e. distant and not visible), and likewise in the plural: *tsï* 'these' (proximal), *tsïmi* 'these' (distant and visible), and *tsïma* 'those' (distant and not visible; see Chamoreau, 2003: 59).

Purepecha, like many other Mesoamerican languages, possesses a base 20 counting system but it has largely been replaced by the Spanish base ten system. Example (5) presents the numerals still in use in the language according to Chamoreau (2000: 85), although others are still known and understood.

(5)	1	ma	10	tempini
	2	tsimani	20	ekwatsi
	3	tanimu		
	4	t'amu		
	5	jumu		

Numerals may behave nominally, as (5a) demonstrates and is to be expected from their classification as substantives, or verbally, as in (5b), once the predicativisor (here *-i*) has been attached to the root.

(5a) tsimani-echa sapichu-i-x-ti=t'u
two-PL small-PRED-AOR-3.ASS=also
'The two [of them] are also small.' (Adapted from Chamoreau, 2000: 85)

(5b) tanimu-i-x-p-ka=kxï
three-PRED-AOR-PST-1/2.ASS=1PL
'We were three.' (Adapted from Chamoreau, 2000: 84)

The numeral *ma* 'one' can also function as an indefinite article, appearing both before (6a) and after the noun it modifies (6b).[29] There is no definite article.

(6a) ja-rha-x-ti ma achati
be-SF-AOR-3.ASS INDF man
'Once upon a time there was a man.' (Adapted from Chamoreau, 2000: 94)

(6b) p'unkwari tsipampiti ma
feather yellow INDF
'A yellow feather.'

The part of speech traditionally termed 'adjective' is not major in Purepecha. Its word class affiliation also remains unclear; whilst most researchers include it in the class of nominals (see de Wolf, 2013: 23; Chamoreau, 2000: 91-93; Foster, 1969: 40-41, 51; Gilberti, 1987 [1558]: 87), Capistrán-Garza (2013) considers adjectives, or rather 'property concepts' in the sense of Dixon (1982), to be verbal. She also notes,

[29] Generally the indefinite article precedes the noun, but in a director-matcher task I conducted to investigate code-switching in mixed Purepecha-Spanish nominal constructions, I elicited many examples of post-nominal indefinite *ma*. It remains unclear at the present time whether this placement represents a task effect or whether there is more flexibility and complexity to the article than has previously been claimed. I intend to take up this question in future research.

however, that the two so-called 'basic adjectives', *sapi-* 'small', and *tarhe-* 'big', are exceptions to this verbal affiliation. She considers these two exceptions to be nominal since they can directly modify nouns without taking further morphology, except for case marking where they agree with the noun they modify, see (7a).

(7a)	ji	u-s-ø-ka=ni	tsuntsu-ni	sapi-ni
	1SG	do-PRF-PRES-1/2.ASS=1.S	pot-OBJ	small-OBJ
	'I made the small pot'		(Adapted from Capistrán-Garza, 2013: 55)	

These 'basic adjectives' can also be predicativised with the morpheme *-i/-e*, see (7b), as we saw for numerals in examples (5a-b). Note that the predicativisor would also be required with the bare adjectival form *sapi* (see Capistrán Garza Bert, 2005: 80); as well as the form derived here with the nominalising or classifying morpheme *-chu* (see Chapter 6 for a more detailed discussion of these nominalising or classifying morphemes).

(7b)	ji	sapi-chu-i-x-ka=ni
	1	small-NMZR-PRED-AOR-1/2.ASS=1S
	'Me, I am small.'	(Adapted from Chamoreau, 2000: 139)

Other adjectives are formed from a root and an additional suffix, either *-pi/-mi/-mpi* or a 'deverbalising suffix' (De Wolf, 2013), namely *-kata*, *-pu*, or *-ri/-ti*.[30] See example (7c), where the root *chara-* takes the more frequent, suffix *-pi*, after which it takes standard verbal inflectional morphology.

[30] Here it is worth noting the similarity in the adjectivisers *-pi* and *-ri*, as noted in De Wolf's (2013) otherwise muddled analysis, and the word-final morphemes in the two 'basic' adjectives as identified by Capistrán-Garza (2013). This similarity in form may be worth further investigation from the perspectives of word formation and language development.

(7c) tiamu charha-pi-s-p-ti
metal red-MID-PRF-PST-3.ASS
'The metal had got red, was red (in the fire)
(Adapted from Capistrán-Garza, 2013: 58)[31]

It should be noted, however, that much disagreement exists as to the precise status of the suffix *-pi*. Capsitrán-Garza (2013), following Maldonado and Nava (2001), favours an inchoative reading for the roots that take formative suffixes such as *-pi* to form property concept words. Nava and Maldonado (2004) refer to this morpheme as a predicative middle (an analysis reflected in the gloss in (7c)), but have previously termed it an intransitiviser as well as a predicative suffix that gives an inchoative reading (Maldonado & Nava, 2001). Chamoreau (2000: 91-92) does not analyse the suffix separately from the whole adjective word in her short section on adjectives, although later refers to it as an "internal suffix that expresses a quality" (Chamoreau, 2000: 318, my translation). This topic clearly remains open for further investigation.

1.5.2.2. Verbal morphology

Verbal morphology in Purepecha is fabulously extensive, enabling the speaker to express (strictly in this order following the stem) locative, directional, causative, voice/valency, desiderative, adverbial, third person plural object, aspect, tense, irrealis, mood, and person and number purely through the (potentially productive) combination of suffixes (see Chamoreau, in press). Table 9 provides a schematic overview of the maximal verbal template, or what Friedrich (1984) rather underwhelmingly refers to as the 'long word'. It is worth noting that all 12 slots are not filled simultaneously, rather most words contain up to seven suffixes at most (Friedrich, 1984: 65). Note also that members of the same category cannot co-occur in the long word (see Section 2.5). Examples of verb forms with multiple derivational and inflectional suffixes can be found in, *inter alia*, (9a-b), (10a), (12).

[31] I find the inchoative analysis somewhat forced and exaggerated, especially given the prevalence of terms with basic stative semantics in the domains of colour, shape, consistency and texture in *-pi*. As such, I would prefer a simpler reading for this example, namely 'the metal was red'.

Slot	Class	Category	Specific morpheme(s)
Root	Stem	Root	700+ individual forms
1		Stem formative	Many forms, e.g. *-ti, -ka*
2	Derivational suffixes	Locative	Up to 50 suffixes[32]
3		Directional	*-pa* (centrifugal) *-pu* (centripetal)
4		Causative	*-ra /-ta /-tara*[33]
5		Voice/valency	*-kuri* (reflexive) *-p'era* (reciprocal) *-na* (passive) *-pe/-pi* (antipassive)[34] *-ku* (3.O applicative) *-chi* (1/2.O applicative)
6		Desiderative	*-keka /-ncha*
7		Adverbial	*-cha* 'early' *-ma* ' quickly' *-ntu* 'violently' *-kʰama* 'suddenly' *-ntʰa* 'repeatedley'
8	Inflectional suffixes	3PL.O	*-a*
9		Aspect	*-x/-s* (aorist) *-xa* (progressive) *-xïn/-sïn* (habitual)[35] *-xam* (continuous)
10		Tense	*-ø* (present) / *-p / -an* (past)
11		Irrealis	*-a* (irrealis) *-irin* (conditional)
12		Mood	*-ka* (1/2 assertive), *-ti* (3 assertive) *-ki /-i /-ø* (interrogative) *-ka* (subjunctive) *-ø* (SG imperative), *-e* (PL imperative) *-k'a* (exclamative)
13	Pronominal enclitics	Person and number	See Table 6

Table 9: Maximal verbal template in Purepecha (following Chamoreau, in press)

[32] Note that in the verbal templates presented by Friedrich (1984) and Monzón (2004) adverbials precede locative space morphemes. I return to these conflicting analyses in Section 2.5.1.
[33] The *-ra* form appears after simple stems (i.e. roots that directly accept inflectional suffixes), *-ta* generally occurs after a locative suffix, while the compound form *-tara* attaches to bipartite stems (Chamoreau, in press).
[34] This suffix is analysed as a middle voice suffix by, for example, Nava and Maldonado (2004).
[35] The aorist and habitual forms vary in pronunciation according to dialect variation. Both forms are found in examples in this thesis.

Verbal stem bases are the largest class of morphemes in Purepecha (Foster, 1965: 228). As indicated in Table 9, there are two kinds of verbal stems: simple (i.e. root-only), comprising only one morpheme, and bipartite, composed of two morphemes. Simple stems can be either monosyllabic or disyallabic, and take inflectional suffixes directly, as demonstrated in (8a) and (8b) respectively. Note that nouns stems can also be simple or bipartite, leading to my analysis of the root as precategorial rather than inherently verbal or nominal (see Chapter 6).

(8a) kw'i-xa-ka=ni
sleep-PROG-1/2.S.ASS=1.S
'I am sleeping.' (Adapted from Chamoreau, 2003: 82)

(8b) ewa-a-a-ka
remove-3PL.O-IRR-1/2.ASS
'I will remove them.' (Adapted from Chamoreau, in press)

Bipartite stems comprise a monosyllabic or disyllabic root and a stem formative suffix, where the root always bears the stress. The stem formative is required in order for the root to be able to take inflectional morphology, as can be observed in (8c) with the monosyllabic root *mi-*, whose semantics are complex but will be translated for the moment as 'to open' (see Section 6.1 for a detailed discussion of this root and its possible derivations), and (8d) with the disyllabic root *kachu-* 'to cut'.

(8c) mi-ti-xïn-ka=ri kara-ni
open-SF-HAB-1/2.ASS=2SG write-NF
'You know how to write.' (Adapted from Chamoreau, in press)

(8d) chkári-ni kachu-ku-pu-xa-ti
wood-OBJ cut-SF-DIR.CENTRIP-PROG-3.S.ASS
'He comes cutting the wood.' (Adapted from Chamoreau, in press)

The closed class of locative suffixes (slot 2; also termed spatial morphemes (Monzón, 2004) or suffixes of locative space (Friedrich, 1971)) provides specific, concrete (i.e. on or in the body) or abstract (i.e. not in or on the body) reference to the location of an event or action. The same suffix can refer to both concrete and abstract locations. See (9a-b), where examples with the morpheme *-ti* 'human face or front area of an object' are presented and highlighted in boldface.

(9a) ji era-**ti**-s-ka atakurhikat-echa-ni
1SG see-**SP.LOC**-AOR-1/2.ASS wound-PL-OBJ
Jwanu-ni
Juan-OBJ
'I saw wounds on Juan's face' (Adapted from Monzón, 2004: 133)

(9b) María era-**ti**-xa-ti xïranta-ni
María see-**SP.LOC**-PROG-3.ASS paper-OBJ
'Maria is looking at the paper/book' (lit. 'at the frontal surface')
(Adapted from Monzón, 2004: 133)

Directional suffixes (slot 3) can also offer specificity to an action, such as *t'ire-pa-ni* 'to eat while going along', where *-pa* marks an action performed along the way (Foster, 1969: 136).

In the TAM domain, only mood is obligatory in a finite verb, as demonstrated in (10a), although note that it is null in the case of the imperative. Aspect co-occurs with tense and mood (10b), while irrealis (also called the future tense in Chamoreau, 2000: 116-117) occurs only with mood (Chamoreau, in press), see (10c).

(10a) piri-ti
sing-3.S.ASS
'She/He sings.' (Adapted from Chamoreau, 2003: 87)

(10b) yontki wanta-na-xïn-an-ti juchari anapu
before speak-PASS-HAB-PST-3.ASS 1PL.POSS language
'Before, our language was spoken.' (Adapted from Chamoreau, 2000: 119)

(10c) ima no jonkwa-a-ti
DEM NEG return-IRR-3.ASS
'He will not come.' (Adapted from Chamoreau, 2000: 117)

1.5.3 Syntax

At the clausal level constituent order in Purepecha is generally SV(O), as in (11).

(11) S V O
María ata-a-ti Rósa-ni
María hit-IRR-3S.ASS Rósa-OBJ
'Maria will hit Rosa.' (Adapted from Capistrán-Garza, 2013: 52)

It is claimed that constituent order has shifted from being verb-final through contact first with neighbouring Nahuatl (Uto-Aztecan) and Otomí (Otomanguean) - both verb-initial languages - and later with Spanish (see Chamoreau, 2007). However, word order remains flexible to an extent, largely due to the presence of case marking, person marking on the verb and personal pronoun enclitics; see (12).[36] Detailed studies on the syntax and constituent order of different Purepecha varieties is also lacking from the contemporary descriptive literature (Chamoreau, in press).

(12) S O V
Jorgi cigarru-ni sïpi-ru-xa-p-ti
Jorge cigarette-OBJ smell-SF-PROG-PST-3S.ASS
'Jorge smelled the cigarette.'

[36] Indeed many speakers, such as those from Cheranastico and Angahuan (in the Sierra), would consider the SOV word order in (12) to be the unmarked order (C. Monzón, p.c.).

Examples (11) and (12) also highlight the nominative-accusative alignment of the language, whereby the subject of a clause is unmarked, whilst the object generally takes the objective marker *-ni*. Multiple objects - direct, indirect or oblique - can be marked with *-ni* (12a), according to hierarchies of semantic properties, grammatical features and pragmatic strategies (see Chamoreau, 2016: 86).

(12a)	celia	arhi-x-ti	inte-ni	wantantskwa-ni
	Celia	tell-AOR-3S.ASS	DEM-OBJ	story-OBJ
	puki-ni			
	Puki-OBJ			
	'Celia told Puki this story.'		(Adapted from Chamoreau, 2016: 86)	

However in instances of voice change with ditransitive verbs (i.e. in reflexive, reciprocal, passive and antipassive constructions) secundative alignment is employed (12b), meaning that the recipient of the ditransitive verb aligns with the object of the transitive verb (see Chamoreau, 2016: 8).

(12b)	tataka-icha	arhi-na-xa-ti=kxï	wantantskwa
	boy-PL	say-PASS-PROG-3S.ASS=3PL	story
	t'aletskwa-icha-iri		
	elf-PL-GEN		
	'The boys are being told the story of the elves.'		
		(Adapted from Chamoreau, in press)	

At the phrasal level, Purepecha displays a preference for dependent marking (see Chamoreau, 2017). For example, the subject and object roles are expressed by pronominal enclitics (see Table 6), and the possessor (i.e. the dependent) is marked with the genitive marker *-eri* see Chamoreau, 2016: 86), see (13).

(13) nanaka-echa-eri jawiri sesi ja-rha-x-ti
girl-PL-GEN hair very be-SF-AOR-3S.ASS
'The girls' hair is beautiful.' (Adapted from Chamoreau, in press)

Despite this preference for dependent marking, Purepecha also displays a number of head-marking characteristics, namely the 3PL.O role being expressed as an independent suffix on the verb (in slot 8, see Table 8), applicative suffixes appearing exclusively on the verb to encode recipient or possessor, and the possible lack of marking of 1SG and 3SG subjects (see Chamoreau, in press). Moreover, the presence of a number of diagnostic characteristics, including locative suffixes, some head-marking features, emergent polypersonalism and the possibility for 'word sentences', as in (14), has led Chamoreau (2017) to classify Purepecha as a polysynthetic language, somewhere on the continuum between 'sentential' and 'non-sentential'.

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

Coordinate clauses, comprising two functionally equivalent units (e.g. noun phrases, verb phrases, or clauses), are linked with the ubiquitous *ka* 'and', see (15). This coordinator can also behave more freely, linking chain-medial clauses in discourse (Chamoreau, 2016: 101).

(15) [jwanu p'ame-t'a-rha-xa-ti] ka
Juan pain-SF-LOC-PROG-3S.ASS and
[no ni-wa-ti wiri-ni]
NEG go-IRR-3S.ASS run-NF
'Juan has foot pain and will not run.' (Adapted from Monzón, 2004: 288)

Finite subordinate clauses are marked by the double presence of *-ka*, once at the beginning of the subordinate clause, attached to the subordinating conjunction, and

once at the end, attached to the main verb of the subordinate clause, where it is glossed as a subjunctive marker, see (16). The two *-ka* elements are highlighted in bold for clarity.

(16) [**eka** rosita-ri ama-mpa chem-empa
[**when** Rosita-GEN mother-3.POSS house-3.POSS
nia-nts'a-ni ja-p-**ka**] imeri tapichu
return-IT-NF be-AOR.PST-**SBJV**] 3SG.POSS uncle
no sesi ixe-pa-nts'a-s-p-ti
NEG well see-DIR-IT-AOR-PST-3S.ASS
'When Rosita's mother had returned to her house, her uncle did not see well.' (Adapted from Chamoreau, 2016: 90)

In sum, Purepecha is an areally unique language, characterised by its purely suffixing, agglutinative structure and rich derivational possibilities. Long an unwritten language, but of scholarly interest since the early sixteenth century, the future of the language is looking increasingly uncertain under the influence of Spanish through ever more pervasive communication media. In response to this situation, I now turn to language vitality and revitalisation efforts for Purepecha.

1.6. Language Vitality and Revitalisation Efforts

Purepecha has been spoken in Michoacán (and previously also in parts of neighbouring states) since well before the arrival of the Spaniards in 1521, but the language was not formally written until the publication of the first grammar and dictionary by the Franciscan friar Maturino Gilberti (1987 [1558], 1559 [1975]; see Section 1.4). The Franciscans encouraged literacy in Purepecha during the sixteenth century, with the aim of Christianising the native population, but it seems that these early practices in educational syncretism never really took hold (Hamel 2008: 313). Colonialist education policies instead focused primarily on forcibly assimilating indigenous peoples, the Purepecha included, both culturally and linguistically, through the direct imposition of Spanish (Hamel, 2013: 1). A second strategy during

this period comprised slow transitional education and a very small number of maintenance programmes (including the primary schools discussed in the present chapter), but these were very much the exception.

As such, the Tarascan Project represented a long-awaited return to native language medium education for Purepecha speakers. Directed by the renowned linguist Morris Swadesh (then employed by the Mexican Department of Indigenous Affairs), the Tarascan Project fostered literacy and language maintenance by teaching reading and writing in Purepecha, thereby also acting as a bridge for literacy in Spanish. Before launching the project, a combined team of Mexican and US linguists and anthropologists had devised a suitable, streamlined alphabet for Purepecha and set of primers for pedagogical purposes. These materials were prepared on the basis of ethnographic and descriptive linguistic investigations in a number of villages, thus taking a certain amount of dialect variation into account.

Purepecha literacy classes were taught by twenty specially selected and trained native speakers, several of whom were also taught how to use a printing press in Paracho (the town in Michoacán where the project was established) for producing additional materials, including instructional pamphlets regarding issues such as health and sanitation. Posters presenting the alphabet, as well as contrasting segments (see Figure 3), were also displayed in village squares for consultation outside of class. The project ran for just over a year, from 1939-41, and was reported as being immensely successful; following its advanced, linguistic theory-based approach, previously illiterate individuals learned to read and write in 30 to 45 days (Barrera-Vásquez, 1953: 83). The project ended abruptly in 1941 due to a change in administration, which cut the project's already limited funding, not because of a lack of support from its collaborators or director.

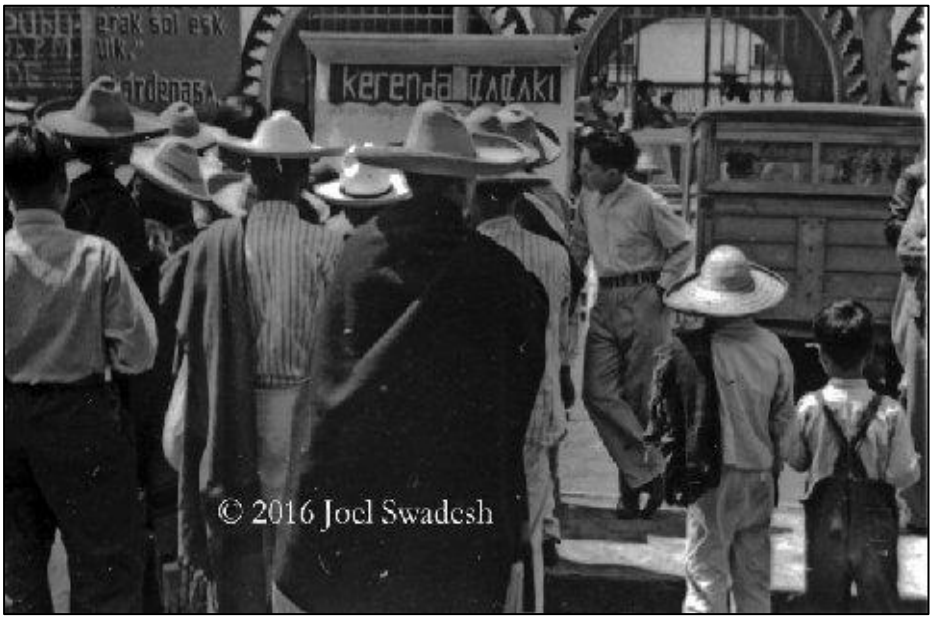

Figure 2: Example of Tarascan Project teaching material: a mural newspaper bearing the title kerenda ʧiʧʌki 'crag flower'. A younger man, probably a teacher, stands by as members of the community read local and national news. Photograph by Frances L. (Swadesh) Quintana, 1939/1940, used courtesy of Joel Swadesh.

Following the discontinuation of the Tarascan Project, literacy in Purepecha advanced little, even with the introduction of so-called bilingual and bicultural education in primary schools across Mexico in the 1970s (Hamel, 2008). This model was replaced in the 1990s by intercultural bilingual education (IBE) with the aim of preventing the development of a dichotomous worldview that the label "bicultural" implied. IBE is supposed to integrate "content matters and competencies from indigenous funds of knowledge, as well as from national programs, [and] should be integrated in a culturally and pedagogically appropriate curriculum" (Hamel, 2013: 1-2). In contrast to earlier colonialist Spanish-centred programmes, IBE should enable children to know and appropriate their own culture in their own language so that they can form

sound competencies, values, and ethnic identity (see Hamel, 2013, 2008; López, 2009 for overviews).

Yet the reality of IBE is not as positive as its aims would suggest. Most Purepecha-speaking children are not schooled in their native language first, instead they continue to work through a system of "Castillanization", where Spanish is the vehicle for literacy and content instruction. Primary schools often provide only two hours a week of instruction in Purepecha, focusing only on language acquisition, namely grammar and spelling and not on content in the native language. That said, Purepecha-medium materials have been developed for teaching the language in these bilingual schools, in the form of grammars/primers and storybooks. However, a remarkable exception to the Spanish-dominated primary education system can be found in two rural schools in San Isidro and Uringuitiro, Michoacán (Bellamy & Groff, in press; Hamel & Francis, 2006). Teachers at these two schools have made a radical return to native language instruction by developing a programme and curriculum that emphasizes Purepecha language and culture, with instruction for all subjects provided through the medium of the Purepecha from Grades 1 to 6. Such efforts are particularly important in an overall climate of decreasing parent to child transmission of the language.

Revitalization efforts are not limited to primary schools, of course, and the initiatives I mention here are not intended to be exhaustive. The *Universidad Indígena Intercultural de Michoacán* (UIIM, see http://uiim.edu.mx/index.php/quienes-somos/mision) offers a number of Bachelor-level programmes aimed primarily at indigenous students, notably the *Licenciatura* in Language and Intercultural Communication, with specialisations in intercultural communication and applied linguistics. This latter specialization is essentially a teacher training programme and therefore includes modules in Purepecha grammar, intercultural education and bilingualism, teaching methods, language acquisition and language planning, amongst others. The *Universidad Michoacana* in Morelia (the state capital) also offers Purepecha language classes, while Facebook communities such as *Hablemos Purepecha* encourage basic vocabulary learning and interest in the language through a more mobile medium. The website Purepecha.com hosts the Purepecha-medium

Radio Xiranhua, as well as information regarding language, culture and local initiatives and events (largely in Spanish), and an online Purepecha-Spanish dictionary. Local radio stations, such as *Radio Juchári Uinápekua* in Santa Fe de la Laguna, are also promoting the language to a wider audience courtesy of the modern possibilities afforded by internet-based transmission.[37]

1.7. Data and field site

The majority of the data used in this thesis is extracted from previously published and unpublished written sources: dictionaries, grammars, wordlists and archive material. My main research collaborator in Carapan, María de la Luz Rivera Rodríguez, contributed lexical data to the language contact study (Chapter 4). As such, it should be noted that the *Cañada* variant of Purepecha is the primary source for my own material, while the material cited from Chamoreau (e.g. 2000, in press) and Foster (1969) reflects Lake Pátzcuaro varieties, whereas Monzón's (e.g. Monzón, 2004) and Friedrich's (e.g. Friedrich, 1984) work is based on two rather different variants from the *Sierra*. The differences between the varieties are not huge, being largely lexical and phonological in nature, but they are a linguistic and textual reality that should be acknowledged.

In Chapter 5, where I offer a typology of smell terms in Purepecha, only a small part of the data presented originates in the written word. Spoken data were elicited from Purepecha-Spanish bilinguals aged 15 to around 50 mainly in the village of San Juan Carapan (known locally simply as Carapan), the first village in the string of settlements known as the *Cañada de los Once Pueblos* 'Valley of the Eleven Villages or *Eraxamani* in Purepecha (see Figure 1).[38] Situated at an altitude of almost 2000m above sea level, Carapan (meaning 'place where registers are kept' in Nahuatl) has a population of around 6400 people (INEGI, 2013), most of whom are Purepecha-speaking. In the municipality of Chilchota, where Carapan is located, 58% of the

[37] Note that the inconsistent use of the accent on the second syllable of the both *Juchári* and *Uinápekua*, as well as the use of <u> for /w/ is retained as this is a proper name.
[38] It can be considered the first village (rather than the last) geographically since the valley begins here, and it is here where the waters rise to form a source that was revered by the prehispanic inhabitants and according to Rubí (1989: 17) continues to be a "sanctuary of wild beauty".

32,561 people aged five and over speak an indigenous language, namely Purepecha (Kemper & Adkins, 2015: 39). This is the highest proportion of indigenous language speakers of any municipality in Michoacán, and the fifth highest in West-Central Mexico (idem.). Carapan is also well-known for having produced the most extensive and detailed set of *lienzos* 'primordial titles' in Michoacán (Roskamp, 2015: 124; see Section 1.4.1).

During the three research visits from 2014-2016, totalling nearly six months, data were also collected from speakers in other *Eraxamani* villages, namely Santo Tomás, Ichán and Zopoco, all of which are also predominantly Purepecha-speaking. The first set of 12 interviews, conducted following the Language of Perception elicitation kit (Majid, 2007), all last between 30 and 45 minutes and were conducted in Purepecha by Maria de la Luz Rivera Rodriguez. The follow-up elicitation sessions, focusing only on the language of olfaction, were conducted with 13 participants and last between 15 and 60 minutes. Both sets of recordings together total around 12.5 hours of spoken data, or just over six hours each.

1.8. Research questions

This thesis does not focus solely on the research question that it was initially intended to resolve, namely: what are the linguistic relatives of Purepecha? Given that the answer to this question has to remain 'none that we can identify from the data available to us' (see Chapter 2), other historical comparative and language internal questions come to the fore. Such a shift in focus evokes Hamp's (1977: 279) statement that "[t]here are three great categories of linguistic study that rely on the comparison of linguistic features and grammars": typology, the Comparative Method and areal linguistics. In the absence of data allowing for an application of the Comparative Method in Purepecha and one or more other purportedly related languages, typology and areal linguistics naturally have to play a more prominent role in this investigation. Moreover, when considering questions related to previous states of the language and possible historical interaction scenarios, it is necessary to have a better understanding of the linguistic processes that have led to language functioning as it currently does, in other words what processes of change (e,g. grammaticalization, semantic shift)

have produced the modern-day language. As such, this thesis seeks to also address the following research questions:

- What can linguistic data, as well as data from other disciplines (notably archaeology and genetics) tell us about prehispanic interaction between Purepecha and other languages of both Mesoamerica and South America?
- What was the nature of these contact relations, at the local (West Mexico), regional (Mesoamerica) and long-distance (South America) levels?
- Given the nature of these contact relations, how does Purepecha fit into the Mesoamerican context?
- How isolated was this isolate, linguistically, culturally and socially?
- How can language-internal processes of change inform our historical understanding of Purepecha and its position areally and genealogically?

As well as offering multiple approaches and methods to dig into the prehistoric linguistic situation, this thesis also offers a glimpse, or rather a snifter, of one element of the unique nature of Purepecha, in the form of its dedicated roots and morphological structure for smell terms (see Chapter 5). While this chapter is, in a sense, a bonus to the main theme of the dissertation, the root analysis I offer there provides an initial framework for the more detailed discussion of word formation in Chapter 6. In the next section I offer an overview of the six chapters that follow.

1.9. Thesis outline

As indicated in Section 1.8, the focus of this thesis shifts from the original research question - finding the linguistic relatives - to questions of language contact and interaction at different temporal and spatial levels, to language-internal issues of word formation and semantic specificity, all the while maintaining a common thread: the Purepecha language and its genealogical and areal standing. It should also be noted that a certain amount of repetition can be found, especially in the introduction to some of the chapters, given that they were written as individual papers and not as part of a monograph.

I open the comparative account in Chapter 2 with a deconstruction of the various proposals for classifying Purepecha and re-analyse them using both a quantitative and a more traditional comparative typological method. I begin this chapter with an overview of the classification proposals that have been put forward in the 150 years of philological interest in the language, ranging from the more conservative and well-founded to the fanciful and, frankly, absurd. I focus on the two classification proposals in particular that have drawn the most scholarly attention, albeit not for their scientific rigour or convincing results. The first of these proposals is the Macro-Quechuan family advanced by Morris Swadesh (1967, 1956), which links Quechua (Quechuan) in the Andes with Purepecha and Zuni, an isolate spoken in the southwest of the US. The second proposal (Greenberg, 1987) places Purepecha in the Chibchan grouping of the Chibchan-Paezan family, as part of the (much) wider Amerind macro-family. On the basis of extended and standardised wordlists I test these two proposals using the Monte Carlo Oswalt Shift test to see whether the "correspondences" identified by Swadesh and Greenberg stand up to statistical scrutiny, that is whether they occur more frequently than would be expected by chance. The short answer is no, they do not; previous cognate candidates were no more likely to have been identified than by chance.

Despite the lack of lexical connections, one cannot deny the structural similarities, particularly in verbal morphology, between Purepecha and Quechua (as well as other Andean languages such as Aymara and Mapuche), which could be held up as evidence for a more ancient relationship. As such, in the second half of this chapter I contrast the suffixing patterns between these two languages, situating them in the context of affix ordering in other strongly suffixing, agglutinative languages in the Americas and further afield. The results of this small-scale typological study indicate that all of these languages adhere to similar patterns of affix ordering, and that the similarities between Purepecha and Quechua represent an example of these typological tendencies. These findings also parallel earlier studies related to the relative ordering of morphemes and the preference for suffixing from the perspectives of processing (e.g. Cutler, Hawkins & Gilligan, 1985), synchronic syntactic principles (Baker, 1985), diachronic change (e.g. Lehmann, 2015), semantic relevance (e.g.

Bybee 1985), or a combination thereof (e.g. Mithun, 2000; Hall, 1988). As such, the evidence from both parts of this chapter converges on the same result: the two main classificatory proposals for Purepecha are baseless and thus should really be consigned to the waste basket of comparative linguistics. Bearing this in mind I call on scholars in other connected disciplines, such as archaeology, to evaluate such classificatory proposals with a more critical eye, and on the dyed-in-the-wool 'lumpers' in comparative linguistics to accept the isolate classification of Purepecha.

In Chapter 2 I used basic vocabulary as a means of testing relatedness proposals to show Purepecha is unique, isolated. However, no language exists in a vacuum; its speakers interact with groups speaking other languages through, *inter alia*, trade, warfare and marriage. In Chapter 3, then, I focus on the supposed transfer of a technology – metallurgy – that has been claimed to connect the Purepecha prehistorically to other metalworking cultures in South America. The motivation for this study lies predominantly in archaeology (Hosler, 1994; Anawalt, 1992) which suggests long-distance contact occurred between the Andean region of South America and West Mexico from 1500 BCE onwards. Moreover, in genetics, Brucato et al. (2015) identify the presence of a small but significant Andean component in certain Mesoamerican populations, whose correlation with proximity to an archaeological site with evidence of metalworking is highly suggestive of contact mediated by metalworking.

Therefore in this chapter I use the lexicon of metallurgy, the most robust line of archaeological evidence for interaction, to investigate the proposed contact relations between West Mexico and the Andean region. On the basis of a specialised wordlist for over 100 languages, I find no clear evidence of contact, other than borrowings at the more local level, especially in the Andes. The reason for this absence of loans may lie in the nature of knowledge transmission which, in both technical and everyday situations, especially in non-industrialised contexts, relies more on the non-verbal than the verbal. The use of existing terms to name metals and new metal objects, as well as shared naming strategies based largely on colours and physical properties, underlines both the cultural continuity inherent in the adoption of a new technology as well as the diversity stemming from multiple local adaptations.

There may also be a case for independent innovation of metallurgy, up to now a rather unpopular position (but see García Zaldúa, 2016; Schulze, 2008).

In Chapter 4, I begin by bringing together the findings of Chapters 2 and 3, using them as a springboard for probing the various questions that their negative results have raised. On the basis of lexical data collected specifically for this project and other sources, I dig deeper into the issue of prehispanic multilingualism in Michoacán, reviewing what is known of cultural and linguistic diversity in this period on the basis of archaeological findings and colonial census reports. I then present a three-way spatial typology of language contact scenarios for Purepecha, focussing in on the long-distance (i.e. South America), medium-distance (i.e. Mesoamerica) and regional (Michoacán and immediate surroundings) contact scenarios. Next I consider the differences in language contact effects over time in, offering examples of lexical and structural borrowing in Purepecha from Spanish in the modern language. Possible socio-political explanations for the patterns observed are then presented.

Having established, using different methods and different types of data, that Purepecha cannot be convincingly (or even unconvincingly) related to another language, and that it exhibits very few demonstrable signs of contact in the prehispanic period, in Chapter 5 I move on to a specific language-internal issue, namely olfactory language. I present a typology of terms for talking about smells in Purepecha. Through a number of elicitation techniques I have gathered data on olfactory language in Purepecha that indicates three ways of talking about how something smells. Comprising 15 terms, the first is the "basic" type (see Berlin & Kay, 1969), whereby a dedicated 'smell root' is duplicated and then extended with the "spatial couplet" morphology (Friedrich, 1971) of two locative space suffixes *-jk'u* 'manual' and *-nti* 'ear, shoulder'. This combination of root and suffixes then combines with inflectional suffixes of TAM, person and number to provide a range of odour meaning whose referents are not related in terms of either form or function to the smell term. Of these basic terms, all but one refer to negative odours. The second type of smell term can be labelled "descriptive"; these terms comprise a root with a transparent meaning such as *te-* 'sweet' and the spatial couplet morphology of the basic terms, to indicate that something has been smelled rather than apprehended in

another manner (e.g. tasted). The third type is source-based, namely a generic verb meaning 'to smell' is combined with the source of the smell (e.g. fire, wood), usually in the objective case. Nonetheless, the observed propensity for negative hedonic smell terms in Purepecha supports the notion that foul odours are more consciously salient than pleasant ones (Lee, 2010: 115). As well as offering this preliminary typology of smell terms, I also discuss the role of smell from a historical perspective, drawing on references to odours of smoke and incense, and their role in Tarascan religious life.

Building on the proposal put forward in Chapter 5 that smell roots would be better conceived of as more abstract concepts in terms such as √PERCEIVED FOULNESS, in Chapter 6 I investigate the relative roles and semantic contributions in word formation processes of the two main morphological units in Purepecha: roots and suffixes. Roots can be derived to form nouns, verbs and other minor word classes, but their independent meaning ranges from highly transparent to seriously opaque. I investigate the role of suffixes in the 650 synchronically fused nouns (see Section 1.5.2.1) drawn from Friedrich's (unpublished) Purepecha-English dictionary as a means of identifying the relative semantic contribution of both roots and suffixes in the language. I discuss the possible classificatory role of the 56 nominalising suffixes identified, focusing on the semantics of a sub-set in order to demonstrate their variability in sematic transparency as well as their possible polyvalence. Through a comparative presentation of nominal classifiers and fused classifier prefixes in four Otomanguean languages, I offer a tentative diachronic pathway for the grammaticalisation of these suffixes in Purepecha. Nonetheless I underline that the lexical origin of most of these 'nominalising' suffixes remains unclear, leaving the way open for a great deal more research into diachronic processes of word formation and the construction of meaning in Purepecha. In addition, I expand on the possibly controversial idea that Purepecha roots could be precategorial, through a critical analysis of existing verb and root accounts for the language. To this end I suggest that they could be conceptualised in terms such as the aforementioned PERCEIVED FOULNESS or RELATED TO BURNING, depending on their semantic transparency, and rather than as simple translations such as 'to stink' or 'to burn' respectively.

The thesis concludes in Chapter 7 with a discussion, including a reflection on the methods used in this thesis and how to deal with their sometimes conflicting findings. It also serves as a call for more language internal work on Purepecha, and other isolates, in order to be able to carry out more accurate and detailed comparative work, if indeed such work is necessary and worthwhile. It also offers a number of possible routes for future research.

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	sɨ-k^{w}íri	qara	¢^{ʔ}ikk^{w}a
blood	yulí-ri	yawar	
grease	tepári	tika	
horn	sɨ-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-	waña-	
kill	wán-ti-ku-	waña-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 *sɨ-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.

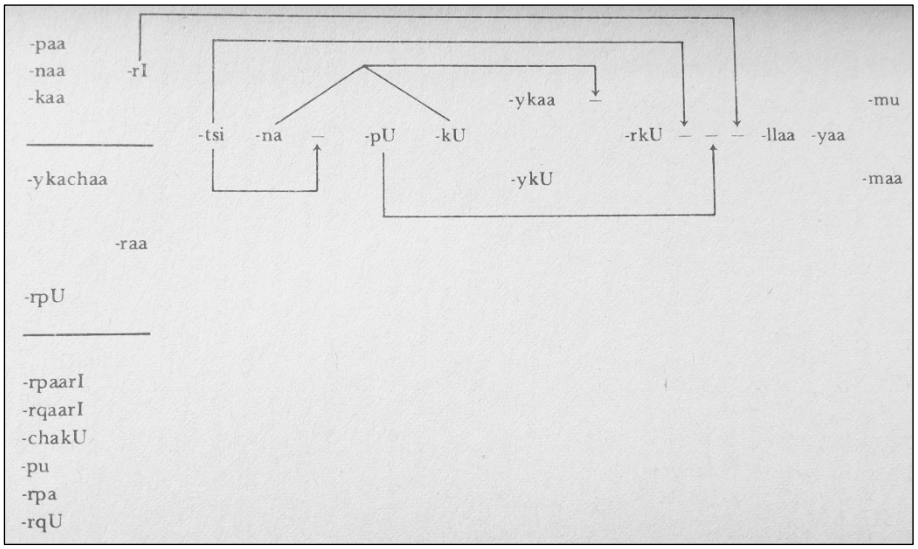

Figure 3: Affix ordering in Ancash-Huailas Quechua (Parker, 1976: 132)

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.

3. INVESTIGATING LONG DISTANCE CONTACT[63]

"Mayday, Mayday! I wonder why they call it "Mayday"? It's only a bank holiday. Why not "Shrove Tuesday", or "Ascension Sunday"? Ascension Sunday, Ascension Sunday! Second Wednesday after Pentecost, Second Wednesday after Pentecost!"
(Rimmer to whomever may be listening, 'Marooned')

Abstract

Findings from archaeology and genetics suggest long-distance interaction occurred between peoples of the Andean region of South America and West Mexico from the Formative period through to the Late Postclassic (see Chapter 1, Table 1). Previous studies in linguistics, however, have focussed on possible genealogical relations rather than traces of contact, offering little substantial support for the former. In this paper I use the lexicon of metallurgy, the most robust line of archaeological evidence for interaction, in order to investigate the proposed contact relations between the two regions. On the basis of a specialised wordlist for over 100 languages, I find no clear evidence of contact, other than borrowings at the more local level, especially in the Andes. The reason for this absence of loans may lie in the nature of knowledge transmission which, in both technical and everyday situations, especially in non-industrialised contexts, relies more on the non-verbal than the verbal. The use of existing terms for metals and new metal objects, as well as shared naming strategies based largely on colours and physical properties, underlines both the cultural continuity inherent in the adoption of a new technology as well as the diversity stemming from multiple local adaptations.

3.1. Introduction

Scholars in several disciplines have suggested the existence of long-distance interaction between peoples in the Andean region of South America and West Mexico

[63] A slightly adapted version of this paper appears as: Bellamy, Kate. In press. Investigating interaction between South America and West Mexico through the lexicon of metallurgy. In: Guus Kroonen & Rune Iversen (eds.), British Archaeological Reports International, Special Issue 'Digging for Words'.

from the Formative period to the Late Postclassic.[64] In archaeology, the evidence for this contact includes similarities in weaving techniques and clothing styles (Anawalt, 1992), shaft tombs and their funerary offerings (Albiez-Wieck, 2011: 405), certain pottery styles (Coe & Koontz, 2008: 48), and metallurgical techniques and objects (Hosler, 2009, 1994; Gorenstein & Pollard, 1983). Recent findings in genetics (Brucato et al., 2015) indicate the presence of a small but significant Andean component in certain Mesoamerican populations, also suggesting contact between the two regions. In linguistics, Swadesh's (1967) proposed genealogical link between Purépecha in West Mexico and Quechua in the Andes has been largely discredited (Campbell, 1997), but does continue to hold sway in some, less mainstream, circles (e.g. Sánchez Diaz, 1999).

Of the different types of evidence offered for this long-distance interaction, metallurgy is the most convincing. While the origins of extractive metallurgy continue to be debated, it is clear that it evolved independently in more than one place worldwide (Radivojević et al., 2010: 2775), with the Americas providing a particularly compelling example outside of the Old World (Mapunda, 2013). However, metallurgy as a complex multi-stage technology was present prehistorically in only three regions of the Americas: (i) the Peruvian/Andean area, (ii) Colombia-Lower Central America, and (iii) West Mexico (Maldonado, 2012; West, 1994). The two phases of metalworking discerned for West Mexico (Hosler, 1994: 45) both display remarkable influence from South America, notably Colombia in Phase One (roughly from 700-1100 CE) and the Andean/Pacific coast regions in Phase Two (from around 1100 CE onwards), in terms of both the techniques used and objects produced. Even more convincing is the notable lack of technological evolution in West Mexico, suggesting a direct import rather than a local development (Hosler, 1994: ch. 6).

The presence of prototype artefacts and South American-style technological information in West Mexico points to the presence of South America metalworkers. Traders from points south may have imparted some knowledge of metallurgy, but in

[64] West Mexico is defined as encompassing the modern-day states of Michoacán, Jalisco, Nayarit, Colima and Sinaloa (Weaver, 1972) and perhaps also Durango, Guanajuato and Zacatecas (Adams, 1977). The area can be considered a cultural area, whose core comprises Michoacán, Nayarit, Jalisco and Guerrero.

order for a complete transfer to take place, and in the absence of continuous overland diffusion, metalworkers must have come to West Mexico (Hosler, 1994: 185). It seems reasonable, therefore, to postulate that interaction took place in order to transmit the steps involved in this complex process. In this paper I investigate this proposed interaction through the lexicon of metallurgy, seeking to identify lexical borrowing as evidence of interaction between peoples from the two regions. Minimally, one could expect the transfer of key lexical elements related to processes and objects, elements that may survive in a language beyond the lifespan of the contact event. However, I find no evidence of such language contact between the two regions in metallurgy-related vocabulary. This result contradicts certain findings from archaeology and genetics, but may be explained in terms of the largely non-verbal nature of the transmission of technical knowledge, as well as the cultural continuity of technology.

The rest of this paper is structured as follows: Section 3.2 offers an overview of the evidence for the proposed interaction between the two regions from archaeology, genetics and linguistics. Section 3.3 outlines the linguistic material and samples used, while Section 3.4 presents the key results. I offer a discussion of the results in Section 3.5 and conclude the paper in Section 3.6.

3.2. Background

In this section I provide an overview of the evidence for interaction between South America and West Mexico from archaeology (Section 3.2.1), genetics (Section 3.2.2) and linguistics (Section 3.2.3).

3.2.1. Archaeology

Interaction between the Andean and northwest Pacific coast regions of South America, notably Ecuador and northern Peru, and West Mexico has been posited from the Early Formative period through to the Late Postclassic. Early claims of interaction lacked stratigraphic support and so relied solely on surface similarities; consider Reichel-Dolmatoff's statement that there was "something vaguely familiar" about the Capacha material [of Michoacán, in relation to artefacts from Ecuador] (Kelly, 1980:

35). Borhegyi (1961: 143-144) more systematically assembled a list of eight groups of parallel traits found in the two regions, namely: settlement patterns, ceramics, techniques, figurines, miscellaneous pottery objects, stonework, metallurgy and miscellaneous traits, although many of them now seem too general to be diagnostic of interaction. Nonetheless, the largely unidirectional south to north nature of the transfer (but see the discussion of shaft tombs below), as well as the lack of these features in Central America, points to a long-distance, long-term maritime interaction scenario (see, e.g., Callaghan, 2003). Furthermore the topography of Central America between these two regions, mainly mangroves and steep slopes, makes overland travel an unlikely possibility (Alex Geurds, pers. comm. 28/10/2015). Therefore, it is unlikely that these traits diffused gradually between groups by overland routes.

The earliest indication of interaction is provided by the Capacha cultural complex of West Mexico, dated to around 1450 BCE (Williams, 2004). Among the four types of pottery vessels associated with this horizon, the stirrup-spout pot displays affinities with similar items in archaeological contexts related to the Formative in the Andes, as well as in other parts of modern-day Mexico.[65] An example of the dichrome (red-on-cream slipping) decorative style from a similar period found in the Machalilla seacoast culture of Ecuador indicates a further possible connection with Capacha (Kelly, 1974). The later shaft tomb tradition (a possible successor of the El Opeño culture found in northwest Michoacán, also culturally linked to the Capacha complex (see Williams, 2004)) of the West Mexican states of Jalisco, Colima and Nayarit also displays functional and morphological similarities with tombs located in Colombia, Ecuador, Peru, western Venezuela and Pacific Panama (Smith, 1978: 186-189; however, see also Beekman and Pickering, 2016 for a non-interaction perspective). The earliest of these southern shaft tombs dates to 555 BCE at San Agustín, Colombia (Smith, 1978: 188), while the West Mexican tradition dates to the Late Formative and Early Classic periods. Moreover, we can note a similarity in type

[65] Kelly (1980) claims, however, that this style cannot be defined as either wholly Mesoamerican or South American. This reluctance to link the two styles is also supported by the lack of stylistic similarities in the figurines found in the two regions in the same period, as well as disagreement over the tomb chronology in northwest South America, which stretches from 1500 BCE to 500 CE (see Kelly, 1980: 36). As such, the Mexican shaft tombs have temporal priority over their South American counterparts, rendering south-to-north direction of influence harder to support.

of cranial deformation known as *tabula erecta* found in Machalilla (Ecuador) and Capacha, as well as at the El Opeño and Tlatilco sites of West Mexico (Kelly, 1980: 35).

At the Chorrera-phase site of Chacras in Ecuador (c. 1500-300 BCE) hollow figurines were found that depict females wearing short skirts and mini-mantles. Very similar costumes can be observed on ceramic figurines from the West Mexican shaft tomb site of Ixtlán del Río (400 BCE-400 CE), which also display multiple earrings and geometric polychrome motifs on the clothing. The *Relación de Michoacán* (de Alcalá, 1956 [1574]), a sixteenth century ethnohistory of the Tarascan people, indicates that these garments were being worn in the protohistoric and early colonial periods in Michoacán. It has also been noted that Tarascan clothing styles differed considerably to those of other Mesoamerican groups (Anawalt, 1992: 115-116), possibly indicating outside influence. Loom-woven textile fragments found in Ecuador and West Mexico (as well as in the southwest USA) made using the supplementary-weft and alternating-warp float weave weaving techniques are also held up as evidence of interaction (Anawalt, 1992: 124-126).

Some of the strongest evidence for contact lies in the domain of metallurgy. Extractive metallurgy developed relatively late in the Americas, several millennia after it had in the Near East and Europe, emerging in the central Andean region between 1800 and 200 BCE (Maldonado, 2012), although small hammered pieces of gold and native copper have been found from the Terminal Archaic (2155-1936 BCE; Lechtman, 2014: 15). By the time of the Spanish conquest three main metalworking areas existed in the New World: (i) Peruvian/Andean area; (ii) Colombia-Lower Central America, which can be divided into the Altiplano cultures on the one hand and the Muisca, Quimbaya, Sinú and Tairona cultures of central/northern Columbia on the other (Shimada, 1994);[66] and (iii) West Mexico (Maldonado, 2012; West, 1994). These areas are not considered to be loci of independent innovation (but see de Grinberg, 1990: 21), rather many scholars propose that metallurgical techniques

[66] Some scholars (e.g. Sauer, 1966; Helms, 1979, cited in Cooke and Bray, 1985:35) contend that the evidence in Central America suggests a trade rather than production scenario. This position is countered by, for example, West (1994) and Cook and Bray (1985), mainly on the basis of descriptions found in contact-period chronicles.

spread northward from South America to West Mexico via a maritime route (e.g. Hosler, 2009, 1994; Edwards, 1965, 1960; Arsandaux & Rivet, 1921). Previous accounts claiming an Asian influence on metallurgy in South America, such as Heine-Geldern (1954), have been universally discounted.

Hosler (2009, 1994) identifies two periods in West Mexican metallurgy: (i) Period I, from 700 CE to 1100 CE, which originates in Central and South America (notably Colombia), and (ii) Period II, from 1100 CE to Spanish contact, stemming from the Andean and Ecuadorian coastal regions of South America. During Period I, the lost wax casting method was common in West Mexico, reflecting techniques employed in Columbia, especially amongst the Quimbaya (Shimada, 1994). Both the Tarascan and Andean cultures made intentional use of bronze and copper-arsenic alloys, seemingly for their physical and sonic properties (Hosler, 1994). In Period II, bronze was used to also make practical objects such as needles, fishhooks, tweezers, axe heads, awls and possibly also agricultural *coa* blades, although the lack of weapons in both periods is notable.[67] The colour of these alloyed objects was their most important property in this later phase, with Hosler (1994: 138-139) claiming that West Mexican metalworkers purposefully over-alloyed their bronzes in order to create objects that displayed a brilliance and radiance akin to gold and silver (see also Roskamp, 2010).

The presence of prototype artefacts and particular processing techniques certainly suggests the presence of South America metalworkers in West Mexico. Traders from these southern regions may have imparted some metallurgical knowledge, but it has been claimed that metalworkers proper must have come to West Mexico to transfer the technology (Hosler, 1994: 185). Indeed "[t]he physical presence of Andean artisans in West Mexico is the most plausible way to explain the transmission of smelting, smithing and casting techniques" (Hosler, 1994: 186). She claims that "[s]ome elements of Period 2 metallurgy were introduced via the same

[67] A curious anomaly can be easily observed, however: alloys were being produced and used in South America when metalworking was first introduced into West Mexico, but it is only after 1100 CE that alloying began to be used in the latter region. The gap in transmission is curious and has not yet been adequately explained in the literature.

maritime exchange system[68] operating off the coast of Ecuador that had earlier transmitted the technical know-how and prototype objects of Period 1 […]" (Hosler, 1994: 184).[69] Indeed merchant groups in Ecuador and Peru had balsawood rafts and dugout canoes with sails; the former were used for shorter haul trips, for example to central Peru, while the larger canoes were used to travel to West Mexico (Edwards, 1960). These merchants probably travelled to West Mexico in search of the highly prized *Spondylus princeps* shells (e.g. Marcos, 1977/78). Andean demand for *Spondylus* shells could not always be met from the Ecuadorian coast alone, so merchants from this region travelled further north in search of the prized bivalve, which grows in warm waters of the Pacific Ocean in discontinuous pockets from the Gulf of Guayaquil in Ecuador to the Gulf of California (Mexico). In exchange for *Spondylus*, merchants received obsidian and copper, prized materials found further inland. It is of note that most metalworking sites in West Mexico are located along the coastal plain or have riverine access to it, that is, where the bivalves were harvested. Hosler, Lechtman and Holm (1990) and Horcasitas (1980) also cite the appearance of so-called axe-monies dating to between 500 and 1500 CE in coastal Ecuador and Peru, and West Mexico and Oaxaca as additional support for this maritime diffusion theory.

In a letter to the Spanish king (Charles V) in 1525, the chronicler Rodrigo de Albornoz wrote that 'Indians' in Zacatula (modern-day Zacatotlán, West Mexico), at the mouth of the Río Balsas, claimed that their fathers and grandfathers spoke of the periodic appearance of other 'Indians' from certain "islands" who came to the coast from the south in large dugout canoes (García Icazbalceta, 2010). They brought with them "exquisite" trade items and took back other local goods. If the sea was high, these traders stayed for five to six months, until the sea calmed and they could return.

[68] The more southerly arm of the Andean maritime exchange system, linking Ecuador and southern Peru referred to here is the Chincha Kingdom of Peru, a supposedly powerful coastal state and key trading port that emerged around 1100 CE. Within this system copper was used as an exchange commodity, and exchange rates for both gold and silver were fixed (Nigra et al., 2014: 43). So-called *mindalaes*, or merchant Indians, also bartered exotics including gold and silver from their base in Quito (Ecuador), paying tribute in, inter alia, gold to local lords from whose service they were exempt (Salomon, 1986: 105).

[69] Hosler also claims that "some lower Central American and Colombian components of the technology, such as buttons, may have diffused overland […]" (Hosler, 1994: 184). I will not discuss the possibility of an overland introduction in this chapter as the evidence for it is much scarcer.

In contrast, the *Lienzo de Jucutacato*, a pictorial account from 1565 regarding the origins of the people of Jicalán (Michoacán), their settlement and first offices, claims that Nahuatl-speaking Toltec groups with metalworking skills arrived from Veracruz in gulf southeast Mexico, passing through Central Mexico and settling in a number of locations in Michoacán (see Roskamp 2005, 1998; see also Section 1.4.1). This account constitutes a sacred history, combining both historic and mythical elements to support the authors' claims to ownership of mines and natural resources (Roskamp, 2013). It also clearly contradicts the South American introduction of metallurgy favoured by Hosler and predecessors, while also highlighting similarities in cosmovision between central and western Mexican groups, notably the Nahuas and Tarascans respectively.

Indeed it should be emphasised that these essentially diffusionist accounts are not universally supported. Schulze (2008: 214-218) draws attention to relevant issues in West Mexico, notably problems in identifying the provenance of certain isotopes, as well as the lack of a complete typology of, for instance, copper bells. Furthermore, some metal artefacts, such as those found at Tzintzuntzan, Michoacán (a former capital of the Tarascan Empire) display closer similarities to others in southern Mexico and the Mayan region than to South American cultures, suggesting a tighter connection to the closer regions (cf. the migration scenario described in the *Lienzo de Jucutacato* above). It should also be underlined that since the publication of Hosler (1994), very little new material has emerged in support (or otherwise) of the South America-West Mexico connection. This absence reflects the difficulties associated with conducting fieldwork in much of West Mexico, but is also indicative of the move away from macro-level, diffusionist approaches in the discipline.

3.2.2. Genetics

No full genetic studies have addressed the question of interaction between South America and West Mexico, although Brucato et al. (2015) offer some initial suggestive results. In this study, based on a genome-wide database of 62 Native American populations, a clear 'Andean' component is identified mainly, as expected, in individuals from Andean populations. However this Andean component is also

significantly present - albeit as a very small proportion - in the genome of four Mesoamerican populations, namely the Kaqchikel, Mixtec, Maya and Purepecha. Its presence in Mesoamerica is not correlated with the presence of other South American components, thus ruling out the possibility that it was brought by contacts via the Caribbean islands. It is also virtually absent in Central America, suggesting that it also was not introduced via overland routes.

It is clear that the Purepecha and Mixtec were renowned prehispanic metalworkers, although they used different metals and methods (see, e.g., McEwan, 2000; Hosler, 1994), while recurrent bat motifs on bells found in a huge cache in Honduras in the early twentieth century point to links in iconography and cosmovision with the Kaqchikel and other Mayan groups (Blackiston, 1910). Copper bells were also produced and traded in the Yucatan Peninsula even though the metal does not occur there naturally (Paris, 2008). Given this technological knowledge, Brucato et al. (2015) calculated the shortest distance separating each Mesoamerican group from an archaeological site with evidence of metalworking. This distance proved to be significantly correlated with the percentage of the 'Andean' component in the populations, indicating that its presence in Mesoamerica might partly have been mediated by the transmission of metallurgy. While these findings are certainly suggestive of some kind of long-distance interaction, the lack of chronology, namely when this 'Andean' component arrived in Mesoamerica, limits their influence at this stage.

3.2.3. Linguistics

The linguistic evidence for a connection between South America and West Mexico is probably the least convincing, and most controversial, of the three types presented in this paper. Moreover, the connections proposed concern genealogical rather than contact relationships, indicating a potentially different type of connection. In short, two main linguistic relationships have been proposed. The first claims a deep-time link (around 46 minimum centuries) between two language isolates: Purepecha in West Mexico and Quechua in the Andes (Swadesh, 1967, 1956). The second posits a sub-group of the Chibchan group, which encompasses languages from Mesoamerica

(including Purepecha), Central America and the Isthmo-Colombian area (Greenberg, 1987).[70] See Section 2.2 for a detailed discussion of these proposals, as well as an overview of the historiography of classification proposals of Purepecha.

The genealogical relationship proposed in Swadesh (1967) has been cited in some archaeological papers (e.g. Anawalt, 1992), somewhat problematically, as both accepted fact in linguistics and as support for a contact relationship. Campbell claims, however, that a Purepecha-Quechua relation is "out of the question" (1997: 325-326), but concedes that his decision is based on little linguistic evidence, since Swadesh's study was small and, tellingly, supports much archaeological evidence (see Section 3.2.1). McClaran (1976: 154) supports this view, while conceding that that linguistic relations between Mesoamerica and South America definitely exist but are "vacuously postulated in the absence of reconstructions and rules for deriving the attested languages […] from the reconstructions" (McClaran, 1976: 154).

In short, the comparative linguistic data do not currently support an argument for relatedness between languages of the two regions, either in terms of genealogy or convergence. But the lack of proven genealogical connection should not rule out the possibility of finding evidence for language contact, which would support the archaeological and genetic arguments (see Sections 3.2.1 and 3.2.2). The weight of archaeological evidence in metallurgy in particular motivates an argument for contact between people, likely artisans, of South America and West Mexico from the Late Classic onwards. Interaction generally implies some form of communication and in both short-term and long-term scenarios, linguistic material can be transferred (see, e.g. Thomason, 2001). Through the use of two languages lexical items can be transferred, especially in the case of culturally-specific vocabulary, often in order to fill a lexical gap. In other words "[i]f there has been diffusion of any sort, there is every reason to suppose that some loanwords must also exist" (Swadesh, 1964: 538). This chapter thus explores the interaction theories put forward in archaeology and genetics through the lens of language contact.

[70] This Chibchan group comprises the following languages: Antioquia, Aruak, Chibcha, Cuitlatec, Cuna, Guaymi, Lenca, Malibu, Misumalpan, Motilon, Paya, Rama, Tlamanca, Tarascan, Xinca and Yanoama (Greenberg, 1987).

3.3. Sample

Two key elements were compiled for this study: (i) the language sample, and (ii) the metallurgy vocabulary wordlist. In order to select a language sample, I first delimited the regions where metalworking is known to have occurred in the prehispanic period (from the Formative to Spanish invasion), giving three regions, namely: (i) the Andean region, (ii) Colombia/Lower Central America (also known as the Isthmo-Colombian area),[71] and (iii) West Mexico, or the West Mexican Metalworking Zone following Hosler (2009). On the basis of known modern language distributions (e.g. Lewis et al., 2015; Kaufman, 2007) as well as colonial language surveys (notably Gerhard, 1993 [1972]), I compiled a list of languages for the three regions, totalling 104 individual languages. I included modern and sixteenth century variants of the same language where sources were available (e.g. for Purepecha, Nahuatl and Quechua), modern and pre-modern (but not sixteenth century) variants (e.g. Otomí), only modern variants (e.g. Cora and Huichol, Uto-Aztecan languages spoken at the northern edge of West Mexico), or only the variant available for now extinct languages (e.g. Cuitlatec, an isolate spoken in Guerrero, Mexico until the 1940s). I also included the languages spoken by the cultures that had metallurgy according to Hosler (1994) and Horcasitas (1981), as well as a number of neighbouring languages for comparative purposes (see Figures 5-7 for the locations of the languages in each of the three regions; see also Appendix D), especially relevant in cases of widespread diffusion.

[71] The Isthmo-Colombian area, also known previously in the literature as the Intermediate Area or Chibchan Sphere, stretches from eastern Honduras in the north to Colombia and Venezuela in the south, through the core of Panama and Costa Rica. For a discussion of the defining features and limits of the area, as well of the nomenclature, see Hoopes and Fonseca (2003).

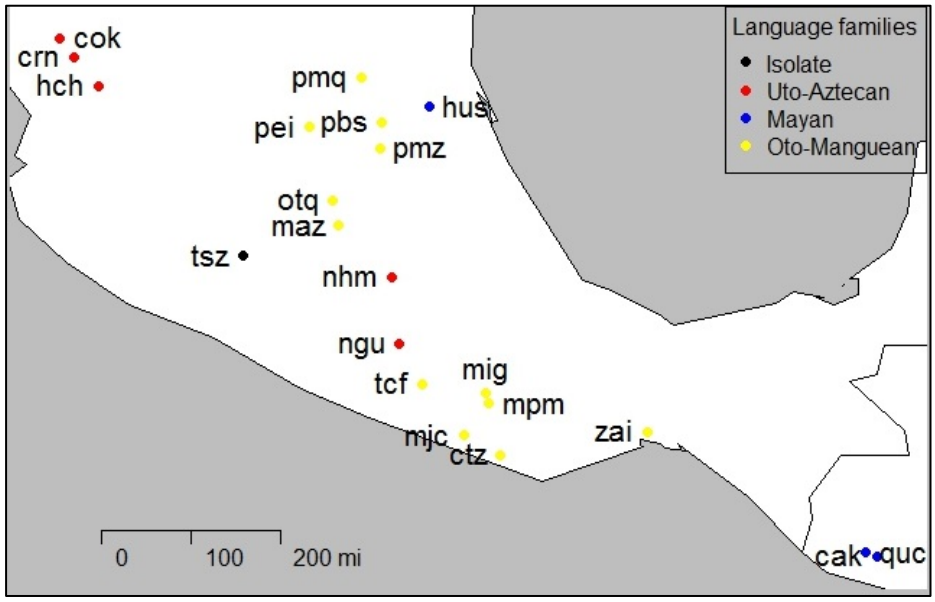

Figure 5: Location of languages in West Mexico used in this study

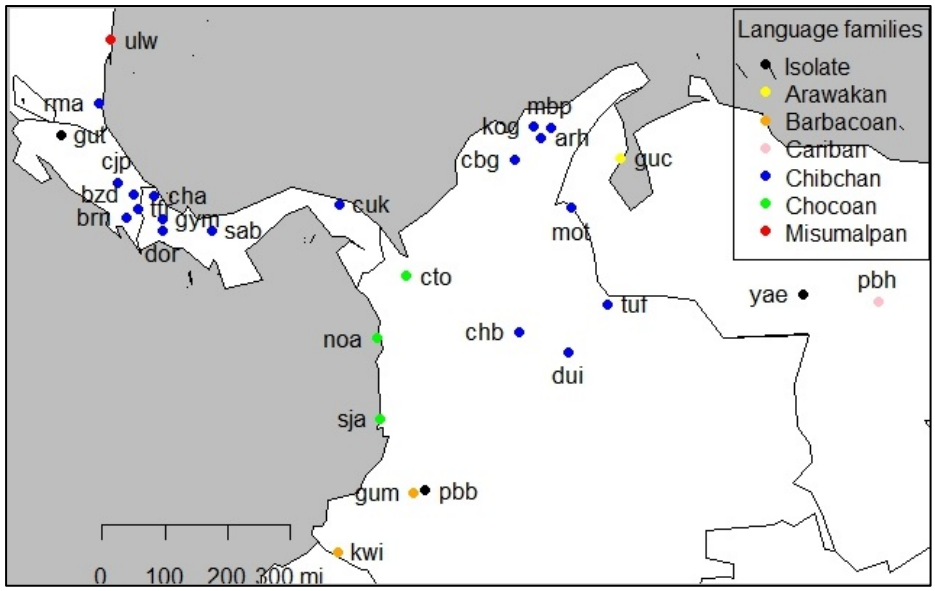

Figure 6: Location of languages in the Isthmo-Colombian Area used in this study

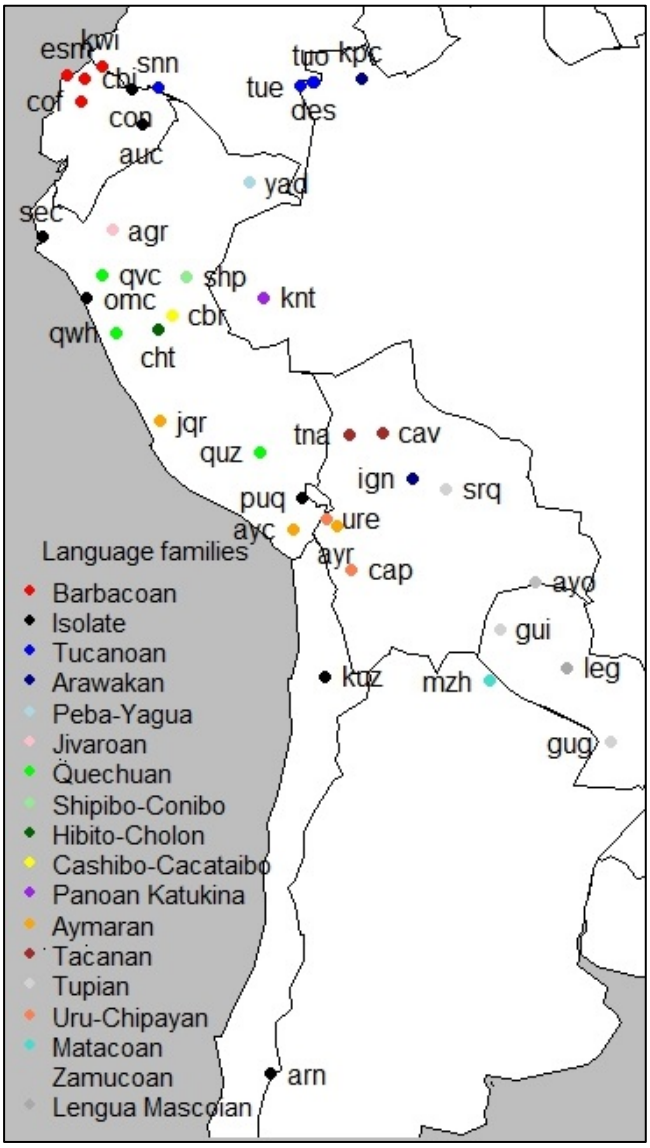

Figure 7: Location of languages in the Andes and neighbouring regions used in this study

Comparative lexical studies take as their point of departure a standardised wordlist, which is completed for every language in the sample. Basic vocabulary is often collected on the basis of the so-called Swadesh (1971) or Leipzig-Jakarta lists of

cross-culturally valid meanings (Haspelmath & Tadmor, 2009). Vocabulary related to more specific semantic domains may be found in, for example, the Intercontinental Dictionary Series (IDS; Key & Comrie, 2007) or Numeral Systems of the World's Languages (Chan, 2016). Given the absence of a readily available extensive list of terms for the domain of metallurgy (IDS contains a small number of terms, mostly metals and objects but is often incomplete), I compiled a novel wordlist comprising 123 items (see Appendix E) whose terms cover metals (e.g. copper, gold, silver), processes (e.g. to extend, polish, solder, shape), tools (e.g. file, [sledge]hammer, pliers), objects produced (e.g. bells, rattles, rings, tweezers), occupations (e.g. copper-worker, ironmonger) and the workplace (e.g. bellows, fire, pit, workshop). Key sources for this compilation were a trilingual Purepecha-Spanish-English dictionary of metalworking terms relevant to the hammered copper tradition of Santa Clara del Cobre, Michoacán (Pérez Pamatz & Lucas, 2004) and archaeological works on West Mexico (Hosler 2009, 1994) and the Andes (Shimada, 1994).

The division into categories - tools, processes, and so forth - is reminiscent of the five related components that Lemonnier (1992: 5-6) claims every technology comprises, namely: (i) matter, or the material on which a technique acts, (ii) energy, the forces which move objects and transfer matter, (iii) objects, often called artefacts, tools, or means of work, (iv) gestures, which move the objects involved in a technological action, and which may be organized in sequences, and (v) specific knowledge, which may be conscious or unconscious and not necessarily expressed by the actors, and constitute 'know-how' or manual skills.[72]

3.4. Findings

The most striking finding of the lexical comparison is the lack of clear loanwords from South America in any of the West Mexican languages in the sample. Possible explanations for this absence are discussed in Section 3.5 (see also Section 4.5 for a discussion of resistance to borrowing). Nonetheless, a number of observations can still

[72] An anonymous reviewer notes that Lemonnier's (1992) categorisation lacks the products of the metalworking process. While the match between the two categorisations is clearly not exact, the broad parallels are worth mentioning, especially in light of the discussion regarding the anthropology of technology and the nature of knowledge transmission in Section 3.5.

be made regarding loans on a smaller scale, as well as shared naming strategies between the regions, for metals (Section 3.4.1) and metal objects (Section 3.4.2).

3.4.1. Metal naming strategies

In the absence of any notable instances of loanwords between the areas under analysis, shared naming strategies become the most worthwhile locus of study. For terms referring to specific metals, as well as for the generic term for 'metal', six naming strategies have been identified that cross-cut the three metalworking regions in the sample, namely the use of: (i) colour terms, generally compounded, (ii) other physical properties, also generally compounded, (iii) terms for excretions of different types, (iv) borrowings, (v) processes, and (vi) extensions to the environment, namely toponyms and hydronyms.

Let us begin with naming strategies based on colour terms. Copper is most frequently considered a red metal, named as such in Purepecha (isolate) *tiyamu charapeti* 'metal/iron red', Coastal Mixtec (Oto-Manguean) *xùhùn cuaahá* 'copper money, copper' (lit. 'money red'), Classical and Modern Huastec (Mayan) *tzacpatal* 'red iron/metal', K'iche' (Core K'iche'an) *kiäq puaq* 'red money/silver', Lengua (Lengua-Mascoy) *yan-sowu ik-yithwase* 'like red iron', and Cofán (isolate) *kɨʔa yošaβa* 'red metal'. However Chiriguano (Tupían) and Wichí (Matacoan), both in South America, use terms including an element meaning 'yellow' to label their copper, viz. Chiriguano *korepoti*[73] *ijŭag*^{w}*e* 'lit. orifice.excrement-yellow', and Wichí *la-činah-'tˀoh kaʔteʔ* 'copper, bronze' (lit. 'poss.-iron (its) skin yellow'). Highland Mixtec, in contrast to its Coastal counterpart, has *kaa kuaan* 'metal, iron, steel yellow' to refer to both copper and gold, while Classical Otomí also combines the terms for yellow and iron in *xancaxtii bueca* 'copper'. K'iche' (Core K'iche'an) uses a different colour again in the compound *räx ch'ich'* 'iron; steel' (lit. 'blue, green metal'). In Classical Quechua 'copper' is translated as both *puca anta* 'red copper' and *quellu anta* 'yellow copper' although in the modern language *anta* refers only to 'red earth' or 'red soil', commonly found in the Andes.[74] Moreover the four colours of copper -

[73] Dietrich (1986: 302) speculates as to whether the first element of *korepoti* 'metal, iron; money' (from *cuaré* 'orifice') is not related to the Quechua term *qori* 'gold'.
[74] I thank Willem Adelaar (pers. comm.) for bringing this discrepancy to my attention.

blue, green, yellow and red, found in its various forms pre- and post-processing - can all be discerned on the insect known as the *tepuzchapule* or *chapulín del cobre* 'copper-grasshopper' in Nahuatl (Uto-Aztecan) and Spanish respectively, found in Guerrero, West Mexico (Hendrichs, 1944).

Compounds with 'money, metal' and 'white' predominate in terms for silver, for example, Coastal Mixtec (Oto-Manguean) *xùhùn cuitsín* 'money white', Mazahua (Oto-Pamean) *tʔɔxʉ* 'white', Otomí *nataxii* 'white' (the latter two forms may be related), Kaqchikel (Core K'iche'an) *saka mero* 'white money', Paez (isolate) *gueyóchime* 'white metal', Chiriguano (Tupían) *korepoti-tĩi* 'orifice.excrement-white', Lengua (Lengua-Mascoy) *yan-sowu ik-mopaiya* 'like white iron', and Teribe (Chibchan) *dëburr frubrunë* 'money white'. In a similar vein, the Classical Quechua *yurak titi*, literally 'white lead', refers to tin.

Gold is described as yellow in Classical and Modern Purépecha (isolate) *tiripeti*, from the root *tirí-* 'dull yellow', Classical and Modern Huastec (Mayan) *taquimanul* 'yellow metal', Classical and Modern Kaqchikel (Core K'iche'an) *ʒana puvak, q'anapuwäq* 'yellow silver/money', K'iche' (Core K'iche'an) *q'än puaq* 'yellow silver, money; also copper', Coastal Mixtec (Oto-Manguean) *xùhùn cuàan* 'money yellow', Bribri *inúkür xiká skirirí* 'money material yellow' and Teribe (both Chibchan) *dëburr xoñõró* 'money yellow', Chiriguano *korepoti-ǰu* and Guaraní *kuarepoti-ǰu* (both Tupían) 'orifice.excrement-yellow', Lengua (Lengua-Mascoy) *yan-sowu ik-yatiktama* 'like yellow iron', Tsafiki (Barbacoan) *laske kala* 'yellow silver'. The term for 'gold' in Miskito (Misumalpan) is synonymous with that for 'yellow' - *lalahni* - but with no compounding. Paez (isolate), on the other hand has a term for gold including 'red' and not 'yellow': *βyuu beh* lit. 'money red'. Ayoreo (Zamucoan) far to the south of the Andean region has *ge'beeke naaŋana-'taai* lit. 'metal that shines', although the element *naaŋana-* seems to be related to *naaŋana-'taai; naaŋana-taa-'ge* 'blue'. This relation reminds us of the Cha'palaa (Barbacoan) term *lushi* 'money', which is also related to the term for 'blue'. The colour term probably derives from the word for silver rather than vice versa; in order to construct the colour term additional morphology must be added, e.g. *lushkatata* 'blue, green' (Wiebe & Wiebe, 2015), *lushishi* 'sky blue'. The latter term demonstrates how the

final syllable must be reduplicated for a special ideophone-like class of words for qualities (Simeon Floyd, pers. comm. 27/09/2015).

The Ayoreo 'shiny metal' example could also be included in the second naming strategy, namely physical properties of the metals. Ulwa (Misumalpan) and Guambiano (Barbacoan) emphasise the shininess of precious metals by using the terms *kî yaringka* 'gold' (lit. 'stone shiny') and *pilapik* 'gold, silver', related to the term for 'shiny' (Simeon Floyd, pers.comm. 27/09/2015), respectively. Aymara possesses the term *isayawri* 'very hard copper', reflecting the stronger, less brittle properties of bronze as compared with copper once heated and worked. In line with the known geographic distribution of alloying knowledge in the Andean region, we also find *kisu* 'another type of copper, which the 'Indians' used like steel because when mixed with another metal it becomes harder' in Classical Aymara (Aymaran).[75] Kallawaya (mixed language) displays *jichcha jiri* 'bronze, lit. false stone' and *llalle jiri* 'iron, copper', lit. 'good stone', while Uru (Uru-Chipayan) gives *čok-kxā* 'copper', lit. 'fat silver'. In Ngäbere (Chibchan) we find *jä tuäre* 'stone beautiful' for 'gold', reminiscent of these Kallawaya compounds including a familiar material. Sonic properties are also present in the sample, but only in West Mexico with Matlaltzinca (Oto-Pamean) *inmahathi* 'silver', lit. 'that which rings/sounds'.

The third strategy identified is naming metals according to various types of excretions. We find in Chiriguano and Guaraní (both Tupían) *korepoti iǰuag*^{w}*e* and *kuarepoti-ǰu* 'copper' (lit. 'orifice.excrement-yellow'); Chiriguano (Tupían) *korepoti-tĩi* 'silver' (lit. 'orifice.excrement-white'), Chiriguano *korepoti* and Guaraní *kuarepoti-ǰu* 'gold' (lit. sun=defecate-yellow, 'yellow sun faeces'). The circumlocution for copper is apparently a "Jesuitic depreciative creation" (Dietrich, 2015 [2007]), reflecting native ideas regarding the origin of metals. However Roskamp (2010: 70) notes that two prehispanic Mesoamerican cultures also possessed conceptions related to excrement of the main celestial bodies: Nahuas from the central valleys of Mexico referred to gold as *teocuitlatl* 'holy shit'[76] or *tonatiuh icuitl*

[75] We also find *kis* in the Chumulu dialect of Dorasque (Chibchan), which may be a loan from Classical Aymara.
[76] This translation may be somewhat colloquial. Willem Adelaar (pers. comm.) suggests a more suitable translation to be 'excrement of the Gods' (compare *teocalli* 'temple, house of the gods').

'excrement of the sun', as perhaps also did some Mayan groups, see the Yucatec Maya *tàak'in* 'money', possibly from *ta'* 'excrement, shit' plus *k'iin* 'day, sun, time, epoque' (Willem Adelaar, pers. comm.; Bastarrachea et al. 1992). The Tarascans of Michoacán also believed gold to represent the sun's excrement, and silver that of the moon, but did not encode this lexically (Roskamp, 2010: 70).

As indicated in Section 3.1, no long-distance lexical borrowing has been identified in this study, although borrowing at a more local level can be observed, especially in the case of Quechua *qori* 'gold' (see Figure 8). This term has been borrowed into various other languages across the Andean and Amazon regions, often with the same meaning and little phonological adaptation, viz: *qori* (Aymara, Aymaran), *qori* (also 'tin, tinplate', Chipaya, Uru-Chipayan), *qori* (Uru, Uru-Chipayan), choa-***curi*** lit. 'earth gold' (Tukano, Tucanoan), *kuri* (Aguaruna, Jivaroan), *kuri* (Cashibo, Panoan), *kori* (Cofán), *kori* (Shipibo-Conibo, Panoan). A related case is *kuruki/kuriki* (Yagua, Peba-Yaguan), which is borrowed from Quechua *qullqi* 'money' despite its surface similarity to *qori*. The variation in the medial vowel reflects the lowering of the original Quechua /u/ to /o/ in the uvular environment /q/.

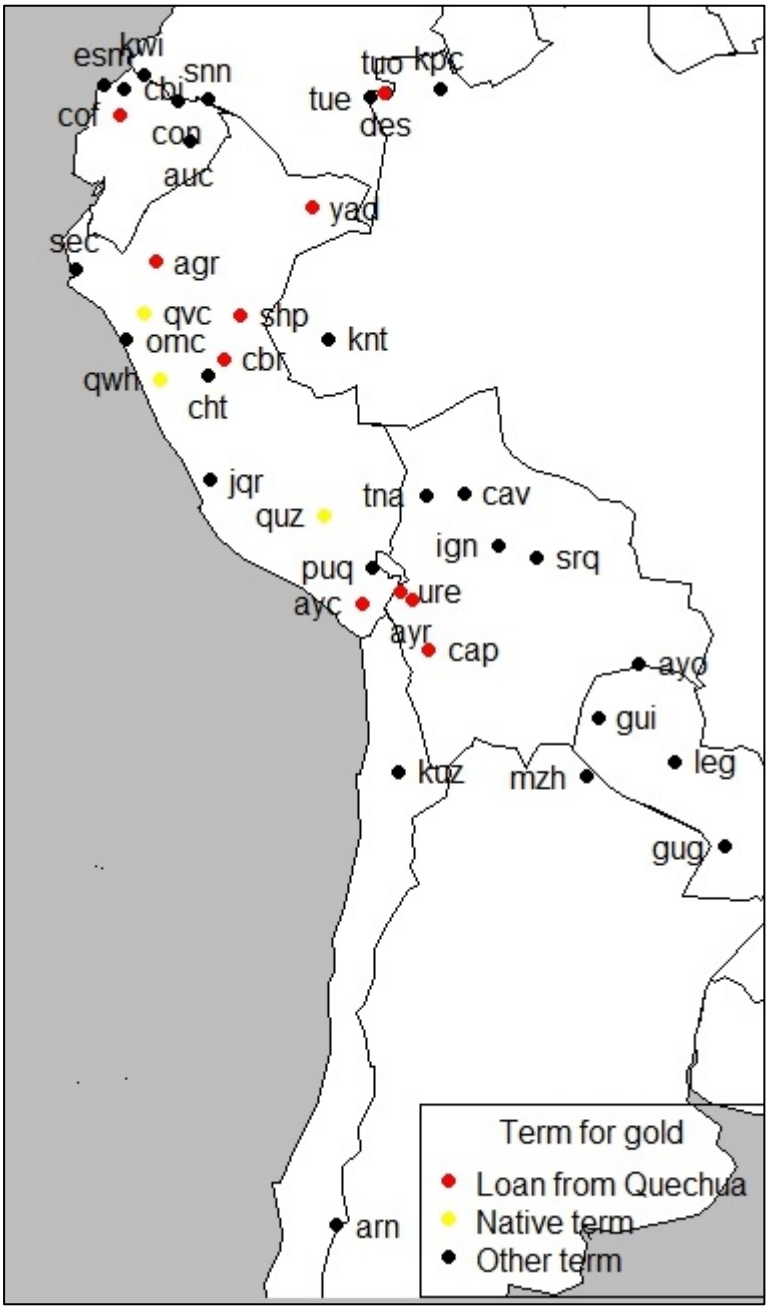

Figure 8: Distribution of terms for 'gold' in the Andes

No such examples of diffusion can be found in unrelated languages in Mesoamerica or the Isthmo-Colombian Area. However it is also worth noting the case of Taíno *wanĩ* 'low grade of gold', which gives us the Modern Spanish *guanín* 'idem'. Moreover the Galibi (Cariban) term for copper *karakuli* lit. 'money-gold' emerges as a loan in Warao (isolate) *karakori/corucuri* (also 'tool blade'), and *kalakuli (*also 'silver') in Wayampi (Tupían). Note the parallel here with Quechua *qara qori* lit. 'bare/naked gold'.

Ironsmithing only emerged in these original metalworking areas with the arrival of the Spanish, who brought their own techniques from Europe. Until that point, indigenous technologies had focussed on copper, gold, silver and alloys thereof, notably arsenic and tin bronzes. As such we might expect fewer native terms for 'iron', or in other words, a higher proportion of loanwords from Spanish. In fact, there are no more loans from the Spanish *fierro, hierro* 'iron' in the sample than for other terms, with the loan emerging in the following languages: *firru, fyerru, jirru, jyerru* (Cajamarca Quechua), *firru* (Jacaru, Aymaran), *hiru* (Chipaya, Uru-Chipayan), *hiórro* (Emberá, Chocoan), *ɸe'ro*, *he'ro* (Tsafiki, Barbacoan), *jeru* (Cha'palaa, Barbacoan), and *hihu* (Aguaruna, Jivaroan). These seven languages (the same number of languages that possess a loan for 'copper') are all located in the Andean region.

A number of other localised borrowings are also observable: (i) Cajamarca and Classical Quechua (Quechuan) *qquillay* 'iron; silver, money' appears as *quellaya yauri* 'iron, copper, needle' in Classical Aymara; (ii) Cusco, Cajamarca and Ancash Quechua (Quechuan) *chay-anta* 'iron, metal, tin' (lit. 'shine-copper') emerges as *chunta-chay* in Uru (Uru-Chipayan) and possibly also *c'haj* in Mochica (isolate); (iii) the terms *saanzen , saanzén, santsɵn* 'iron' in Guambiano (Barbacoan) and *satsám, cɐm* 'iron, metal' in Paez (isolate) also bear a suggestive resemblance to each other; (iv) the term *carimbo* 'iron for marking/branding Caribbean Indians and black Africans' is a loan from the Kimbundu (Central-Western Bantu; Angola) *kirimbu* (da Silva Maia, 1959) into Island Carib and from there to Taíno (Arawakan). *Carimbo* is used in modern-day Brazilian Portuguese as 'stamp', while *calimba* still exists in Cuban Spanish, but now refers to 'iron with which one brands animals' (RAE, 2014); (v) Miskito (Misumalpan) of Honduras and Nicaragua has borrowed *silak* 'steel' from

the Rama (Chibchan) *shílak, sílak* 'iron'. This example demonstrates how a society with no known prehispanic metalworking has borrowed and extended a term from a neighbouring, unrelated language to fill a conceptual gap.

The fifth, but not very widespread, strategy is the use of processes used in metalworking to name the metals themselves. Siona (Tucanoan) possesses a compound that refers to the process of gathering placer gold, namely *sˀoa kut'i* lit. 'wash money'. Classical Quechua *hičʰay* 'to pour into mould, smelt' now refers only to the more generic verb 'to pour'. Purépecha (isolate) recalls the shaping phases of the process in *tayacata* 'silver' from the root *taya*-'to give blows'. Shipibo-Conibo (Panoan) *yami βoi* lit. 'metal beeswax'[77] also seems to reflect an aspect of the lost-wax casting process.

Finally, terms for metals also emerge in toponyms and hydronyms in both the Isthmo-Colombian and West Mexican regions. Kuna (Chibchan) incorporates *or* 'gold' (likely not a borrowing from Spanish, cf. Cabécar (Chibchan) *oloi* 'shine') into a hydronym, *Tiórti* 'gold river'. Ngäbere (Chibchan) displays the toponym *Pocri* in Los Santos department (Panama), meaning 'place of the lance/spear' (Pinart, 1897). *Bugaba* (Dorasque, Chibchan) has the same term with the same meaning. In West Mexico copper prevails over gold in toponyms, as in *Tepoztlán* 'place where copper abounds' (Nahuatl, Southern Uto-Aztecan), whence *tepuztecatl* 'native of Tepoztlán'.

3.4.2. Naming strategies for metal objects

In the same vein as for metal terms, the words for metal objects in the sample display certain similarities in naming strategies, namely: (i) use of metal terms (polysemy), (ii) natural world predecessors, (iii) loans (largely from Spanish), and (iv) sound symbolism, which is possibly also related to the natural world predecessors.

A large amount of polysemy is also observable in the terms for metal objects in the sample wordlist. For example in Huastec (Mayan) *patal* means 'bell' and 'lance' as well as 'metal', a pattern also partially reflected in Cuitlatec (isolate) *pɨ̀hpɨ́* 'bell; metal, iron'. In Awa-Pit (Barbacoan) *pyalmiŋ* 'axe' is also 'silver, money', a

[77] The term 'wax' reconstructs for Proto-Panoan *βoičo. See also *yami with related meanings 'iron, machete, metal' (IDS, 2007), found in modern reflexes such as Amahuaca *yamí* 'metal axe', Capanahua *yami* 'axe'.

pattern reminiscent of the so-called axe-monies that were used as a type of currency in long-distance trade between South America and West Mexico (see, e.g., Hosler et al., 1990). Note also Quechua *tumi* 'sacrificial axe', which can also refer to these axe monies. Miskito (Misumalpan) possesses *ayan* 'iron; *plancha*', Bribri (Chibchan) *ta-be* 'iron, knife, anything made of iron', Mazahua (Oto-Manguean) *tʔëzi* 'iron; machine, tractor'. Cashibo (Panoan) also classifies *manɨ* as 'metal axe and things of foreign origin' while the Classical Huastec *lencodpatal* is literally analysed as 'fishhook-metal', while Nahuatl (Southern Uto-Aztecan) *tepuz(tli)* conflates 'pin' and 'copper'. An even broader meaning can be found in Classical Aymara (Aymaran), where *juch'usa* refers to a 'round thing such as a stick, pole, pin'.

A further example of polysemy, as well as a clear case of borrowing, is the Quechua *yawrina* 'fishhook' and Cusco Quechua *yawri* 'needle', from Aymara *yawri* 'copper, iron'. Another clear case of borrowing in the Andes is found in Classical Quechua (Quechuan) *ttipqui ttopo* 'pin', Cusco/Cajamarca/Ancash Quechua (Quechuan) *tupu* 'pin, brooch' which emerges in Puquina (Puquinan) *tupu* 'pin, needle', Classical Mapudungun *tupú* 'pin' and Chipaya (Uru-Chipayan) *tupu* 'pin'. In Mapudungun we also find *tirana* 'tweezers' borrowed from (here) Cusco Quechua *t'irana* (< *t'ira-* 'to pluck' and *-na* instrumental nominalizer), where the meaning is the same.

Yet it is clear that new metal objects did not necessarily require a new label, especially in areas where metallurgy emerged later. Some objects that came to be made of metal had predecessors (and thus labels) in the natural world or as part of lithic or wooden technology. Examples include 'arrow', which in Damana/Malayo (Chibchan) is *bi-ngɨla* 'maguey arrow/spine', Classical Aymara (Aymaran) *piqacha, phichaqa, pichaqa* 'long needle of thorn, copper or iron that can be used for sewing'. Taíno (Arawakan) had the term *manaya* 'stone knife, axe made of planks of royal palm'. We also find Guatuso (Chibchan) *zafára* 'wooden knife', Sirionó (Tupían) *yvyra raimbe* 'wooden sword' (Cadogan, 1992); Huichol (U-A) *oparu* 'stick in the form of a sword'. Chimila (Chibchan) has extended the meaning of *kangʔraʔ* 'arrow

shaft' to 'gun' on the basis of similarities in shape or use.[78] It is also worth noting a parallel in terms for precious stones and gems, which may come to refer to new materials, as in the Quechua *qispi* 'crystal, glass', where the former term is likely the original meaning (Willem Adelaar, pers. comm.).

Two major Spanish loans can be noted in the terms for 'coin, money'. The first is *tumín* in various West Mexican languages: *tuminu* (Purépecha, isolate), *tamèiŋ* (Pame, Oto-Pamean), *tumino* (Cuitlatec, isolate), *tomin* (Nahuatl), *túmiin* (Cora); *tumini* (Huichol; all three Southern Uto-Aztecan), *tumin* (Huastec, Mayan); *tomim* (Classical Huastec, Mayan), *tomines* (Classical Zapotec; Oto-Manguean). *Tumino* must be a relatively early loan into Mesoamerican languages since it appears, albeit not as the simple translational equivalent for 'money' but as part of phrases containing this meaning, in the Classical Purepecha *Diccionario Grande* which, while undated, is thought to date from before or around 1587 (Warren, 1991: xix). The term also occurs in other ethnohistorical documents, such as those from Zinapecuaro (Michoacán) dating to 1566, indicating an even earlier appearance. The second major loan from Spanish is *plata* 'silver, money', found in a smaller number of only South American languages as: *burata* (Warao, isolate), *parata thórro*, *parata* (Emberá, Chocoan), *pʰaratʰa* (Epena, Chocoan), *arata* (Panare, Cariban), *podata* (Waorani, isolate). A third and more minor loan derives from the Spanish *dinero* 'money', being found in *nnehrrü* (Guajiro, Arawakan) and *niyeruse* (Desana, Tucanoan).

Finally there are a number of examples of apparent sound symbolism, such as terms for 'blowtube' or 'to blow' begin with /p-/ or /ph-/ in Quechua, Aymara, Puquina, Mochica, Kunza, Mapuche, Tsafiki, Atacame, Chipaya, Paez, Desana, Tukano, Chimila and Waunana (all in South America). The Classical and Modern Quechua terms *taca taca* 'silver- or coppersmith hammerer' and *takana* 'to hammer' respectively may also fall into this category. Also note the reduplicated forms Guatuso *ku:tʃ-ku:tʃ* 'hammer' and Warao *jurujurú* 'to file', which may reflect the repetitive action or motion of both associated with the tool or process in question.

[78] I thank an anonymous reviewer for the second interpretation of the semantic extension, but cannot clarify which is more appropriate for this term.

3.5. Discussion

We saw in Section 3.4 that there is virtually no evidence of direct lexical borrowing between the Andean region and West Mexico in the lexical domain of metalworking despite support from archaeology and genetics for interaction in this, and other, domains. The only evidence of widespread borrowing was from Quechua to other unrelated languages in the Andes; Mesoamerica and the Intermediate Area displayed a small amount of borrowing within their own boundaries but no evidence of longer-distance loans. In this section I will discuss several possible explanations for this absence, as well as offering tentative motivations for certain shared patterns.

The nature of knowledge transmission, in both technical processes and everyday life, may impact upon the amount of linguistic interaction between individuals. Evidence from, *inter alia,* history, ethnoarchaeology and ethnography indicates that "the transmission of technological knowledge in pre-industrial settings was, and continues to be, fundamentally different from that in modern industrial societies" (Killick, 2004: 573). In industrial societies, technological knowledge and skills are acquired largely through language and illustrations, whereas in non-industrial societies technical skills were, and are, communicated "through a blend of verbal and non-verbal instruction" (Killick, 2004: 573). Pfaffenberger (1992: 501-502) also notes that another key feature of such systems "is their *silence*, the relatively insignificant role played by human language as against nonverbal communication in ritual […] as a coordinator of technical activities." The few studies of specialized crafts requiring apprenticeships, into which metallurgy falls, such as those concerning Liberian tailors (Lave, 1988) and Ghanaian weavers (Goody, 1978), have noted the small part language seems to play in the knowledge transmission process, as well as the tendency for people not to talk about the activities involved (Bloch, 1992: 186). Given that language is not central in the transmission or production processes, we could view the way in which a task is explained as a "*post hoc* overlinguistic rationalization" (Bloch, 1998: 23-24), or in other words a retrospective explanation using an inherently inadequate verbal medium to explain a non-verbal action.

Support for the lesser importance of language in the knowledge transmission process is also found in practical, everyday tasks, which can be viewed as culturally

specific, complex and embedded in social life (Bloch, 1992: 186, following the renowned French anthropologists of technology Mauss, Leroi-Gourhan and Haudricourt). This lack of linguistic explicitness is particularly observable in the way everyday tasks are taught to children; we do not generally go through a step-by-step verbal explanation of how to do something, we more often show by doing. Similarly, the process of becoming an expert in a particular domain "seems to involve the transformation of the [linguistic] propositions of the teacher into fundamentally non-linguistic knowledge" (Bloch, 1992: 187). Nonetheless, even if the explicit language used to explain a process may not constitute the most accurate record of the process itself, the fact that a process can be explained in the language of the society that uses it indicates that the terms can be communicated to members of other [linguistic] groups.

The transfer of existing terms to new metallurgical objects or processes that may be viewed as largely analogous could also account for the small number of loans. In her discussion of the transfer from stone working to copper working in the Lake Superior basin, Martin (1999: 117), following Cushing (1894), notes that "no new art [in the sense of working new or unaccustomed material] was ever practiced by aboriginal Americans as strictly new". Indeed Cushing (in Martin, 1999) linked metalworking with established technologies using stone, wood, hide, shell and bark, indications of which we observed in the use of terms for pre-metal objects in Section 3.4.2. The methods chosen to design and produce metal artefacts, as well as artefacts of other materials, are constrained "not only by the practicalities associated with metalworking from raw metal to finished product but also by cultural influences, some of which will have been borrowed from existing material technologies such as ceramics, carpentry and textile manufacture" (McEwan, 2000: 236). This recalls the social constructionist approach to the study of technology (see Killick, 2004 for a short overview) whereby metallurgy, along with all other technologies, is viewed as a social production determined by, or compatible with, other social phenomena (Lemonnier, 1992: 17) and as such develops as part of a particular societal system. This "fully human experience" (Hosler, 1994: 250) both draws our attention to the

agency of the actors involved, as well as helping to account for cultural (and linguistic) variation in terminology and patterns of borrowing.

A further point to consider is that the contact situations for metallurgy transmission were simply of insufficient length or intensity for borrowing to occur (see also Section 4.3). Lexical items (and other linguistic material) will only be transferred if they are heard frequently enough; if the contact scenarios for the transfer of metallurgy were relatively short, or if indeed the linguistic element of such interactions was minimised, then the absence of loanwords is to be expected. In the case of the widely diffused terms in the Andes, the use of Quechua as a *lingua franca* and as the language of a large, powerful empire, the imposition of terms for new materials is more understandable, since the more dominant language is more likely to impose on the subordinate one (see Thomason, 2001).

Turning from the more conceptual to the methodological, an implicit limitation of this study is the lack of data, particularly for languages of the Ecuadorian and Peruvian coast, from where much of the maritime trade is claimed to have originated. Furthermore, I cannot claim to have included all the languages spoken in the metalworking regions prior to contact, since many of these languages died out before being described. It is well known, for example, that the population of modern-day Mexico plummeted by around 90% in the first 100 years of Spanish occupation, meaning a large number of languages were also lost forever. Unfortunately these are gaps in the data that are impossible to fill and have to be accepted in a study of this nature.

Nonetheless, certain patterns in the data can be observed in the three regions under study that merit consideration in the wider archaeological-anthropological context. A key factor to note from the outset is the differences in the socio-political situations in the three regions, which can impact on the type of interaction between speaker groups. The Andes appears to be the only region where widespread lexical borrowing has occurred, for example Quechua *qori* 'gold' is found in a number of other unrelated Andean languages (see Figure 8). In other lexical domains, including basic vocabulary, Quechua influence is observed in many Andean and western Amazonian languages (Adelaar, 2012). This influence can be attributed mainly to

Quechua's status as a *lingua franca* in the late stages of the Inca expansion (1470-1532 CE) as well as during Spanish occupation (1532-1770 CE), where it was used, *inter alia*, for Christianising purposes. As such, Quechua was imposed upon speakers of other indigenous languages, entailing the imposition of new terms, perhaps related to new technologies or the knowledge of such technologies. The existence and use of a *lingua franca* also entails more stable and widespread bilingual situations, which in turn leads to the increased likelihood of borrowing. In contrast, although Purepecha, the lingua franca of the Tarascan Empire of West Mexico (a heartland of metallurgy in the region), was also used by Spanish friars in the sixteenth and seventeenth centuries for evangelizing purposes (Hamel, 2008: 313), no comparable widespread lexical borrowing can be observed. One or more of a multitude of socio-political and linguistic factors could account for these differences in borrowing patterns, but direct comparisons are clearly hard to draw (see, however, Chapter 4 for a discussion of the changes in borrowing patterns in Purepecha and the nature of loanword resistance).

Indeed the major dynasties of Postclassic Mesoamerica – notably the Aztec Triple Alliance and the Tarascan State – co-existed along bellicose lines until contact with the Spanish in the early sixteenth century. Despite at least twenty languages being attested in the Tarascan Empire (see Section 4.2.1 for an overview), there is very little evidence of lexical borrowing between them, not even from Purepecha, the language of the rulers who also managed mineral resources (Pollard, 1987), to other languages.[79] The lack of borrowing is perhaps all the more surprising when we consider that Mesoamerica, which includes all of West Mexico, has been held up as a prime example of both a linguistic area (LA; Campbell, Kaufmann & Smith-Stark, 1986) and a cultural area (Kirchhoff, 1960 [1943]). Of the five core features that define Mesoamerica as a LA, four are grammatical while the fifth constitutes a number of semantic calques such as 'head of leg' for 'knee' and 'stone/bone of bird' for 'egg' (Kaufman, Campbell & Smith-Stark, 1986: 554), indicating a certain amount of conceptual diffusion. We might expect more conceptual diffusion then, even if lexical borrowing *per se* is not as widely attested across the area.

[79] But see Cuitlatec (isolate) *navajo* from the Spanish *navaja* 'folding knife, pocket knife' (RAE, 2017).

A feature not included in the LA diagnostic traits but also quite widespread across Mesoamerica, is the association of particular colours with cardinal points or directions (see De Wolf, 1994).[80] Colour symbolism is shared in the metallurgy domain by, for example, Purepecha and Nahuatl, as in the compound 'red metal/iron' for 'copper', as well as with Huastec, a Mayan outlier that most probably acquired metalworking from central Mexico (likely through Nahuatl speakers; see Hosler & Stresser-Pean, 1992). Yet Highland Mixtec (Oto-Manguean), also said to be part of the LA, makes use of a compound including the term 'yellow' to describe the same metal. That said, colour as a naming strategy is not restricted to Mesoamerica, or the Americas more widely; indeed many African languages refer to copper as 'red metal' or 'red iron' (Herbert, 1984: 10). This variety in conceptual associations is therefore not unusual, even in an area well connected through commercial networks such as Mesoamerica and its neighbouring regions (see Weigand, 2001 for an overview of such networks).

Similarly the small number of borrowings in the languages of the Intermediate Area is intriguing, especially since the region has long been a locus of long-distance exchange and a commercial nexus (O'Connor, 2014: 77). Equally striking is the high number of cognates per term: take for example the term 'gold', which offers at least eight cognate sets in the Chibchan languages alone. This may seem odd at first sight, given how genetically (Barrantes et al., 1992) and linguistically (Constenla, 1991) stable the region has been since the earliest stages of its continuous inhabitation some 10,000 to 12,000 years ago (O'Connor, 2014: 77). Moreover Bray (1992, in Hoopes & Fonseca, 2003: 64) describes the region as "one metallurgical province", encompassing both Chibchan and Chocoan speakers, on the basis of stylistic similarities termed the 'International Style'. Nonetheless the similarities in material culture and belief systems, coupled with long-term conflict, have led to the region being described as a "diffuse unity" (Fonseca & Hoopes, 2003). Bray (1984, in O'Connor, 2014: 80) again counters that the cultures in the area remained distinct despite constant contact (and conflict), accepting, for example, new technologies,

[80] De Wolf (1994: 182) states that "the terms for cardinal points - as rather important representatives of the cultural vocabulary of a people - can give us information about cultural contacts and in some cases about the migration paths of the ancestors of the speakers of a language" (my translation).

practices and artefacts but adapting and reproducing them in line with locally relevant cultural contexts. This scenario echoes the social constructionist view regarding the nature of technology, and indeed such an analysis might favour the use of existing terms or neologisms over terms from neighbouring ethnolinguistic groups.

The variation and multiplicity of terms, coupled with the lack of loanwords in the domain of metallurgy, might lead one to question the validity of an argument for the diffusion of the technology from South America to West Mexico. Certainly "[…] the idea of multiple sources and multiples centres of secondary dispersion [of metalworking in Black Africa] is altogether plausible, especially in the light of the linguistic complexity […] in connection with metalworking vocabulary" (Herbert, 1984: 9). We may wish to consider, then, whether the sheer variety of forms found for metallurgical terms in the three regions of extractive metalworking in the prehispanic Americas may also be due to multiple sources and centres or production (see, e.g. de Grinberg, 1990). Such a scenario, coupled with the largely non-verbal nature of knowledge transfer, may help to account for the linguistic data observed in this sample, although cannot be confirmed at this stage.

3.6. Conclusion

This chapter has shown that the lexicon of metallurgy, in this sample at least, is not able to demonstrate evidence of contact at the macro-level between South America and West Mexico to the extent that data in archaeology and genetics have. At the regional level, it has highlighted different patterns of lexical diffusion, with the Andes displaying more widespread borrowing compared with the other two regions. Certain naming strategies for terms, such as the colours for metal terms, follow similar patterns but seem to display no particular regional biases. This finding echoes Lechtman's (2007: 344) statement that "Precolumbian metallurgy was Pan-American", in the sense that it shared certain salient features. These features were (i) an emphasis on the development of specific colours or colour ranges in metals and alloys (as well as for gems and other precious stones), (ii) a stress on shininess, reflectivity, and the iridescence of metallic surfaces, following Saunders' (2003: 20) "aesthetic of brilliance" that also applied to other natural resources and objects, and

(iii) the predominant use of copper, silver and gold and their alloys. These production and stylistic similarities are then adapted to individual cultural contexts, encouraging the diversity – or 'diffuse unity' in the Chibchan sense – observable across the metalworking regions.

As indicated in Section 3.5, the small amount of borrowing may be due to knowledge transfer practices in non-industrialised societies, and everyday situations more generally, where the non-verbal takes precedence over the verbal. Given that patterns have emerged at the regional level of analysis in this study, it is worth recalling Geurds and Van Broekhoven (2010: 68), who state that the analysis of social interaction, of which linguistic interaction is clearly a part, should include "an appreciation of localized processes of development at the level of technology, material procurement and semiotic patterns before the regional system can be elucidated." As such, future linguistic investigations could benefit from a more post-processual approach, focussing on more micro-level situations, before trying to address the larger-scale questions of long-distance interaction, if indeed such questions continue to be worthy of further investigation.

In the following chapter I explore the possibility that language contact occurred between Purepecha speakers and other speech communities on smaller scales than the long-distance scenario studied here, in a similar vein to the areal borrowing observed in the Andes.

4. PERSPECTIVES ON LANGUAGE CONTACT[81]

"Constantly fails the exam? I'd hardly call eleven times 'constantly'. I mean, if you eat roast beef eleven times in your life, one would hardly say that person constantly eats roast beef. No, it would be a rare, nay, freak occurrence."
(Rimmer to Lister, 'Waiting for God')

Abstract

Purepecha (isolate, Mexico) displayed remarkable resistance to lexical borrowing prior to the arrival of Spanish-speaking colonialists in 1521, despite being in contact with up to 20 other languages. From the pre-colonial period, only a small number of loans can be identified. These can be classified either as pan-Mesoamericanisms, found in many languages of Mexico and of Nahuatl origin (see Brown, 2011), or pan-Americanisms (notably kinship terms), whose forms may reflect more universal phonetic tendencies or - perhaps - a much older genetic relationship (see Swadesh, 1967). Since the imposition of Spanish, Purepecha has accepted a large number of loanwords from the dominant language, and this prolonged contact has also led to some structural changes (see also Chamoreau, 2007). In this chapter, I investigate the changing face of language contact using lexical data in the form of the World Loanword Database (WOLD) wordlists from the main languages known to have been spoken in the Tarascan State, examples from Purepecha-influenced Spanish from the *tierra caliente* of Michoacán (see Meneses, 2016), as well as my own fieldwork data on the language of perception. In so doing, I discuss the differences in borrowing patterns between the two periods (pre-colonial and colonial/post-colonial) and at different spatial levels of interaction, focusing on how the changes to the socio-political position of the Purepecha language and its speakers have led to such a marked difference in the acceptance of non-native forms into the language. The lack of

[81] Parts of this paper appear, in highly abbreviated form, as: Bellamy, Kate. 2016. Language as a mirror for social change, The Linguist @ NTNU, http://www.eng.ntnu.edu.tw/files/archive/2152_43f077c5.pdf.

borrowing in the pre-colonial period could also suggest that functional bilingualism was not the norm, or that a strict diglossic situation was present.

4.1. Introduction

The findings in Chapter 2 indicate that there is no convincing evidence to link Purepecha genealogically with another language or language grouping in Mesoamerica or South America. Similarities are confined to individual lexical items but systematic phonological correspondences are simply not observable, as exemplified by the results of the Oswalt Monte Carlo Shift Test (see Section 2.3). Moreover, the lexicon of metallurgy - the most convincing archaeological domain for possible interaction between the Andes and West Mexico - does not offer any evidence of long-distance borrowing between languages in the two areas. While this finding does not deny the possibility of interaction between speakers of these languages, when combined with the lack of clearly identifiable loans in basic vocabulary, it does suggest a weak or sporadic contact scenario, if any. Alternatively (or also), the lack of loans in Purepecha in particular may point to a certain resistance to borrowing in the language, and therefore on the part of the speakers, a point to which I return in Section 4.4.[82]

Yet the lack of evidence linguistic relatives and contact effects presented in Chapters 1-3 seems to pose more questions than it answers. Such questions include: how big was the language family we might hypothesise Purepecha was a branch of? Where were its linguistic relatives spoken? When did the languages split from their common ancestor? When did the related languages die out? And what was the distribution of these languages? Even though the language is an isolate, its speakers have certainly not lived in isolation, which is to be expected, since no language community ever does naturally for more than a couple of hundred years at most (Thomason, 2001: 8). The Americas are something of a hotbed of isolates, being home to around two-thirds of the world's languages that cannot be demonstrably linked to

[82] A third scenario is that terms were borrowed initially but have since been replaced with native words. Due to the lack of documentation dating back to the time of proposed interaction perhaps mediated by metallurgy (c. 650-1200 CE), it is extremely difficult to investigate such a proposal.

any other language(s). Language isolates are in part the inevitable product of a lack of written documentation, a particularly acute issue in historical-comparative linguistics in the Americas. Nonetheless it is still possible to investigate the history of such languages using means such as internal reconstruction, toponyms, personal names, evidence from loanwords, and language contact or areal linguistics (Campbell, 2010: 8). Given the largely comparative focus of this thesis, I will focus on the final two of these approaches, addressing contact between speaker groups and possible resulting bilingualism from different spatial and temporal perspectives.

Some archaeologists (notably Gorenstein & Pollard, 1983) and historians (see Gerhard, 1993 [1972]) have stated that multiple languages were spoken by the inhabitants of Michoacán during the existence of the Tarascan State and in to the early colonial period. We could therefore expect to see evidence of interaction between speakers of these different languages in Purepecha, as well as traces of Purepecha in the other language(s) in contact. Building on the findings from Chapter 3, we might speculate that if Purepecha shows virtually no effect of contact in the domain of metallurgy, does it show traces of contact in other domains? And if so, are some domains more open to integrating loanwords than others? Orthogonal to the questions related to the domain of borrowing are those related to the chronological side of borrowings, namely has the intensity and type of borrowing (if it occurs) remained relatively stable, or can different patterns be observed at different time periods (cf. Nichols, 1992)? If differences are evident, then what socio-political-economic factors have contributed to the situation at hand (see Thomason, 2001)? I will attempt to answer, at least partially, some of these questions in this chapter.

The rest of this chapter is structured as follows: in Section 4.2 I dig deeper into the issue of prehispanic multilingualism in Michoacán, reviewing what is known of cultural and linguistic diversity in this period on the basis of archaeological findings and colonial census reports. In Section 4.3 I present a three-way spatial typology of language contact scenarios for Purepecha, focussing on the long-distance, medium-distance and regional contact scenarios in the three subsequent sub-sections. I move on to differences in language contact effects over time in Section 4.4, offering examples of lexical and structural borrowing in Purepecha from Spanish in the

modern language. Possible socio-political explanations for the patterns observed in Sections 4.3 and 4.4 are presented in Section 4.5, where I draw together the findings from different perspectives.

4.2. Multilingual Michoacán

Modern-day Michoacán is multilingual insofar as Purepecha speakers almost without exception also speak Spanish (but see INEGI, 2010), and the small number of Nahuatl speakers residing in four municipalities in the coastal region (Hangert, 2004: 23) are also bilingual with Spanish, but do not speak Purepecha. However language diversity in the state is a mere shadow of its former, precolonial self. From the *relaciones geográficas* 'geographical surveys' collected by Spanish administrators, whose earliest surviving example for Michoacán dates to 1523-4 (see Warren, 1963), it is evident that over 20 languages besides Purepecha were spoken in what was then known as a province in the vice-royalty of New Spain, now roughly the state of Michoacán (see Gerhard, 1993 [1972] for a compilation of the surveys for all of New Spain from the sixteenth to the eighteenth centuries). These languages, together with their language family affiliation (where known), are presented in Table 15. The entry 'unclassified' in the second column often entails that the affiliation is unclear or untraceable. That over half of the languages listed here (12/22) are unclassifiable highlights one of the key issues in historical linguistics in the Americas highlighted above, namely a lack of primary documentation that would provide not only textual material for use in comparative studies, but also identifying information in secondary sources that would at least enable us to offer a genealogical affiliation.

Language	Affiliation	Notes
Apaneca	Unclassified	
Aquilan	Unclassified	Spoken on the coast
Chichimec[83]	Oto-Manguean	Likely Pame or Chichimeca-Jonaz
Chontal de Guerrero	Unclassified	Not to be confused with other 'Chontals' in Mexico, e.g. de Tabasco
Chumbia	Unclassified	
Coca/Tachtoque	Unclassified	
Cuauhcomeca	Unclassified	Spoken inland
Cuicatec	Oto-Manguean	
Cuitlatec	Isolate	Extinct, formerly of Guerrero coast
Epateca	Unclassified	Spoken on the coast
Huahuan	Unclassified	Spoken on the coast
Maquilan	Unclassified	Spoken on the coast
Mazahua	Oto-Manguean	
Mexicano tosco ('rough Mexicano')	Uto-Aztecan	Coastal lingua franca, Nahuatl
Montintlan	Unclassified	Spoken on the coast
Nahuatl varieties	Uto-Aztecan	Xilotlantzinca, Sayulteco, Coixca, Tepuzteco (aka Chinantec?), Tiam, Tamazulteco and Zapotlanejo varieties
Otomí varieties	Oto-Manguean	Amultecan, Bapame, Pino and Zapoteco
Panteca	Unclassified	
Piñol/Pino	Oto-Manguean?	Otomí variety (?)
Pinome	Uto-Aztecan	Also known as Cora
Pirinda[84]	Oto-Manguean	Also known as Matlatzinca
Tolimeca	Unclassified	

Table 15: Languages spoken alongside Purepecha in the early colonial period (following Gerhard, 1993; Brand, 1943)

[83] Chichimec is a pejorative term that Brand (1943: 55) states should not be used to refer to a language. I include it here in order to remain faithful to the entries in the *sumas* 'censuses' brought together in Gerhard (1993).

[84] Pirinda speakers from the Valley of Toluca sought refuge from the Aztecs in Michoacán during the late 1400s. They were excellent warriors and contributed greatly to the Tarascan *cazonci's* power, having been recruited by the leader Characú when he needed more soldiers for his campaign. In return for their support, he gave them the towns of Tiripetío and Indaparapeo. At the time of conquest they formed the frontier guard for the Tarascan State.

A visual representation of the languages presented in Table 15 can be observed in Figure 9. The clear borders between languages on the map suggests that there was only one language spoken in each delineated region, yet the census data collected in the *relaciones geográficas* clearly contradicts such a situation (see Appendix F). Multiple languages were recorded in a single *provincia* (an administrative jurisdiction roughly analogous with a modern town or village) at any one period and their coexistence may have been indicative of bilingualism or multilingualism on the part of at least one group residing in a given location.

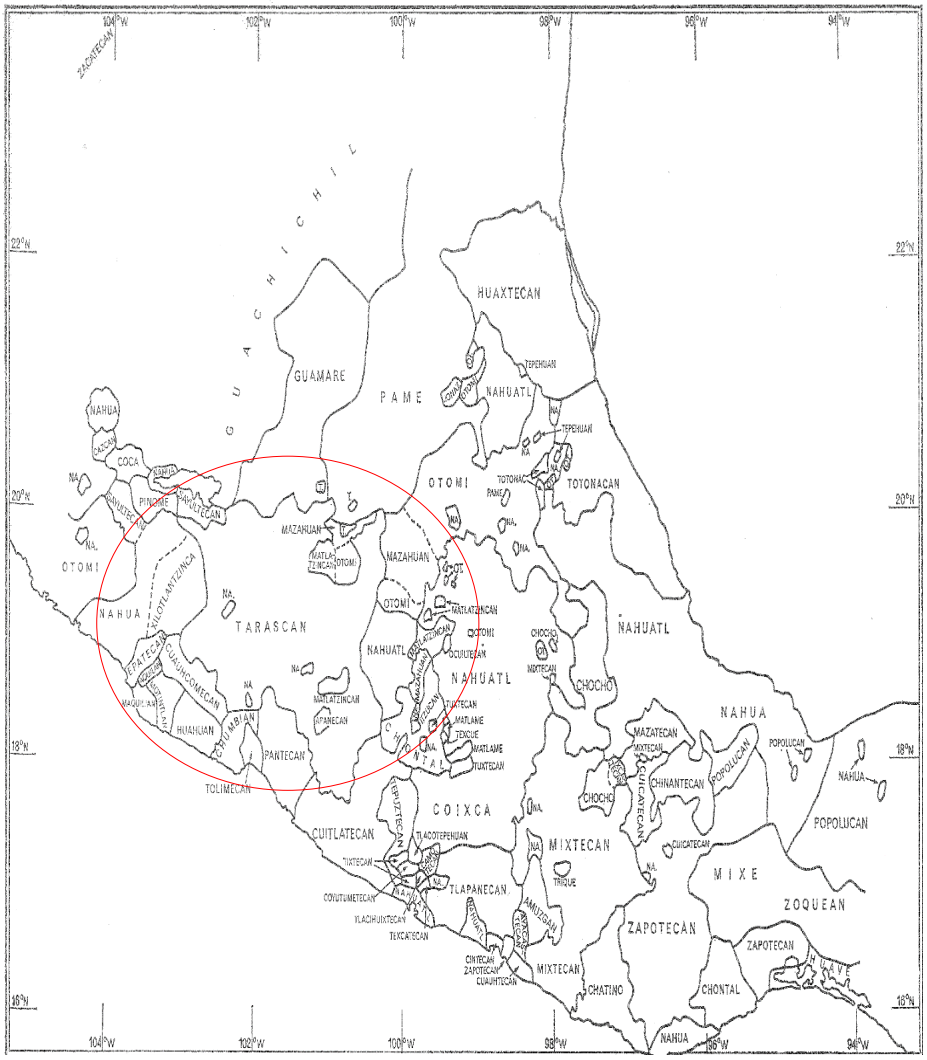

Figure 9: Languages spoken in Mexico in 1519 (from Gerhard, 1993: 6), with the approximate area of the Tarascan State circled in red

Additional support for a prehistoric multilingual situation stems from the response to the imminent arrival of the Spanish in 1522. Prior to the invasion of Michoacán by de Olid's 200-strong band of men, the groups that supported the *cazonci*, namely the Matlatzinca, Otomí, Huetama, Cuitlateco, Escamoecha and Chichimeco, assembled to discuss how to proceed. Timas, a powerful Michoacán warlord, persuaded the

cazonci to kill his own brothers and incited him to also commit suicide shortly before de Olid and his troops arrived. One assumes that the representatives of the different groups were able to communicate with each other, possibly using Purepecha as a *lingua franca*, indicating some form or bilingualism or multilingualism. This ability to interact may be one of Suárez's (1983: 159) "several facts [that] point to a situation in which linguistic contacts were primarily among the upper classes and that their potential effects reached lower groups only sparingly." I will now move on to look at how Purepecha interacted with other languages in the Late Postclassic and Protohistoric (i.e. early colonial) periods within the confines of what was the Tarascan State more specifically.

4.2.1. Multilingualism in the Tarascan State

From around 1000 CE onwards, a number of hunter-gatherer groups migrated to Michoacán from territories further north. These groups settled in discrete communities in and around the Lake Pátzcuaro basin, joining the existing Purepecha-speaking population (see Section 1.3). According to the archaeologists Gorenstein and Pollard (1983: 111), during the Late Postclassic period (c. 1350 - 1521 CE) four ethnolinguistic groups were residing in the Pátzcuaro basin, namely: (i) the indigenous basin-dwellers, also labelled Proto-Tarascans;[85] (ii) *naguatatos*, Nahuatl speakers, who had been mostly deer hunters prior to their migration;[86] (iii) a first Chichimec group that arrived earlier and lived on the islands in Lake Pátzcuaro, and (iv) a second Chichimec group, the *Wakusecha* 'eagle warriors' from Zacapu, from which the *cazonci* 'chief' of the Tarascan State was descended. The relationships between different ethnolinguistic groups became particularly important with the founding of the Tarascan State in 1325 CE. Speakers of the various languages previously spoken in the modern-day states of Michoacán, Guerrero, most of Jalisco, and some of

[85] Gorenstein & Pollard (1983: 115) claim that these proto-Tarascans also spoke Proto-Purepecha, a claim which is difficult to substantiate in the absence of written documentation prior to the sixteenth century. It is also not clear what they mean by 'Proto-Tarascan', since the language seems to have changed little in the intervening 500 years, thereby making a claim that this is an earlier stage of the language somewhat harder to justify. However, as archaeologists, it may be that they are using this term as a label for an older variety of the language rather than a proto language in the strict [historical] linguistic sense.

[86] This group also functioned as interpreters for the Tarascan leader in his dealings with the Aztecs and later with the Nahua-speaking Spaniards, see Section 1.3.

Guanajuato were incorporated into the Tarascan State where, Pollard (2015: 108) claims, Purepecha was established as the dominant language.

The Pátzcuaro basin was thus home to several ethnolinguistic groups who were politically autonomous and socially differentiated before the emergence of the Tarascan State. Each of these ethnolinguistic groups differed in terms of its system of social stratification or class, their degree of economic specialisation as well as their access to irrigable land (Williams, 2018: 22). However, the social system in the Tarascan State was unified by the protohistoric period (around the time of contact), thanks to a highly effective, centralised administrative system. Through a rapid process of cultural assimilation and political unification, these different groups all converged on a 'Tarascan' identity, which included use of the Purepecha language (e.g. Pollard, 2015)[87]. This newly constructed common identity cross-cut ethnolinguistic affiliations and social class (Gorenstein & Pollard, 1983: 111). We may add Albiez-Wieck's (2011: 16) observation that there was no difference in the material culture of the different ethnolinguistic groups living in the Tarascan State as further evidence of a largely unified society. In support of this statement, Pollard (2008: 225) claims that "the regional continuity in the material culture and ideology was matched by a continuity in language and that Purepecha was spoken throughout these two millennia [i.e. the two millennia prior to contact with the Spanish] in central and northern Michoacán". This use of Purepecha may have taken the form of a *lingua franca* between the different groups in both the precolonial and early colonial periods, and may also have constituted a way of constructing or strengthening a common cultural identity. In other words, the introduction of several small migrant groups speaking different languages seems to have had no detrimental effect on the use of Purepecha (Pollard, 2000).

Yet while a common cultural identity may have prevailed in Late Postclassic Michoacán, linguistic diversity seems to have remained. This may have been reinforced by the ethnic assimilation and segregation that occurred within the Tarascan State, leading to a series of ethnic zones around Lake Pátzcuaro that

[87] This claim is problematic given that it is based solely on a socio-political interpretation of archaeological evidence.

dominated community interaction (Gorenstein & Pollard, 1983). The multilingual situation described in Section 4.2 is implicit in Gorenstein & Pollard's (1983) ethnolinguistic groupings outlined above, yet has never been explored from a linguistic perspective, save for the collection and analysis of toponyms, largely as indicators of the extent of influence of a given group in the region (see notably Lefebvre, 2017). Indeed it is noteworthy that the most northerly Purepecha toponyms are found in San Luis Potosi and Jalisco, the former being several hundred kilometres from Michoacán. Purepecha toponyms are particularly identifiable by their termination in *-ro*, the nominal case marker for location, as in the city of Queretaro (see Section 4.4.1).

As such, it appears that the term 'Tarascan' used by both the Spanish invaders and modern-day scholars is shorthand for a more complex state of social affairs, since the 'Tarascans' did not constitute a single ethnolinguistic group prior to conquest. Yet the extent to which the Purepecha and the other ethnolinguistic groups residing in the Tarascan State were multilingual, and could therefore mutually influence each other linguistically, remains unclear from the existing literature. Gorenstein and Pollard (1983: 167) offer the following astute observation regarding interaction between ethnolinguistic groups in any given society:

> "It is often assumed that if two societies are contemporary and geographically relatively close, communication between them is high and unrestricted. But the degree and nature of communication and exchange between populations of independent states is a function of both the military/political relations between them and the ability of central authorities to control interactions across their borders" (Gorenstein & Pollard, 1983: 167).

In this vein, Thomason (2001: 66) offers three main social predictors for the results of language contact between two groups, namely: (i) intensity of contact[88]; (ii) relative

[88] Intensity of contact is not clearly defined by Thomason (2001), rather she acknowledges that intensity can be defined in different ways, relating to, for example, the duration of contact, or the amount of cultural pressure from one group on another. I take more intense contact situations to be longer in duration, since

size of the groups involved; and (iii) socioeconomic dominance. Generally speaking, and it should be emphasised that these are only general tendencies, longer contact scenarios tend to result in a larger number or more profound changes, the larger group tends to exert more influence over the smaller (i.e. the latter takes on more linguistic features from the former than vice versa), and the more dominant group tends to exert more social and linguistic pressure, so the subordinate group is more likely to adopt features of the stronger one. Given that the Tarascan State was strongly centralised politically, with social stratification cross-cutting ethnolinguistic affiliations, with obvious enemies shared by all (namely the Aztecs), one might assume a relatively high amount of interaction between the Purepecha and other groups at this time (contra to Suárez's (1983) position, mentioned above, that interaction only occurred at the higher social levels). This interaction could be identified linguistically through the presence of loanwords from Purepecha in the other, less dominant, languages. However, given the geographic separation and occupational specialisation of groups within the same settlement (Gorenstein & Pollard, 1983), we might also expect an influence on Purepecha, likely in specific semantic domains, especially those which may pertain to activities carried out by particular groups, or in relation to trade. In the following two sections, I will pursue this idea more systematically, from both spatial and temporal perspectives.

4.3. Language contact across space

While the linguistic relatives of Purepecha remain unknown, indications of contact between Purepecha and speakers of other languages can be identified at three main spatial, or geographic, levels: (i) long-distance, or diffusional, namely between the Andes and Pacific coast of South America and Michoacán (and other parts of West Mexico), through maritime contact largely promulgated by the transfer of metalworking technology (Hosler, 1994; Anawalt, 1992; see also Brucato et al. 2015); (ii) medium-distance, or areal, that is at the level of Mesoamerica in the form of a linguistic and cultural area borne out of interaction and trade from the Olmec period

longer contact periods allow for the possibility of more contact features being transmitted between generations.

(c. 1200 - 500 BCE) through to the time of conquest (Campbell, Kaufman & Smith-Stark, 1986; Kirchoff, 1960 [1943]); and (iii) short-distance, or regional, which corresponds to interaction within the territory of the former Tarascan State, thus Michoacán plus parts of the neighbouring states of Guerrero, Jalisco and Guanajuato. While the findings in Chapter 3 suggest that there is limited evidence for long-distance interaction as far as the lexicon of metallurgy is concerned, I will concentrate here on diffusion of a different semantic domain: kinship. I will also examine contact at the areal and regional levels in more detail.

4.3.1. Long-distance contact revisited

In Chapter 3 it was concluded that the lexicon of metallurgy cannot offer any support for the hypothesis that long-distance interaction occurred between the Andes and coastal northern Peru and Ecuador, and Michoacán, as part of West Mexico more generally, from around 650 CE onwards. Moreover, on the basis of a quantitative analysis of Swadesh 207 basic vocabulary wordlists for Purepecha, Quechua, and other languages that have previously been proposed as possible linguistic relatives, no evidence could be found to support a relationship beyond the level of chance correspondences (see Chapter 2). The most suggestive of these chance correspondences, in terms of both form and meaning, is the term for 'woman, wife', namely Quechua *warmi* and Purepecha *warhi.* Indeed it is worth noting here that both Purepecha and Quechua possess a number of kinship-related terms beginning in *wa-*. In Purepecha we find, for example, *wachiku* 'the very first-born (whether or not it lives)', *wampa* 'husband', *wap'a*, *watsi* 'child, son, daughter, boy, girl', *wawa* 'paternal aunt', while in Quechua (here from the Ayacucho variety; Parker, 1969) there is *warma* 'boy, girl, approx. 5-10 years of age', *wawa* '(woman's) child, baby', *wawqi* '(man's) brother', *wayna* 'young man, lover' (see also the examples in Swadesh, 1957: 16). However, aside from the first syllable (i.e. the root), which is common to both languages and might suggest a historical primary meaning relating to family relations, there is little in the way of direct correspondence. For instance, *wawa* in Purepecha refers to a paternal aunt, while in Quechua the referent is a '(woman's) child or baby'. The ubiquity of the syllable *wa-* in both languages,

especially in word-initial position also weakens the argument for these similarities being any greater than chance. Moreover, Emlen (2017: 336) identifies **wa* as aProto-Quechua root that has to do with 'hanging, tying, or pulling', a meaning far removed from any notion of kinship relation. In the absence of an internal reconstruction of previous stages of the language, data for modern Purepecha (notably Friedrich's unpublished dictionary) indicate that the root *wa-* refers to notions of 'hitting, beating, shaking off or down'. Thus the meaning of the roots in the two languages does not overlap, but the shared presence of kinship lexemes formed with this root with hugely different semantics remains somewhat suggestive.

Numerous similarities in kinship terms across the Americas were first noted by Swadesh (1957), in his second abortive attempt to prove a genealogical connection between Purepecha and Zuni, an isolate spoken in New Mexico, USA (see Section 2.2.1). The cognate candidates presented in support of this relationship (Swadesh, 1957: 10) are too poor to merit inclusion here, but correspondence sets based on 13[89] mono- or disyllabic roots for multiple languages and language families of the Americas, including Purepecha and Zuni, seem to highlight potential continent-wide correspondences in this semantic domain. Take, for example, forms in *ȼi-* [tsi], a sample of whose proposed reflexes in ten other language families of Meso- and North America can be observed in (1). Note that some language names have been changed to reflect the Glottolog 3.0 classification (Hammarström, Forkel & Haspelmath, 2017).

[89] Note that five of the 13 roots constitute open syllables including a labial consonant and an open front unrounded vowel, namely: ma/mi, na, pa, ta, and wa. I find these unconvincing examples of areal terms for two main reasons: (i) such sounds/syllables also occur in the European languages that have been imposed in the Americas, e.g. Spanish *tata* 'uncle', rendering their origin unclear; (ii) related to (i), these syllables are often attested in reduplicated forms by Swadesh, suggesting an origin in babytalk. Swadesh (1957: 18) himself admits this is a possibility that cannot be discounted.

(1) Purepecha (isolate) *¢ə¢ə́*[90] ‘mother’s sister’
Zuni (isolate) *¢itta* ‘(older sister of) mother’, *¢ilu* ‘mother’s younger sister’
Totonac (Totonacan) *¢iʔ* ‘mother’
Texistepec Popoluca (Mixe-Zoque) *¢əə́¢ə* ‘older sister’
Tapachultec (Mixe-Zoque) *ʔacuk* ‘younger sister’
Oluta Popoluca *caci* (Mixe-Zoque) ‘mother’
Huave (isolate) *ciig* ‘sister’, *ncey* ‘mother’s parent’
Yucatec (Mayan) *cic* ‘mother’s mother’[91]
Nisga’a (Tsimshian) *-c’ec’* ‘mother’s parent’
Southern Coastal Tsimshian (Tsimshian) *-c’ ic’* ‘mother’s parent’
Northern Foothill Yokuts (Yokutsan) *-sos* ‘father’s sister’
Huichol (Uto-Aztecan) *¢ə¢ə* ‘respected woman’
Bannock (Uto-Aztecan) *hu¢i* ‘father’s mother’
Caigua[92] (Kiowa-Tanoan) *¢aayuʔi* ‘father’s sister’
Towa (Kiowa-Tanoan) *¢eʔe* ‘mother’
Isleta (Kiowa-Tanoan) *ciʔi* ‘mother’s mother’
Mazahua (Otomanguean) *zizi* ‘mother’s sister’
Mixtec (Otomanguean) *c’iši* ‘father’s sister’
Wichita (Caddoan) *ʔa¢ia* ‘mother’ (informal)

While in Purepecha, Zuni and Mazahua[93] the term refers to ‘mother’s sister’, in Northern Foothill Yokuts, Caigua and Mixtec it corresponds to ‘father’s sister’. Six other languages reflect the term for ‘mother’ through the reflex, three more refer to a

[90] In the updated orthography used in this thesis, this term would be represented as *tsïtsï* but I have retained Swadesh’s original entries here.
[91] Swadesh also gives icil *çuç* ‘mother’ for Yucatec but this is incorrect. The standard form for ‘mother’ is *na’* (Bastarrachea, Yah Pech & Briceño Chel, 1992).
[92] This language name does not appear in Glottolog, although Simons and Fenning (2017) offer the following alternate names for Kiowa: Cáuigù, Cáuijò:gyà, Gaigwu. It is likely, therefore, that Caigua here refers to the Kiowa language.
[93] Swadesh (1957: 28) suggests that the Mazahua form is a loan from Purepecha, which is a plausible interpretation.

sister of some kind, with six in total referring to a mother or father's mother, father, or generic parent. Nevertheless, despite the slight differences in semantics, all of the lexemes in (1) seem to represent a concept of older, more respected female.

The root *ȼi/ci/zi* is clearly visible in all of the forms presented in (1). It is perhaps surprising that this phonological signal can be identified from British Columbia (Canada) in the north, where Southern Coastal Tsimshian is spoken, to Oaxaca (Mexico) in the south, the location of the remaining Huave speakers. Swadesh (1957: 35-37) claims that the phonological similarities observed for all 13 roots, irrespective of their frequency and use in child language, reinforce his theories of the genetic unity of the Penutian language family (perhaps better thought of as a "set of working hypotheses" than a distinct genealogical grouping (Mithun, 1999: 308)), and the relationship of Purepecha to Zuni, as well as to other languages in the Arizona and New Mexico via Zuni. My interpretation of the correspondences is, however, somewhat more cautious. Indeed an alternative hypothesis could be that lexical similarities between such a large number of languages, whose genealogical position is much better established now than it was when Swadesh published the original data, are more suggestive of a shared history of some kind amongst these languages that is more likely to be grounded in convergence rather than relatedness, and to have occurred over a prolonged period of time. In a similar way to how personal pronouns with first person /n/ and second person /m/ are indicative of a shared history of languages of Pacific Northwest languages (see Nichols & Peterson, 1996), although not necessarily of genetic relatendness, these terms may offer a snapshot of the prehistory of languages of North America and Mesoamerica, albeit one that has faded due to age.

4.3.2. Medium-distance contact

The results of prolonged contact at the medium-distance level– that of Mesoamerica – were first presented in the form of a cultural area by Kirchhoff (1960 [1943]), following in the footsteps of the early twentieth century North American diffusionists such as Kroeber and later Boas (Muysken, 2008). Kirchhoff's Mesoamerican cultural area was based on "a shared set of cultural traits brought about by thousands of years

of diffusion and migration within Central America" (McGuire, 2011: 2). Cultural traits supporting this construct include a sedentary way of life, maize agriculture, monumental construction, the use of two calendars, a base 20 number system, pictographic and hieroglyphic writing systems, and a common body of religious concepts. While the prehispanic Purepecha possessed many of these traits, it is important to note at this juncture that they also demonstrated considerable intellectual independence from the rest of the region. Notably, their use of the Mesoamerican calendar system differed, they possessed no known writing system (but see Olmos, 2010 for an interpretation of Tzintzuntzan petroglyphs as a form of graphical communication), and their religion revolved around key deities, such as Xaratanga and Kurikaweri, rather than being based on the traditionally posited common Mesoamerican principles such as duality and the presence of male and female deities (Evans, 2004: 434).

We also find one of Kirchhoff's cultural traits re-emerging in the definition of Mesoamerica as a linguistic area, namely the base 20 counting system. The other four diagnostic linguistic traits for the proposed Sprachbund are: (i) nominal possession of the type 'his-dog the man', (ii) relational nouns that express locative and related notions, comprising a noun root and possessive pronominal affixes, (iii) non-verb final word order, and (iv) several widespread semantic calques (Campbell, Kaufman and Smith-Stark, 1986: 555). However, Purepecha possesses only one of these traits, namely the vigesimal counting system. It should be noted that this is not a strong diagnostic trait either, given its prevalence both within and outside of the linguistic area, as well as in many other areas of the world, e.g. Papua New Guinea and West Africa (Comrie, 2013). Moreover the term vigesimal is something of a misnomer; the Purepecha numeral system should more accurately be termed a hybrid quinary-decimal-vigesimal system. There are monomorphemic terms for five, ten and twenty, but all the intervening numerals are compounds constructed first from a five base and later from ten, as evidenced in *yumu tsimani* 'seven' (lit. 'five two') and *tempeni ka yumu t'amu* '19' (lit. 'ten and five four'. A similar situation prevails in, *inter alia*, Guerrero Nahuatl, State of Mexico Otomí, Central Pame, Copainalá Zoque, and Tzeltal Mayan, all of which display more internal structural diversity in their

numeral systems than the overarching label 'vigesimal' would suggest.

Moreover, Purepecha possesses only two of the 55 semantic calques or loan translations observed in many Mesoamerican languages (Chamoreau, in press) that are also held up as an indicator of membership in the Mesoamerican linguistic area (Campbell, Kaufman & Smith-Stark, 1986: 553). However, these terms - 'alive' and 'awake' - come from the same root (*tsi-)*, and there is an association between the forms used to refer to 'edge' and 'mouth, lip', namely the locative space suffix *-marhi*. As such, Purepecha can be considered a peripheral member of the linguistic area, if it can be included in this areal grouping at all (Chamoreau, in press; Smith-Stark, 1994). This outlier status implies that the contact Purepecha speakers had with other groups within Mesoamerica may not have been that intense, even though it has been claimed that Purepecha has been spoken in Michoacán for the past two millennia (Pollard, 2015: 109), and that cultural influence from Central Mexico (i.e. the Aztecs and their predecessors) is evident in, for example, pottery styles, ceramic decoration, and statuaries (see also Williams, 2018). Moreover, the lack of clear contact effects on the language lends support to the claim that groups with more socio-political power are more likely to influence other languages rather than *vice versa* (Thomason, 2001). Since the Tarascan State constituted a well-organised, stratified, powerful socio-political system, it is easy to imagine how resistance to external influence in whatever form could emerge. Nonetheless, where interaction is postulated in archaeology, then it seems reasonable to assume social (and therefore) linguistic interaction of some sort (see also Chapter 3) which, depending on the type and intensity of such contact, may imply a certain amount of bilingualism. Bilingualism, in turn, could then lead to linguistic influence in the form of lexical and/or structural borrowing.[94] Having concluded that there is little evidence for such a contact situation at the medium-distance or areal level, in the next sub-section I will discuss whether interaction on a smaller scale, namely short-distance or regional, is evident in the linguistic record.

[94] Evidence from other areas in the Americas, such as the Vaupés basin in the Amazon (e.g. Epps, 2007) and the Isthmo-Colombian area between South and Central America (O'Connor, 2014), shows how the outcome of long-term contact and bilingualism may not be (substantial) lexical borrowing, but rather large-scale structural borrowing or grammatical convergence, motivated by the complex variables of language ideology and social norms. Since the interactional situation is far from clear in the contexts of Mesoamerica and the Tarascan State, I begin with lexical borrowing as a possible outcome of longer-term interaction.

4.3.3. Regional contact

In Section 4.2 I discussed the issue of multilingualism in prehispanic Michoacán. While the lack of written documentation prior to the mid-sixteenth century impedes investigation of such a topic, early Spanish census data, ethnohistorical sources such as the Relación de Michoacán, and the first dictionaries of indigenous languages of the region (e.g. Gilberti, 1559 for Purepecha) do provide indications of the contemporary linguistic and socio-political situation. These sources, combined with modern-day linguistic data, enable us to build up a partial picture of the interaction scenarios in action at that time, which can also be projected back to the immediately preceding period. With reference to linguistic data, lexical borrowing is often held up as the first (and sometimes only) type of contact effect visible in a language as a result of interaction with another language (e.g. Thomason, 2001; Moravscik, 1978; Swadesh, 1964). As such, in this sub-section I investigate more systematically whether the proposed interaction between Purepecha and the other languages spoken in the Tarascan State prior to the arrival of the Spanish (see Gorenstein & Pollard, 1983) led to lexical borrowing between pairs of languages and, if so, in which direction. Observable contact effects in the form of loanwords would indicate that the contact between the speakers of the languages involved was more than mere fleeting interaction, and rather involved mutual understanding, although not necessarily any bilingualism.

The method I adopted is as follows: I collected as many entries as possible of a 1603-term standardised wordlist of basic and non-basic lexemes) for ten languages. This wordlist was an expanded version of that used in World Loanword Typology Database (Haspelmath & Tadmor, 2009; Anthony Grant, pers. comm.; see also Sections 2.3 and 3.3 for discussions of the role of wordlists in historical comparative studies). The languages sampled in this study were identified as being, or having been, spoken in roughly what is now the state of Michoacán (formerly the Tarascan State and later incorporated into the vice-royalty of New Spain), following Gerhard (1993 [1972]) and Kaufman (2007). In addition to Purepecha, the sample comprised nine languages, including five Otomanguean languages, three Uto-Aztecan languages and

one other isolate, Cuitlatec; see (2) for the full list.

(2) Cuitlatec (isolate; extinct)
Otomí (Otomanguean)
Ocuilteco (Atzingo Matlatzinca; Otomanguean)
Mazahua (Otomanguean)
Chichimeco (Otomanguean)
Matlaltzinca (Otomanguean; extinct)
Michoacán Nahuatl (Uto-Aztecan)
Guerrero Nahuatl (Uto-Aztecan)
Cora (Uto-Aztecan)

On the basis of a comparison of the lexemes in these wordlists, one striking observation emerges: Purepecha shows very little evidence of borrowing from any of the languages in the list in (2), aside from a small number of loans originating from Nahuatl (see Section 6.5, however, for a discussion of possible morphological parallels in stem formatives in Ocuilteco). Indeed the only clear loans from Nahuatl in the REPLICA wordlist are *tukuru*[95] 'owl', *tianguis* 'market', and *misitu* 'cat'. The first term in this short list appears to be a direct borrowing from Nahuatl, since it can be reconstructed for Proto-Uto-Aztecan as **tuku* 'owl', which in turn has been borrowed from either Purepecha or Nahuatl into Otomi as *tukru* 'owl'. The second item in the list may be a Nahuatl loan that has entered Purepecha via Mexican Spanish rather than directly from the donor language, since it is commonly used in the latter. It is through this route that some Nahuatl loans are likely to have entered Purepecha, for two main reasons. First, the Tarascans and Aztecs were mortal enemies in the three centuries prior to the Spanish conquest, thus the likelihood of them maintaining anything more than minimal communication, probably revolving round trade, is low. Second, as a widely spoken language in Mesoamerica, including as a *lingua franca*, Nahuatl was learned by the Spanish administrative and religious representatives, and so managed to influence the European tongue from early in the colonial period. As a

[95] As Stubbs (2011: 276) also does, note the similarity to Mayan **tuhkur(u)* 'owl'.

result, numerous Nahuatl loanwords are present in both Mexican and European Spanish, some of which have also diffused into English, such as 'chocolate' from *xocoatl*, 'tomato' from *jitomate* (a fusion of *xictli* 'navel' and *tomatl* 'tomato'), and 'coyote' from *coyotl* 'carnivorous animal, similar to a fox'.

The final borrowed term in Purepecha, *misitu* 'cat', is found across Mesoamerica and bordering peripheral areas in phonologically closely related forms, and so can be considered one of several 'pan-Mesoamericanisms' (see Brown, 2011). Indeed Brown (2011: 183) claims that this term, along with at least five others[96], constitutes a widely spread post-contact lexical feature, that occurs in languages of the Mesoamerican linguistic area and certain languages in the peripheral regions, that was "almost certainly […] innovated only once by languages of the culture region". This strongly suggests that the terms diffused from a common source, likely Nahuatl, which therefore played a major role in the formation of the linguistic area, both before and after the imposition of Spanish language and culture.

As expected, there is some evidence in the REPLICA list of Purepecha as a donor language. The clearest example of the presence of Purepecha loanwords is in Cuitlatec (Escalante, 1962), a now extinct language isolate of coastal Guerrero, where we can observe borrowed kinship terms (3). The first entry in a line represents the Cuitlatec term and the second, after the less-than sign, the Purepecha source.

(3) *tahti* < *taati* ' father'
hwáhce (father speaking only) < *watsi tataka/nanaka* 'son/daughter'

Kinship terms are generally considered basic vocabulary, and thus less likely to be borrowed from one language into another (Tadmor, Haspelmath & Taylor, 2010; but see Section 4.3.1 for the discussion on the spread of kinship terms through the Americas). The fact that they have been borrowed in this instance may indicate that Purepecha exercised a strong influence on Cuitlatec. This influence may have taken

[96] The other five lexical features are: *tentzone* usually 'goat', *sheep*: 'cotton + some mammal', *bread*: '*castillan* tortilla', *chicken, hen (occasionally rooster*): '*castillan* turkey or bird'; and *wheat* (or, rarely, some other imported grain): '*castillan* maize'. None of these terms is attested in Purepecha and so they will not be discussed further.

the form of long-term contact, and possibly even intermarriage (although this is scarce evidence for this) and be indicative of Purepecha's more dominant social status in the region. The Cuitlatec verb *úSi* 'to work' may also be related to Purepecha *u-ni* 'to do, make', but this is somewhat speculative since the correspondence is so short.

Meneses (2016: 250, fn. 6) has also identified a number of terms in the Spanish entries of Hendrich's (1946) Cuitlatec wordlist that are clearly Purepecha in origin. These terms all belong to domain of regional vegetation and animals, such as *arápara* 'paper wasp', *capiri* 'type of tree', *corongoro* 'type of tree', *cuitáz* 'type of tree', *chamacúz* 'termite', *chucumpún* 'type of tree', *pinzán* 'type of tree', *sirián* 'type of tree and fruit', *turicata* 'insect' and *sícua* 'toasted maguey, mezcal'.[97] While Hendrichs (1946: 132) claims that there is little evidence of Purepecha influence on Cuitlatec, the impact of Purepecha on Spanish is intriguing and will be explored further in Section 4.4. Finally, the REPLICA wordlist also brought to light three loanwords in three different languages that may well be Purepecha in origin, see (4).

(4) Matlatzinca *inxapito* 'prawn' < *shapitu* 'prawn'
Ocuilteco *čhɨɨ* 'corn dough' < *tsïreri* 'dough, flour'
Cora *jatzí* 'seed' < *jatsiri* 'seed'

Note that all of the loanwords, in both directions, are nouns rather than verbs (with one speculative exception in Cuitlatec), a word class that requires less morphosyntactic adaptation to be borrowed into a language. Indeed, most borrowing is additive, in that it comprises new items, new nouns (M. Mous, pers. comm.). In sum, then, we have observed little lexical impact on Purepecha from neighbouring languages that were assumed to have been in contact during the precolonial period, but also little in the way of Purepecha influence on other languages. The question that immediately springs to mind at this point, therefore, is: Why is this the case? More specifically: what could account for the limited amount of lexical borrowing in the region? I return to this point, and more specifically the shifting face of socioeconomic

[97] Note that I have retained the orthography used by Meneses (2016), which reflects the original in Hendrichs (1946).

dominance in the region, in Section 4.5.

4.4. Language contact over time

Language ecologies do not remain static over time. With changes in the socio-economic and cultural lives of different speaker groups, and their concomitant changes in the type and intensity of contact, languages can influence – and be influenced by – other neighbouring languages in different ways during different periods. Similarly, as speaker groups can use different combinations of languages with varying levels of competence in different periods, so can individuals within those groups during their lifetimes (Grosjean, 2016). This situation also holds for Purepecha speakers. We observed in Section 4.2 that over 20 languages (or varieties) were recorded within the former Tarascan State during the first century of Spanish rule, yet it is clear now that Purepecha speakers in Michoacán are only confronted with one other language, namely Spanish. In this section I will focus on the increasing impact of Spanish on Purepecha in all aspects of language (phonology, morphology and syntax), using examples from my own language of perception data (see Chapter 6), as well as from other existing written sources.

Spanish has unquestionably had a major impact on the Purepecha language since the two first came into contact in 1521, an impact that stems from interaction in both informal and formal (e.g. educational) spheres. Despite Franciscan missionaries encouraging literacy in Purepecha in the early sixteenth century, widespread literacy in the indigenous language was never established (Hamel, 2008: 313; see also Section 1.6). In contrast, later colonial education policies focused primarily on forcibly assimilating the Purepecha (along with many other indigenous peoples of modern-day Mexico), both culturally and linguistically, through the direct imposition of Spanish in all grades in school (Hamel, 2013; but see, e.g. Bellamy & Groff (Accepted) for a lone counter-example to this policy). The ultimate result of these policies, coupled with forced population resettlements and a huge population decrease in the first hundred years following occupation, is unequivocal: the vast majority of the current estimated 125,000 Purepecha speakers are bilingual with Spanish. Across Mexico Spanish has been established as the dominant language of education, media,

communications and commerce. In Purepecha we can observe borrowings from Spanish for words of all classes, not just nouns as we saw in the late prehispanic/early colonial periods (see Section 4.2.1). Moreover, changes to word order and syntactic constructions such as comparatives have also been observed (see Chamoreau, 2012, 2007), although the shift from SOV to SVO word order may have begun under influence from Nahuatl prior to the arrival of the Spanish, or may only occur in certain varieties of Purepecha - we lack full grammatical descriptions for all varieties except for some in the Lake Pátzcuaro basin.

Differences in the type of language change can be classified according to Thomason's (2001; see also McMahon & McMahon, 2005) four main contact scenarios, which reflect varying degrees of intensity of contact, namely: casual, slightly more intense, more intense, and intense. The lexical borrowing we observed in precolonial times (Section 4.2.1) is typical of Thomason's first type of contact situation, casual contact, although it should be underlined loanwords can be transferred in all types of contact situation, not just this one. The words that are borrowed in these casual contact scenarios tend to be non-basic, that is more culturally-specific, nouns. The speakers of the two languages in contact do not need to be bilingual for this type of borrowing to occur - and we can probably assume that in this instance they were not. Since the Tarascans and Nahuatl-speaking Aztecs were in contact largely by way of trade and warfare, it is highly probable that only a small number of individuals from both groups was bilingual, leading to fewer opportunities for contact-induced change beyond the transfer of loanwords (see Section 4.3.3 for examples of how this casual contact affected the lexicon, or did not, as is more accurate).

In contrast, the current contact situation between Purepecha and Spanish displays effects associated with the second and third types of contact in Thomason's classification: slightly more intense and intense contact. Type two contact scenarios are characterised by the presence of loanwords in the recipient language that are not culturally specific, as in type one, and that belong to other word classes apart from nouns. For example *siempri* 'still, always' is used in Purepecha as an adverb in the same environments as its original Spanish. For this type of change to occur, a certain

amount of bilingualism is needed, therefore the contact must be more intense than in type one. In type 3 contact (intense contact) situations, all word classes can be borrowed, including verbs, nouns, adjectives, pronouns, numerals, as can morphological material such as suffixes. Word order may also be affected, where it differs in the two languages in contact. For borrowing of this type to occur, bilingualism must be more extensive than in type 2 (and type 1) situations and, it is claimed, attitudes towards the donor language should be favourable (cf. Epps, 2007 for an instance of contact-induced change through the back door, where resistance to lexical borrowing is high but structural convergence is commonplace). Let us now consider examples of lexical and morphosyntactic borrowing from Spanish in Purepecha, as a means of exemplifying the types of contact outcomes presented above.

4.4.1. Contact in the lexicon

Perhaps the most striking aspect of modern-day spoken Purepecha is the almost constant presence of Spanish loanwords. There is evidence of rampant borrowing of lexical items in all parts of speech, with varying degrees of phonological and morphosyntactic integration. This influence is not only the direct result of more technologically advanced and widespread communications, such as the use of mobile telephones and the internet in the past ten years or so, since many Spanish loanwords were already present in a language primer from the 1950s, as illustrated in Figure 10.

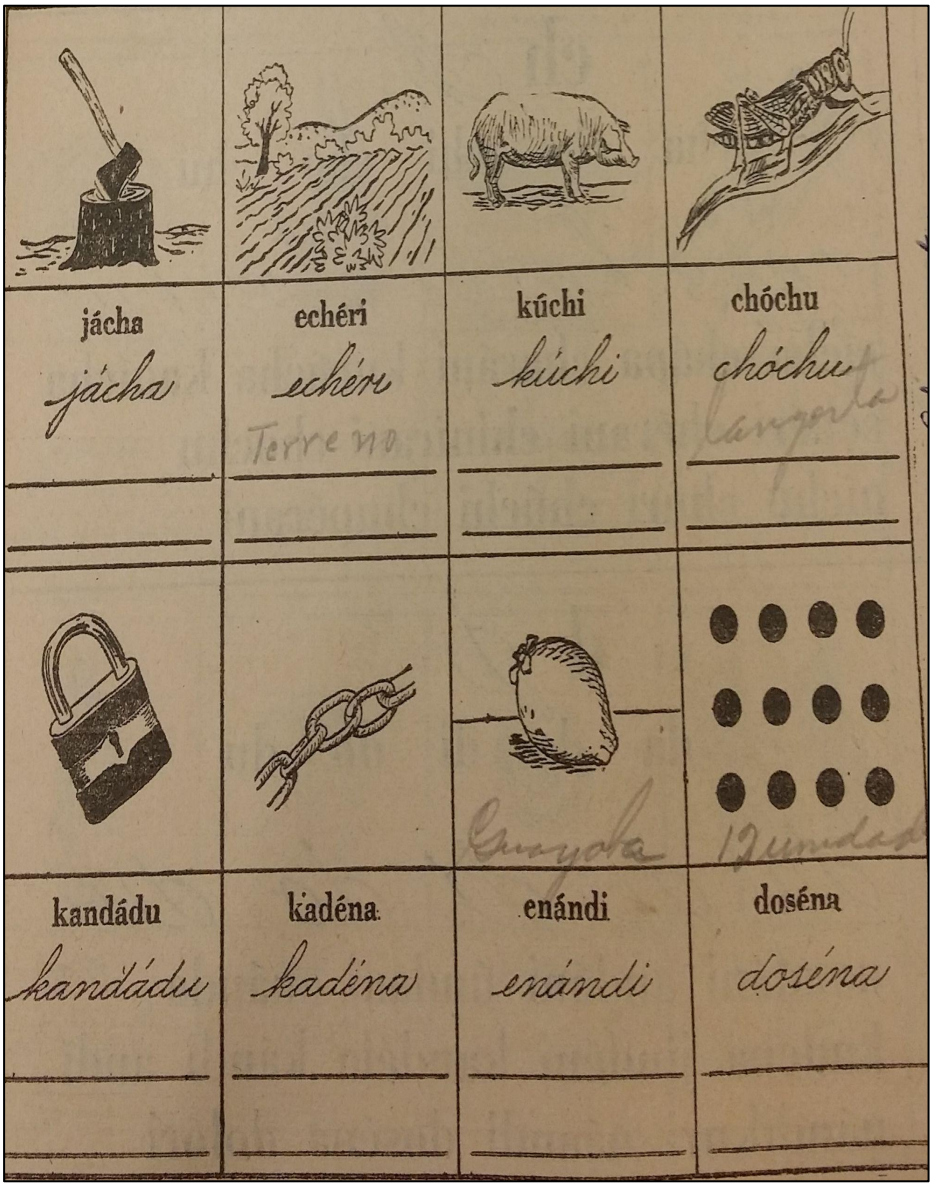

Figure 10: Excerpt from a Purepecha primer from the 1950s (courtesy of the Paul Friedrich Papers, University of Chicago Library Special Collections)

Of the eight nouns presented in Figure 10, five of them are Spanish loans, namely: *jácha* (Spanish *hacha*) 'axe', *kúchi* 'pig' (from *cochino* 'hog, boar, pig'), *kandádu* (a

phonological adaptation of *candado* 'lock'), *kadéna* 'chain' and *doséna* 'dozen' (both orthographic adaptations of *cadena* and *docena* respectively).

Moving forward to the present-day, in the language of perception recordings I made during three fieldwork trips from 2014 to 2016 (see Section 1.7), loanwords from a wide range of domains, such as food, household and technology, can be observed (5).

(5)

galleta 'biscuit'	*aceiti* 'oil'
chicli 'chewing gum'	*café* 'coffee'
pinoli 'pine [floor cleaner]'	*pintura* 'paint'
cigarru 'cigarette'	*perfumi* 'perfume'
gasi 'petrol'	*computadorhu* 'computer'

Similarly to the cases from the 1950s presented in Figure 10, only three of the terms listed in (5) remain phonologically identical to their Spanish original: *galleta* 'biscuit', *café* 'coffee' and *pintura* 'paint'. The terms *chicli* 'chewing gum', *pinoli* 'pine floor cleaner' *aceiti* 'oil' and *perfumi* 'perfume' all display word-final raising of Spanish /e/ to /i/. Similarly *cigarru* 'cigarette' displays raising of final /o/ to /u/ from the Spanish, while the word-final appearance of /u/ in *computadorhu* 'computer' is hard to explain given the Spanish original *computadora*, with final /a/. It may be that speakers (or this speaker in particular) has reanalysed 'computer' as having male gender, which it does in European Spanish albeit with a different lexical item, namely *el ordenador* 'the.MASC computer'. Canonical masculine nouns and adjectives in Spanish terminate in *-o*, which would then be raised to *-u* in Purepecha. Nevertheless, the high vowels /i/ and /u/ are particularly common in word-final position in Purepecha thanks to the CV syllable structure that predominates in the language, and the requirement for word final syllables to be open (see Section 1.5.1). Finally, it is worth noting the 'Purepechisation' of the Spanish *gaz* to *gasi*, where the addition of the word-final vowel allows the word to adhere to internal rules of syllabification (see Capistrán Garza Bert, 2005).

While the formal status of adjectives in Purepecha remains somewhat

contested (see Section 1.5.2 for a discussion), it is clear that numerous loan adjectives from Spanish now occupy the semantic domain of colour in Purepecha, see (6).

(6) *anaranjadu*[98] 'orange'
rosita, rosa 'pink'
marrón 'brown'
moradu 'purple'

Purepecha traditionally has a six-term colour system, comprising basic (i.e. non-derived) terms for black, white, red, blue, green and yellow that are all constructed according to the same morphological template: ROOT + *-pi* + *-ti*, e.g. *charapiti* 'red'(see Section 1.5.2; see also Chapter 4 on smell predicates for an analogous case in a different perceptual domain). Historically Purepecha did not possess basic terms for colours that tend to emerge later in the development of colour systems, namely orange, brown, pink, grey and purple (see, e.g., Kay et al., 1997). In the extensive two-volume Purepecha-Spanish and Spanish-Purepecha *diccionario grande* 'big dictionary', assumed to date to around 1591 (Anonymous, 1991), there are no entries for grey, pink or brown. The two entries containing the term 'orange' refer to *tsipan(i)* 'toasted flowering corn', where the colour of the object provides the colour term. *Tsipani* has since been replaced with the Spanish *anaranjadu* 'orange', which is itself derived from the term for the fruit *naranja* 'orange'. For purple, none of the four entries in the *diccionario grande* includes a basic colour term but rather draft in terms that invoke the concept of purple, as in *ts'irantsi ats'iri*[99] 'purple corn'. The first element in this compound, *ts'irantsi,* is related to terms referring to 'cold' (more accurately rendered as REFERRING TO COLD, see Chapter 6) although this specific form is not attested in modern descriptions of language, which give the non-vowel initial form *tsiri* 'corn'. A second term of interest related to purple is *shari shari-k'a-k'u-ni*[100] 'to bruise it, to make it purple', where *shari(-)* functions as both the noun

[98] Note again the phonological adaptation of word-final *-o* in the Spanish terms *anaranjado* 'orange' and *morado* 'purple' to *-u* in Purepecha.
[99] The original orthography in the *diccionario grande* is *thziranczi ahtsziri*. I have standardised it here for greater ease of comprehension.
[100] The original entry appears as *Xari xarihcahcuni*.

'lavender' as well as the root RELATING TO LAVENDER, once again providing the colour semantics through extension from, here, a plant of the appropriate colour. The Spanish term *rosa* 'rose, pink', often found in the diminutive form *rosita,* represents an analogous development where an object of a particularly colour comes to stand for the colour itself.

That said, we cannot claim to be dealing simply with a case of lexical gap filling, namely that Spanish words are drafted in to fill lacunae in the Purepecha lexicon. This is clear since the Purepecha term *echeri* 'earth' can also be used via semantic extension for brown (cf. Spanish *marrón*), *t'upurini* 'ashes' for grey (cf. Spanish *gris*), and *warhuti* 'purple maize' also exists for purple (cf. Spanish *púrpura* and *morado*). All three of these terms retain their nominal morphology in the form of ROOT + classificatory suffix *-ri* or *-ti* (see Chapter 5) + optional objective case suffix *-ni*, even when used adjectivally, and so cannot be considered basic in the sense of the six colours cited above. Nonetheless, we can observe that the colour term system of Purepecha has been extended through the use of Spanish lexemes, notably the terms for orange, grey and pink.

Moreover in the domain of colour, it is possible to combine the two languages in noun phrases containing an adjective and a noun. Both permutations are possible, namely the Spanish colour term can be modified by a Purepecha adjective (7a) and a Purepecha colour term can be modified by a Spanish adjective (7b). For clarity, Spanish terms are underlined.

(7a) <u>rosa</u> niatsïti
pink dark
'dark pink'

(7b) charhapiti <u>baj-itu</u>
red dark-DIM
'dark red'

It is worth noting that the congruence in constituent order in the noun phrase (i.e. both

languages are predominantly N-Adj) enables a noun from one language and an adjective from the other to be combined without difficulty.

Until now, we have focussed purely on the undeniably extensive Spanish lexical influence on Purepecha. I noted in Section 4.3.3 that some of the Spanish entries in the Cuitlatec wordlist (Hendrichs, 1946) were Purepecha in origin, indicating that in the Spanish of that region at least, the contact situation was such that Purepecha words have been borrowed into the local variety of the national language. Meneses (2016) has identified a considerable number of Purepecha loans in the contemporary monolingual Spanish of the same area, namely the central part of the River Balsas basin, including the south-east part of the *tierra caliente*, the hot lowlands of southern Michoacán and northwest Guerrero. These loanwords belong to the varied domains of flora (8a), fauna (8b), objects/artefacts (8c), foodstuffs (8d), people (e), and others (8f). The selected examples are all translated, and in some cases amended, from Meneses (2016: 253-258).

(8a) *cipiate* 'tree with a disagreeable odour' < *sïpi-* 'to stink' (see Chapter 4 for a more detailed discussion of this and other 'stink' roots)
cueramo 'tropical tree with caustic properties' < *k'ueramu* 'idem.'
tepamo 'tree used for religious and medicinal purposes' < *tepamu* 'idem.'

(8b) *arapara* 'large stinging wasp, very dangerous' < *arhapara* 'with a divided back'
cures 'type of large ant, with a painful bite' < *kurhi-* 'to burn'
paracata 'butterfly'

(8c) *parangua* 'three-stone base for preparing a fireplace < *parhankua* 'idem.'
sicua/tsicua 'fibre, made from a tree bark used for tying' < *sï-* 'hard, flexible'[101]
tarecua 'type of hoe' < *tarekua* 'digging instrument' < *tarhe-* 'to work the land' (see Chapter 3 for a more detailed discussion of metalworking vocabulary)

(8d) *manacata* 'mixture of sweetened squash and milk' < *manakata* 'the moved one' (possibly in reference to stirring)
toqueres/toqueras 'corn tortilla or gordita[102] made with ripening corn' < *t'okeri* 'ripening corn; something that is soaked, still damp'

(8e) *guacha/guache*[103] 'child' < *watsi* 'child'

(8f) *cuinda* 'bad-smelling water; boggy mud; mud that pigs bathe in' < *kwintiri* 'thick liquid, viscous, sticky substance' (possible)[104]
ómitas 'small islands that form in rivers' < *omini* 'to be a flooded place', cf. also *omikwa* 'island'
tupo 'umbilical cord' < *t'upu* 'idem.'

While (8a-f) are all nouns of a largely culturally-specific nature (with the exception of (8e and some of (8f)), the presence of borrowed adjectives (9a) that have been adapted to Spanish morphology (e.g. the *-oso* termination), verbs and verbal phrases (9b), as well as expressions (9b) in the Spanish of the *tierra caliente* speaks to a

[101] See also *sïkua* 'toasted maguey, mezcal' and *sïntari* 'rope, string' from the same root.
[102] A *gordita* is a smaller, thicker version of a tortilla, made in the same way but not flattened out as much, hence its name 'the little fat one'.
[103] Note the typical Nahuatl orthography, of /gu/ for /w/. This may reflect longer-term Nahuatl influence in the region.
[104] I propose an alternative etymology, namely from *kue-* 'mucus', with related forms *kuechenta* 'saliva', *kueneiri* 'phlegm from throat or chest'. All of these terms suggest a thick, viscous substance, akin to thick, sticky mud.

scenario of more prolonged contact between the two languages. These examples of these structurally more complex borrowings are once again translations of the examples in Meneses (2016).

(9a) *charaposo/cheraposo* 'coarse, rough surface' < *cherapini* 'to be rough'
chumbo 'crooked' < *chumbi-* 'crooked, hunched (physical defect)'
sopomo/a 'short and fat' < *tsopotsopokarani* 'to be fat, of the body'

(9b) *cargar a cumbuche* 'carry on the back, generally of children' < *k'umbu-* 'bulky, swollen' (probable)
ari 'exclamation of admiration, surprise, incredulity; similar to Sp. *ándale* < *arhi* 'say (it)! (imperative)' or *ari* 'this'

Indeed this influence suggests an impact of the indigenous language on the imposed colonial tongue that has not been recorded elsewhere in the Purepecha region (see also the discussion in Section 4.4.). I will return to the Spanish impact on Purepecha in the next section, turning my attention to influence in the morphosyntax.

4.4.2. Contact in the morphosyntax

In the previous section, we observed how Spanish loanwords are abundant in modern-day Purepecha, but that in the Spanish of the *tierra caliente*, the direction of borrowing has been reversed and the national language there sees considerable influence from the indigenous language. However in both cases, the locus of investigation was restricted to lexical items. The introduction of lexical items from one language to another requires relatively little effort and generally does not require either set of speakers to be bilingual. In the case of borrowing and integration of morphological material from one language into another, however, a great deal more interaction must take place and bilingualism must therefore be more balanced. In this section I will present a number of examples of how different parts of speech from Spanish are integrated into Purepecha morphosyntax.

Let us begin with the nominal domain. In the following examples we can

observe full Spanish lexemes (here, nouns) taking on Purepecha nominal morphology in the form of the objective case suffix on 'lemon tea' (10a), the genitive case suffix on 'petrol pump' (10b) and a combination of both the plural and genitive suffixes on 'book' (10c). Spanish loanwords continue to be underlined in the examples for clarity.

(10a) isïku este te de limoni-ni
DEM DEM tea of lemon-OBJ
ja-k'u-nti-xin-ti
smell-SP.LOC-SP.LOC-HAB-3.S.ASS
'This, this smells of lemon tea.'

(10b) bompa gasolin-eri
pump petrol-GEN
'petrol pump' (lit. pump of petrol)

(10c) siempri isï eska ima libre-tech-eri
always like.that DEM 3SG book-PL-GEN
'Still like that, of books.'

Spanish adjectives are also inserted into otherwise Purepecha speech, including with original additional derivational morphology, as demonstrated by the diminutive form of *suave* 'soft' in (11a). In (11b) the Spanish adjective takes the objective case, as also observed for the noun in (10a).

(11a) i isïku sesi anku-t'i sesi suave-situ
and DEM well HES-3S.ASS well soft-DIM
ja-rha-ni no xani fuerti
smell-SP.LOC.NF NEG very strong
'And this one is well, um, it smells well soft, not very strong.'

(11b) dulcisi-ni ja-k'u-nti-ni
sweet-OBJ smell-SP.LOC.manual-SP.LOC.interior.surface-NF
'[It] smells sweet.'

Examples (10a), (10c) and (11a) also highlight another common form of borrowing from Spanish into Purepecha, namely that of function words and discourse markers (Bellamy, 2016; Chamoreau, 2007). It is claimed that these parts of speech are particularly easy to borrow as they often stand apart from the clause, they may have their own stress patterns and are also characteristic of the donor language and they may also have particular, positive, associations for the speaker (Bakker & Hekking, 2012). This combination of structural ease of integration coupled with positive attitudes enables the speaker to insert such terms at will in discourse. Examples (12a-b) further illustrate function word borrowing in Purepecha.

(12a) esīka sīrata ampe peru no sani winhamintu
like smoke what however NEG very strong
'Like smoke right, but not very strong.'

(12b) buenu ima chocolati-ni ja=tsi-tsï-ku-k'a
well DEM chocolate-OBJ have=SF-SP.LOC-3APPL-EXCL
'It has chocolate (to me)!' (i.e. it is chocolatey)

In the verbal domain, Spanish infinitives can be integrated fully into Purepecha structure, through the addition of inflectional suffixes, in the form of aspect (13a) and aspect and person marking (13b). The integration of Spanish verbs into Purepecha morphology occurred particularly frequently in responses to sound stimuli in the language of perception kit. This may be due to the connection of Spanish, the language of technology and communication, with an activity such as listening to or using a mobile telephone, especially as many of these sounds had a digital quality to them, typical of the sound produced when pressing buttons on an older style handset.

(13a) esïka enka=ksï apenas-i pasar-i-ka
like those.which just-EPEN pass-EPEN-SBJV
'Like those [cars] that have just passed [by].'

(13b) Inte primeru isï kurha-kwarhi-ti esïka
DEM first like.this listen-REFL-3.S.ASS like
telefonu nema marcar-i-ni ja=rha-ni
telephone someone call-EPEN-NF to.be-NF
ka segundu isï kuska-xïn-ti incha
and second like sound-HAB-3S.ASS entering
llamada ampe ka no contestar-i-ni=sï
call what and NEG answer-EPEN-NF=3PL.S
'This first [one] sounds like someone is calling [on] a telephone. And the second [sound] sounds like an incoming call and they aren't answering.'

Note that all of the Spanish verbs are inserted in their infinitival form, e.g. *pasar* 'to pass', followed by what I have glossed here as an epenthetic high vowel /i/ and then finally the inflectional morphology relating to aspect and/or mood and person is added. Chamoreau and Villavicencio analyse these borrowings as monomorphemic morphological units that can take inflectional morphology directly, as in the case of *marcar-i-ni* 'to call' in (13b), see Capistrán Garza Bert (2005: 93). However, Capistrán Garza Bert (2005) argues for a bimorphemic analusis, whereby the /i/ present following the Spanish root is the result of the reduction of a long vowel formed from an epenthetic *-i* and the predicativisor (or verbalisor in her terminology) *-i*. This reduced vocalic form has been reanalysed as comprising a root plus formative *-ri* (not found as a formative with native roots), to which TAM morphology can then be added. The extent to which this reanalysis is present in speakers' grammatical representations is a question for future, empirial research.

There is also evidence of the use of participial morphology from Purepecha suffixed to, in (14), the Spanish noun *espiral* 'spiral' in relation to the texture of a material. Note also the presence of a fully derived Spanish past participle in the form

of *reducidu* 'reduced', indicating that speakers have access to analogous constructions in the grammars of the two languages. This, in turn, is facilitated by similarities in constituent order in such constructions. It may also be the case that constituent order convergence is taking place, whereby Purepecha structures are being remodelled on the Spanish template due to prolonged contact (e.g. Chamoreau, in press).

(14)	Espirarhi-rini	jasï	peru	menosi	sani	sani	[…]
	spiral-PTCP	good	but	less	little	little	
	reducidu						
	reduced						

'It [is] well spiralled, but less, somewhat reduced (i.e. less so).'

In comparison with the prehispanic language contact situation in Michoacán, bearing in mind the obvious restrictions imposed by a relative paucity of data for the earlier phases, modern-day Purepecha is heavily influenced by Spanish in all domains and all parts of speech. Purepecha-Spanish bilinguals are able to make use of the grammar and lexicon from each of their languages in their speech, and use them in varying proportions depending on the topic of discourse (note especially the Spanish-heavy discussion of sounds like telephones). Such a state of affairs can be associated with longer-term, more intense contact of Thomason's (2001) type 3 variety.

However we should always bear in mind that one language may be preferred over the other in some situations and vice versa. Indeed such a diglossic situation can be observed in many Purepecha communities, where Purepecha may be the language of the home (especially among female family members who tend to spend more time in the home), in local shops and with friends, while Spanish is the language of instruction in both primary and secondary schools, as well as at the local 'intercultural' university, whose programmes are - somewhat paradoxically - aimed at local indigenous students whose first language is often Purepecha. Spanish is most frequently the language of the workplace, and for interaction with individuals from non-Purepecha speaking or dominant communities.

4.5. Bringing the perspectives together

Thus far, this chapter has presented two very different faces of language contact between Purepecha and neighbouring or co-extensive languages at varying spatial and temporal levels. Long distance, or diffusional, contact has yielded very little in the way of observable lexical influence (see Section 4.3.1 as well as Chapter 3). The similar naming conventions for certain terms, such as metals and metal objects, that can be observed in both the Andean region and West Mexico may well stem from a shared human experience rather than any kind of prolonged and meaningful interaction of artisans or other groups or individuals. At the mid-distance, or areal, level the lack of loanwords and shared semantic calques found in an extensive set of wordlists supports previous claims largely regarding morphosyntax that Purepecha is peripheral to or even outside of the Mesoamerican linguistic area (see Section 4.3.2, see also Chamoreau, in press). Even at the short-distance, or regional, level there is very little evidence of external lexical influence on Purepecha, save for a number of borrowings from Nahuatl that have entered the language either through Spanish, or as pan-Mesoamericanisms whose route into various languages (including Purepecha) across the region is less clear, but also originates in Nahuatl (Section 4.3.3).

The lack of observable loans from neighbouring languages in Purepecha has clear implications for our interpretation of the socio-political situation in Michoacán in the prehispanic and early colonial periods, as well as our understanding of the associated linguistic interactions.[105] In terms of the intensity of contact, the limited nature of the findings presented in this chapter certainly suggests that interaction between Purepecha and neighbouring languages was sporadic and not particularly intense, namely Thomason's (2001) first type of contact situation. This type of situation would generally preclude any form of societal bilingualism, in contrast to the claims of Meneses (2016) and Gorenstein & Pollard (1983), who state that Purepecha essentially functioned as a regional *lingua franca*. Alternatively, and this is much harder - if not impossible - to test, it may have been the case that some

[105] The lack of observable borrowing stands in stark contrast to the situation found in many other Mesoamerican languages, such as Mayan, Mixe-Zoque and Zapotec, indicating that Purepecha may be alien to the region. Its peripheral membership of the Mesoamerican linguistic area further strengthens this position. Howeve, I will not speculate further on the origins of the Purepecha people.

Purepecha speakers were bilingual but that they were particularly resistant to influence from other, surrounding languages. An analogous case of resistance can be found in the code-switching literature, where it has been documented that certain communities, such as the Turkish-speaking Muslim community in Thrace (Greece), shun the practice of code-switching, despite being multilingual (Gardner-Chloros, 2009: 104). A complex combination of social and structural features likely contributes to such resistance, but among the most important we could cite the privileged social position held by the prehispanic Tarascans as leaders of the powerful, socially stratified, hierarchically-structured Tarascan State. As an elite group, the prehispanic Purepecha speakers may have either rejected external influence on language purism grounds, or simply not enough speakers of other languages interacted with them in order to learn Purepecha as a second (or third) language (see also Trudgill, 2011 on isolationism).

In contrast, modern-day language contact with Spanish, a situation which began in the early sixteenth century, has resulted in almost complete bilingualism amongst Purepecha speakers. The outcomes of such prolonged and intense contact are lexical borrowings from Spanish far beyond simply cultural terms or gap filling, as well as morphosyntactic changes such as the integration of Spanish nouns and verbs (in infinitival form), the introduction of an analytic comparative phrase along the Spanish model, and a shift in word order (e.g. Chamoreau, 2007, although she also admits (Chamoreau, in press) that we still lack a full picture of constituent order in all varieties of Purepecha). The structural nature of these changes (reflecting Thomason's type three contact situation) is indicative of a general language shift to Spanish on the part of many Purepecha speakers, fuelled by, *inter alia*, a predominantly monolingual Spanish education system (see Section 1.6), more advanced telecommunications (available almost exclusively in Spanish), and more frequent economic migrations within Mexico and to the USA that place more importance on competence in Spanish rather than Purepecha. This situation points to a clear example of temporal contrast in processes of language change, namely in the pre-Columbian vs post-Columbian periods. Moreover, it is possible to observe a shift too in the relative importance and prestige of the two languages from the contact effects: a once prestigious imperial

language is now under threat from a (not so) new official national language. As such, language (here, Purepecha) does not only act as a mirror for socio-political change, but it also helps to shape the context of its use (Bellamy, 2016; see also Gardner-Chloros, 2009).

5. OLFACTORY LANGUAGE IN PUREPECHA[106]

"You should try reading your shirt, it's probably a novel by Victor Hugo."
(Rimmer to Lister, 'Waiting for God')

Abstract

Smell has traditionally been considered a difficult, or even impossible, sense to express linguistically. Yet various languages possess distinct morpho-syntactic means for describing smells in an abstract way, not simply in relation to the source of an odour, as is common in western languages. Purepecha can be considered one of these 'olfactory cultures', which are found in the Americas, Africa and Southeast Asia. In this chapter I present a three-way typology of olfactory language in Purepecha, comprising: (i) basic terms, composed of one of 14 perception roots and the smell-specific 'spatial couplet' morphology *-k'u* and *-nti;* (ii) descriptive terms whose root conveys another state or event (e.g. to burn) plus the spatial couplet morphology; and (iii) the source of the odour (a noun) plus the generic verb 'to smell' *ja-*. I discuss how different elicitation methods obtained varying proportions of these three types of smell predicates, as well as the distribution of the three generic roots referring to the concept of smelling following Viberg's (1984) typology. This presentation of synchronic language use in the olfactory domain is expanded with the historical perspective. Here I consider the references to smell in the two extant written works available to us for 16th century Purepecha. The same three-way typology of smell terms can be identified in these works, suggesting that the Purepecha 'smell canon' appears relatively stable, albeit with some changes to the spatial couplet morphology. This chapter therefore provides new insight into a previously unstudied topic, as well as indications for future research into issues of word formation and language change.

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5.1. Introduction

> Arnold Rimmer, the only hologram aboard the Jupiter Mining Corporation spaceship Red Dwarf, enters his sleeping quarters to find his bunkmate Dave Lister running his nose along the pages of a battered hardback book, sniffing enthusiastically as he goes. Rimmer stops in the doorway and asks, incredulously, "What are you doing?". "I'm reading," comes the reply from Lister. "What, with your nose?" the questioning continues. "Yeah, it's a cat book," Lister explains, "they don't use marks, they use smells. You run your nose along the line and all the different smells are released. It's really good." Rimmer reacts in typical negative fashion: "What a pathetic idea," (Grant & Naylor, 1988).

While the idea of a human language composed entirely of smells may seem more preposterous than pathetic, it is nonetheless true that the study of olfaction has lagged behind the study of other senses, especially sight and touch (McHugh, 2012: 9). Where olfaction has been studied, it has often been subject to negative aesthetic judgements, such as being placed at the bottom of the sense hierarchy (Corbin, 1982). Classified by Kant (2006) as a secondary, subjective sense (see also Enríquez Andrade, 2010: 140), smell has traditionally been considered difficult, or even impossible, to express in words (see references in Majid & Burenhult, 2014; Wnuk & Majid, 2014). Of the five senses, olfaction is widely considered to be confined to the periphery of our sensory expression. In many Western languages, terms for smells are drawn from the source of the smell itself, or a similar smell, such as 'smoky' (i.e. 'of' or 'from smoke') or as an ostensive statement such as 'like bacon' or 'bacon-y' in English. Alternatively, smell terms may constitute hedonic statements that can be applied to all kinds of sources, for example 'disgusting' or 'delicious'. As these hedonistic adjectives indicate, in many languages terms for smells may be shared across the senses, enabling something (or someone) to look, feel, taste, smell or sound 'lovely' (see Section 5.3.2).

Yet olfaction is unique amongst the senses when it comes to both perception and reception. Odours can be carried and perceived from afar, as well as from near,

making smell both a remote and a contact sense (McHugh, 2012: 25). In contrast, objects cannot be touched or tasted at a distance and, while sounds can be heard from afar, they do not interact physically with the human body as the particles contained within odours do. This uncontainable, or transgressive, property, of smell alone was considered both fantastic and dangerous in early Christian writings, for example: When writers from this period wished to evoke a divine presence in concrete terms, they did so with olfactory imagery, whereby invisible odours could cross the boundary of heaven and earth (Harvey, 2006: 53). Conversely Tertullian, an early Christian theologian from Carthage, considered the uncontainable fumes and fragrances from pagan rites to be dangerous to Christians since one cannot block out olfactory stimuli as one can visual or auditory stimuli, for to do so is to stop breathing (Harvey, 2006; 38). Yet as we will see in the next section, many languages have developed distinct mechanisms for expressing this "elusively ambiguous" and potent sense.

5.1.1. A survey of "smell languages"

Unlike English or French, for example, not all languages suffer from a "baffling poverty" (Corbin 1982: iv) when it comes to talking about odours.[107] In the past 70 years, various anthropological and linguistic studies have brought to the fore a number of so-called "olfactory cultures" (Almagor, 1987: 107), which will be reviewed in this section. It should be noted that I will focus on languages possessing distinct olfactory terminology rather than those in which smell plays an important cultural role, such as the Kwoma of New Guinea, who consider smell to be a more enduring sense than sight, but do not encode it in a specific way linguistically (Howes, 2003).

In Africa, several Western Nilotic languages possess dedicated terms for expressing smells (Storch, 2014 and references therein). In Nuwo of centre-west Sudan, for example, smell words constitute a separate word class on morphosyntactic grounds. These words are not semantically related to any other nouns, verbs or adjectives in the language, and possess a multiplicity of meanings not found in any

[107] For a contrary position, see McHugh (2012: 65), who claims that in English people do not have difficulties talking about smell. He argues that English speakers' frequent recourse to ostensive descriptions, such as 'lotus-like', is also mirrored when talking about colour (i.e. vision), as in terms such as 'custardy-yellow'. What English, and languages like it really lack, then, is olfaction-specific vocabulary that does not rely on sources, comparisons or terms from other senses (see Section 5.3.1).

other set of quality words, such as those expressing sounds or textures (Storch, 2014: 51). For Kuteb (also Kutep, Jukanoid, east-central Nigeria) Koops (2009: 62) lists thirteen "unusual" olfactory terms, all of which refer to unpleasant smells, mostly described in terms of comestibles, e.g. *nuŋ ashwáe* 'to smell of fermented cassava, guinea corn sprouts'. In the same language family branch, Blench and Longtau (1995) present the main odour terms of Tarok (east-central Nigeria), highlighting their unique grammatical properties with respect to other word classes, including ideophones, another frequently under-described word class cross-linguistically. Hombert (1992) offers a comparative table of basic smell terms in five Bantu languages of Gabon: Wanzi, Nzebi, Sangu, Tsogo and Fang. He also notes that some of the smell terms seem to correspond to the primary odours (linked to human secretions and specific anosmias) identified by Amoore and colleagues, namely urine, sweat, sperm, musk, fish, malt, camphor and mint (Hombert 1992: 62-3).

In Kambaata, a Highland East Cushitic language of Ethiopia, there are two basic evaluative smell verbs: *anj-* 'to smell good (intr.)' and *bob-* 'to smell bad (intr.)'. This pair is supplemented with a more specialised, but equally basic, term, namely *toonn-* 'to smell burnt (intr.)' (Treis, 2010: 326). The Kapsiki language of north-east Nigeria and north Cameroon (where it is known as Higi) contains many ideophones, including 14 smell ideophones. But perhaps more important than their presence in the language is the differential interpretation of these terms by blacksmiths and non-smiths, an interpretation that relates to the perceived edibility of the referents. Each group defines edibility in their own way but, in short, the non-smiths consider the smiths to smell bad as a result of their diet as well as their social roles and functions, which include forging iron and burying the dead (Van Beek (2010, 1992). Another example of one group defining itself in relation to a perceived malodorous 'other' can be found in Almagor's (1990, 1987) studies of the Dassanetch (also Daasanach, East Cushitic, south-west Ethiopia). The pastoralist Dassanetch groups distinguish themselves from neighbouring pastoralist or agricultural groups, as well as some of their own fisherman groups by each one's respective smells, which reflect the

predominant mode of subsistence.[108] While "[t]he smell of everything connected with cattle is good, […] the smell of those engaged in fishing is considered bad, to the point of revulsion" (Almagor, 1987: 109). This repugnance stems from the notion that fish are antithetical to cattle, and cattle are central to the culture and livelihood of the Dassanetch pastoralists. The Cangin-speaking Sereer Ndut (North Atlantic, west Senegal) also identify certain groups as smelling of particular odours, such as white people as smelling of urine (Dupire, 1987: 8). The odour of the soul is at the centre of their socio-religious and medical representations; the only attribute babies share (until weaning) with the ancestor-protectors they reincarnate as is the odour of the immortal soul. Odour terms in Ndut take a binary classification according to animacy whereby human (*kiili)* odours contrast with non-human or animal (*nget)* odours. Perceptible odours in these two categories can be further classified into five domains: urine, rotten, milk and fish, all acidic and disagreeable odours, and all agreeable odours (Dupire, 1987: 12).

In Mexico two 'smell languages' have also been identified, namely Papantla Totonac and Seri.[109] In Papantla Totonac (Totonacan, Veracruz), Aschmann (1946) identifies eight separate stems pertaining to the many distinctions of smells that the language must express in the absence of a generic verb meaning 'to smell' (cf. Levy, 1992 for a list of ten physical property adjectives relating to smell). Each stem possesses a core smell meaning, e.g. *ha-* 'medicinal and aromatic smells', which may be hard to define adequately given the range of referents covered.[110] However, these stems may also be used to express meanings related to taste and desirability (Aschmann, 1946: 187), thus they perhaps should not be considered basic smell terms (see Section 5.3.1). On the contrary, Seri (isolate, Sonora) possesses seven monomorphemic and two multimorphemic smell verb roots. These terms are abstract

[108] Note also the parallel in early Christian writings, notably those of the Greek grammarian Athenaeus, who observed that "gender, social class and moral disposition were all marked by distinct smells," (Harvey, 2006: 30-31).

[109] On the basis of terms collected from dictionaries, Enríquez Andrade (2010) identifies nine other languages in Mexico that have specific terms to refer to odours, namely Chinantec, Ch'ol, Chontal de Tabasco, Huastec, San Mateo del Mar Huave, Maya, Mazatec, Tlapanec and Zapoete. However, he provides no morpho-syntactic analysis of the forms, nor any comparison with the elements in the lexicon to which the smell terms refer. As such, I will not consider these languages smell languages per se, but leave the way open for a more detailed analysis of the terms presented in future studies.

[110] We will see a parallel with the generic smell verb *ja-* 'to be' in Purepecha, in Section 5.3.1.

in that they "appear to distinguish different qualities of smells, [… but] do not lexicalise the source of the odor and are not used with one particular referent" (O'Meara & Majid, 2016: 115). The case of Seri also highlights how smellscapes can change over time; olfactory language in Seri is under threat as a result of cultural transformations imposed by increasing globalisation (see also Section 5.5).

Additionally, in South America we find more examples of 'smell cultures' who use odour as a means of social classification. The Desana (Tucanoan) of the Colombian Amazon categorise each tribal group, including themselves, in terms of their own characteristic odour, which is in part inherited and in part influenced by the type of food they consume. Each group's territory is therefore permeated by a *máhsa serirí* 'tribal odour, tribal feeling, sympathy'; similarly they characterise areas of the jungle in terms of the odours emitted by the animals that live there. These areas can be cross-cut by 'wind threads' of plants and fruits, which lead to their source (Classen, Howes & Synnott, 1994: 98-99). Two indigenous groups of the Mato Grosso region of Brazil, the Suya (Jê) and the Bororo (Bororoan), also exhibit a complex system of olfactory classification. The Suya place humans, animals and plants into one of three classes - bland-smelling, pungent-smelling and strong-smelling - on the basis of their relative danger to human society: "the stronger-smelling the class, the more potentially dangerous its members" (Classen, Howes & Synnott, 1994: 101). The Bororo assign virtually everything in the world to one of eight odour classes, which range from *jerimaga,* a musky, rotten smell at one end, to *rukore*, a sweet smell at the other. These two opposing odours also represent life's two basic forces, life and spirit, a binary division that provides the foundation for Bororo beliefs and practices (Classen, Howes & Synnott, 1994: 101-102).

The most systematic research into olfactory language to date has been conducted by Asifa Majid and collaborators, whose in-depth cross-cultural studies of a number of Aslian (Austroasiatic) languages of south-east Asia has considerably expanded our understanding of the limits of the smell lexicon, as well as its role in cultural beliefs and practices. Take for instance the Jahai, a small group of rainforest foragers living on the Malay Peninsula, who possess around a dozen abstract, but everyday, terms for describing odours (Burenhult & Majid, 2011; see also Majid &

Burenhult, 2014). These terms can be categorised in terms of their pleasantness, with unpleasant connotations accounting for the majority (two-thirds) of terms. A similar preference for unpleasant terms has been found for Formosan languages (Lee, 2015, 2010), while certain similarities with referents of 'stink' terms in Seri (Sonora, Mexico) are also suggestive of this overall preference (O'Meara & Majid, 2016; see also Enríquez Andrade, 2010). Maniq, an Aslian language spoken in southern Thailand is also rich in abstract smell terms, possessing around 15 phenomenon-oriented descriptions (Wnuk & Majid, 2014). These terms can be characterised along two principal dimensions: pleasantness as with the Formosan languages, but also in terms of dangerousness, reflecting the primary and secondary axes of odour perception (Wnuk & Majid, 2014: 133 and references therein; see also McHugh (2012) for an extensive discussion of the fundamentally binary aesthetics of olfaction in Medieval Southeast Asia). Adding further support to the claim that smell terms can be reconstructed for the shared proto-language of this family, Semai (Malay Peninsular) has around 25 distinct smell terms, 15 of which adhere to a sensory template structure, which provides information on a type of perceptual notion not limited to olfaction (Tufvesson, 2011: 88).

Purepecha also appears to be one of these olfactory languages. Friedrich (1984, 1971a) was the first scholar of the language to note that it possesses an unusually large number of terms translated as 'to stink', and that these terms display a particular, and uncommon, morphosyntactic pattern. However, until now, this observation has slipped under the radar of olfactory language researchers. In this chapter I aim to fill this gap by offering the first classification of odour terms in Purepecha. To do so, I draw on data from Friedrich's published and unpublished materials (idem.; Friedrich, unpublished), a late sixteenth century Purepecha-Spanish dictionary (Anonymous, 1991) and my own fieldwork data from 2014 to 2016, gathered using the language of perception elicitation kit (Majid, 2007), interviews, freelisting, a written translation exercise, and reactions to real sources or 'smell jars'.

The rest of this paper is structured as follows: In Section 5.2 I introduce Purepecha, including a brief history of scholarship on the language as well as some key aspects of its morphosyntax. This acts as context for Section 5.3, where I present

a three-way typology of odour terms, that is morphosyntactic ways of describing smells, supplemented by a description of taste predicates as a means of introducing the notion of under-specification of roots, an interpretation that is pursued in more depth in Chapter 6. In Section 5.4 I offer an historical perspective of olfactory terms by discussing the forms present in the two main early historical sources of the language: the Diccionario Grande, an extensive Purepecha-Spanish dictionary, and the Relación de Michoacán, the earliest written record of the prehistory of one Purepecha social group. The historical discussion demonstrates the temporal stability of basic odour terms in Purepecha, and simultaneously introduces the role of odours or fragrances in prehispanic religious practices. Section 5.5 presents the conclusions and avenues for future research.

5.2. Introduction to Purepecha

Purepecha is spoken by around 125,000 people (INEGI, 2010) in the highlands of Michoacán, centre-west Mexico (see Chapter 1, Map 1). Speakers are currently located in four non-contiguous regions, which also constitute the four main dialect groupings. Dialectal differences can be observed in the phonology and lexicon (Chamoreau, 2005; Friedrich, 1971b), although the extent of syntactic variation remains unclear due to a continued lack of research (Chamoreau, in press). Estimates state that around 15,000 Purepecha speakers are living in the USA (Lewis et al., 2016), although that figure may be somewhat higher. The language is widely regarded as an isolate (e.g. Campbell, 1997), and a peripheral member at best of the Mesoamerican linguistic area (Chamoreau, 2017; Campbell, Kaufman & Smith-Stark, 1986). The majority of Purepecha speakers are bilingual with Spanish, the national, dominant language of Mexico, with only around a quarter of children learning the language in the home (Chamoreau, 2000: 14). As such, the language is under considerable pressure from Spanish, the results of which can be observed not only in general language shift but also in innovative grammatical constructions in Purepecha, such as the introduction of new comparative phrases based on the Spanish model (see Chamoreau, 2012, 2007).

The modern language is relatively well described; references include two descriptive grammars (Chamoreau, 2000; Foster, 1969), a learner's grammar (Chamoreau, 2003 for the French version) and a multiplicity of books and articles on more specific aspects of the language (e.g. Capistrán Garza, 2015 on multiple object constructions; Monzón, 2004 on spatial location morphemes; Friedrich, 1971a also on spatial morphemes). A Purepecha-Spanish dictionary (Velasquez Gallardo, 1978) and a sketch dictionary (Lathrop, 2007 [1973]) also exist, although neither work offers analysis at the morpheme level. Researchers also benefit from a considerable number of historical sources, notably a very early colonial grammar and dictionary (Gilberti, 1987 [1558], 1975 [1559]), and an impressive two volume Spanish-Purepecha, Purepecha-Spanish dictionary, estimated as originating from the late sixteenth century (Anonymous, 1991). This latter source in particular enables a comparative historical perspective to also be taken in this chapter.

Purepecha is a wholly suffixing, agglutinating language, with nominative-accusative alignment, seven nominal cases and a preference for dependent marking (cf. Chamoreau, 2017). The language is characterised by its rich verbal morphology and a large set of between 30 and 50 spatial location morphemes, depending on the variety. The verb, or what Friedrich (1984) rather underwhelmingly refers to as the 'long word', in its maximum expression has 12 slots following the verb stem (see Figure 11; see also Section 2.5.1). It is not possible to fill all slots simultaneously, and rarely do words contain more than four or five suffixes, with a functional maximum of seven (Friedrich, 1984: 65). Moreover, suffixes occurring in the same slot cannot co-occur, with two exceptions to be discussed in Section 5.2.1.

√	**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

Figure 11: Maximum verb template in Purepecha

5.2.1. Spatial location suffixes[111]

The spatial location suffixes play a pivotal role in the formation of both nouns and verbs in Purepecha, and constitute a vital component of the basic smell terms (see Section 5.3.1; see also Section 1.5.2). Spatial location morphemes are of two types: (i) those expressing extracorporeal reference only (1a), and, more frequently, (ii) those with both corporeal and extracorporeal reference (1b-c). Foster (1969: 93) notes that "[b]ody suffixes may be applied to non-body areas but not vice versa." Indeed this latter sub-set can have abstract as well as concrete reference, in some cases also demonstrating considerable metaphorical and semantic extensions (Chamoreau, 2017). The suffix *-narhi* 'flattish area' in examples (1b-c), for example, can also refer to feelings of fear and the sun (idem.). Note also that there is no formal or functional relationship between the spatial location suffix and the nouns for the locations or areas they represent, such as *-nu* 'on the patio' vs. *ekwarhu* 'patio' in (1a) and *-narhi* 'principal, flattish area (1b) vs. *tsintsikata* 'stone wall' (1c).[112]

(1a) waxa-**nu**-x-ti
sit-**SP.LOC.patio**-AOR-3.S.ASS
'He sat on the **patio**.' (Adapted from Chamoreau, in press)

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

[111] These suffixes are also known as suffixes of locative space (Friedrich, 1971a) or *morfemas espaciales* 'spatial morphemes' (Monzón, 2004). I will use the term 'spatial location' suffix or morpheme, in the spirit of Monzón, to avoid possible confusion with the locative case marker *-rhu*.

[112] However it is worth noting that in an alternative word for 'patio' *teronukwa* or *terunukwa* the SP.LOC for 'principal, flattish objects' *-nu* is clearly observable (Chamoreau, 2003: 223; Velasquez Gallardo, 1978: 76). This term can be analysed as comprising the root *teru-* 'to be in the middle' (Friedrich, unpublished), the SP.LOC for 'patio' and the nominaliser *-kwa*. A similar situation is found in the term *kánarhikwa* 'face' (Chamoreau, 2003: 232), where the SP.LOC *-narhi* can be observed directly after the root *ká-*, here probably in the sense of 'to have something on the body part' (Friedrich, unpublished).

(1c) jupa-**narhi**-ta-xa-p-ka=ri
wash-**SP.LOC.flattish.area**-NCR-PROG-PST-1/2.S.ASS=2.S.SG
'You were washing the **wall**.' (Adapted from Chamoreau, in press)

Aside from the voice/valency suffixes, whose combinatory properties are limited to causative plus one other suffix of the same category (Chamoreau, 2017), the spatial location suffixes are the only morphemes that can co-occur in the same verb slot (see also Section 2.5.1 for a more detailed discussion of the verb template in Purepecha). While the single occurrence of a spatial location suffix is more common, certain combinations of two suffixes are attested, although the same suffix is never reduplicated. Friedrich (1971a: 71-73; see also Monzón, 2004: 46-51) identifies three major (2a) and five minor (2b) spatial suffix combinations which, as a group, he names the 'coupled spatials'.

(2a) Major coupled spatials (Friedrich, 1971a: 71-72)
(i) *-cha* 'narrowing, usually of a longish object at an intersection' + *-nti* 'interior surface of angle on vertical axis'
e.g. *p'amo-cha-nti-ni* 'to covet the food another is eating'
(ii) *-k'u* 'manual' + *-nti* 'interior surface of angle on vertical axis'
e.g. *kuri-k'u-nti-ni* 'to smell foully' (see Section 5.3.1)[113]
(iii) *-nha* 'interior enclosure, cavity' + *-cha* 'narrowing, usually of a longish object at an intersection'
e.g. *arhi-nh(a)-cha-ni* 'to speak enviously of another'

[113] Note that the smell spatial couplet is intransitive, whereas the two other major coupled spatials integrate an external argument, as reflected in the 'other' or 'another' in the translation. I will not elaborate further on valency-increasing operations, but instead refer the reader to Capistrán Garza (2015) and Monzón (2004, esp. ch. 3) for more details.

(2b) Minor coupled spatials (Friedrich, 1971a: 72-73)

(i) *-marha* 'taste' + *-nti* 'interior surface of angle on vertical axis'
e.g. *ampa-marha-nti-ni* 'to clear up (as of the sky)' (cf. Section 5.3.1.1)

(ii) *-mi* 'edge-orifice' + *-cha* 'narrowing, usually of a longish object at an intersection'
e.g. *iki-m(i)-cha-ni* 'to hate or curse someone else'

(iii) *-mi* 'edge-orifice' + *-nha* 'interior enclosure, cavity'
e.g. *iki-m(i)-nha-ni* 'to be angry, enraged'

(iv) *-pa* 'hearth, field, social "front"' + *-nharhi* 'flattish surface, often interior'
e.g. *t'i-pa-nharhi-ni* 'to roast corn'

(v) *-tsi* 'lower surface seen from above' + *-mu* 'edge-orifice'[114]
e.g. *teru-tsi-mu-ni* 'to cross a threshold' (idiomatic or archaic)

As we saw in the single-occurrence examples in (1a-c), the meanings of spatial location suffixes can range from the concrete (i.e. a body part or area) to the abstract (e.g. 'fear' or 'fright'), and the pathway of semantic change may not be easily reconstructible, if at all. A similar situation holds for the coupled spatials.[115] As Friedrich (1971a: 71) notes, "their meaning ranges from the sum of two constituents to something considerably different from that of either." The verb cited in (2b-iv) is a fine example of compositional semantics, since its literal translation is reflected in its component parts, namely: to heat (*t'i-*) the interior surface (*-nharhi*) allofactively[116]

[114] Note that both *-mi* and *-mu* refer to the area identified by Friedrich (1971) as 'orifice edge'.
[115] I follow Friedrich's (1971a) glosses for the spatial location suffixes, which are similar, but not identical, to those given by Chamoreau (2017, following Chamoreau, 2009), Foster (1969) and Monzón (2004) for other varieties of Purepecha. I consider the semantics to be similar enough across authors to be able to follow one author only. Seeing as Friedrich was the first to identify the spatial couplet, I follow his terminology.
[116] Allofactive voice here refers to an action that is carried out by an agent towards an object that is external or distinct from it (Friedrich, 1971a: 8). Middle and reflexive stems, on the other hand, are instances of the "non-allofactive voice", which comprises "actions and states that are somehow immanent in or referring to the subject" (Friedrich, 1971a: 8–9); that is, the event remains in the domain of the subject. (Capistrán Garza, 2015: 206).

in the hearth area (*-p'a*).[117] Examples (2a-ii, iii) instantiate the non-compositional type, where the meanings of the spatial location suffixes do not logically combine to produce the meaning of the derived verb. I will offer a more detailed analysis of the spatial couplets relating to smell (2a-ii) and taste (2b-i) in Section 5.3.1.

5.3. Smell terms in Purepecha

Purepecha speakers have three verbal means at their disposal for describing smells; this is more than English speakers or indeed Spanish speakers which, being bilingual, the Purepecha also are. The first set of terms constitutes roots that only refer to odours when combined with a particular pair of spatial location suffixes. They can be considered abstract in the sense that they are not related semantically or lexically to the sources they describe. As such, I refer to this set as basic terms (see Berlin & Kay, 1969), although when these roots combine with a different spatial location suffix, they then refer to tastes (see Section 5.3.1.1). The second set of terms takes an intransitive root, such as 'to burn', and optionally combines with the spatial couplet morphology that is obligatory for the first set to describe the smell indicated in the root. I label these descriptive terms, following, for example, Burenhult and Majid (2011), and Lee (2015). The third set comprises the root *ja-* 'to be; smell' often combined with the spatial couplet morphology for smell and the source of smell in the form of a noun, often marked in the objective case with *-ni*. I simply call this third set source terms or source-based terms. See Table 16 for an overview of the three types of smell terms.

Smell term type	Morphosyntactic properties
Basic	Smell root + reduplication + spatial couplet
Descriptive	Intransitive root (+ reduplication) + spatial couplet
Source-based	Generic smell root + source noun (+objective case)

Table 16: Smell term types in Purepecha

[117] The terminal suffix *-ni* 'non-finite' does not need to be translated for these examples to make explanatory sense thus it is omitted.

In the sub-sections that follow, I will outline the morphosyntactic properties and semantic boundaries of each set of terms, as well as their relative frequencies in the different types of elicitation methods used to collect data on the language of smell in Purepecha.

5.3.1. Basic terms

Basic smell terms are formed according to a specific morphological template, comprising a reduplicated smell root, the spatial couplet of *-k'u* 'manual' and *-nti* 'interior surface of angle on vertical axis' followed by a combination of context-appropriate verbal morphology, such as tense, mood and person marking (T-M-P), see Figure 12.

Root	Reduplicated root	Spatial couplet (1)	Spatial couplet (2)	T-M-P

Figure 12: Basic smell term template

These basic terms behave as intransitive verbs when grammatically complete. This template is presented in examples (3a-d), which are citation forms of a subset of the eight terms found in the Paul Friedrich Papers at the University of Chicago (Friedrich, unpublished).[118] Note that examples (3a-c) refer to an unpleasant odour, whereas (3d) refers to a pleasant one.

(3a) kini-kini-k'u-nti-ni
stink-RD-SP.LOC.manual-SP.LOC.interior.surface-NF
'to stink (e.g. from body dirt, especially of unwashed person)'

[118] Note that examples from all sources have been adapted to fit the orthographic conventions used in this thesis.

(3b) k'witsi-k'witsi-k'u-nti-ni
stink.bad-RD-SP.LOC.manual-SP.LOC.interior.surface-NF
'to stink badly (e.g. as bar when men have vomited and urinated the night before)'

(3c) uchu-uchu-k'u-nti-ni
stink-RD-SP.LOC.manual-SP.LOC.interior.surface-NF
'to smell (e.g. of fish, soup, etc. after eating, of bad meat, bad breath)'

(3d) p'untsu-p'untsu-k'u-nti-ni
smell.good-RD-SP.LOC.manual-SP.LOC.interior.surface-NF
'to be fragrant, aromatic (e.g. of grilled meat, after rain)'

We can call these terms 'basic' insofar as they bear no formal or functional relation to their prototypical referents or sources. For example, the terms *kurucha* 'fish' and *churipu* 'soup' show no similarity to the verb *uchu-uchu-k'u-nti-ni* 'to smell of fish, soup, etc.' in example (3c), likewise *xiwani* 'to vomit' and *jarhatsini* 'to urinate' are not related to the smell root *k'witsi-* in (3b). The olfactory medium of perception of the root qualities seems to be provided by the spatial couplet, yet this interpretation does not fall out logically from their individual semantics, namely *-k'u*'manual' and *-nti* 'interior surface of angle on vertical axis' (but see Section 5.1.1. for the more transparent case of taste morphology). The main issue lies in the manual nature of the first suffix. While the second suffix could potentially apply to the region under the nose (although not the septum directly, more the general area in which smell might be perceived), the first has no obvious application or extension to that region since hands, fingers, wrists - and its semantic extensions of leaves and material - are not involved in the olfactory experience. How the manual suffix came to contribute to the expression of olfactory experience in Purepecha remains an open question for the moment.

Table 17 lists the 14 basic smell terms[119] identified to date, where they are attested (under the heading 'Ref', where PF stands for Paul Friedrich archive and KB for data gathered by the author), their meaning, and typical sources.

[119] The term *nuranurak'untini* (which has the root *nura-*) 'when something smells like a cloud, or doesn't smell of anything, such as water' was provided at a later date by Armando Lorenzo Camilo, an informant and collaborator in Tacuro, a village in the *Cañada.* Since the term was not attested by any participants during the data collection phase, I leave it as an additional term to be investigated further.

Root	Ref	Meaning	Typical source
janha-	PF, KB	to smell bad all over, to smell intense (bad or good)	Not specific[120]
jio-	PF	to smell bad, stink	Grasses (unpleasant), butter/lard/fat, pig, goat
jore-[121]	KB	to smell bad	Fried onion
kiní-	PF, KB	to stink	Things unwashed, mainly people (body dirt) but also plates, etc.
k'witsi-	PF, KB	to stink badly	Vomit, urine (also places where these have occurred)
one-	KB	to smell bad	Food that is on the turn
p'untsu-	PF, KB	to be fragrant, aromatic	Grilled meat, fresh wet earth/ground/clay, perfume, flowers
sïncho-	KB	to smell bad	Smoke, burning
sïpi-	PF, KB	to stink (foully), smell bad	Old sweat, unclean/unwashed things (including clothes, house, animals) wound, urine, woman's sexual parts , rotten things
sïwi-/ tsïwi-	PF, KB	to smell strongly	Acrid fumes, mainly toasting chilli, dust
tose-	KB	to smell fatty	Fatty foods, fish, meat
tsïke-	KB	to smell strongly	Chilli, something hot or acrid that gets up your nose (like *xiwi-*, this variant is found in Santo Tomás)
tso- /ts'o-[122]	PF, KB	to have a strong smell, to give off fumes. vapour that smarts or bothers/to have a strong smell (usually but not necessarily bad)	Chilli and onion, when cutting or cooking, onions on breath, etc.
uchu-	PF, KB	to stink	Fish, soup, chicken, etc. (mainly after eating), bad meat, bad breath, sexual fluids

Table 17: Basic smell terms in Purepecha

[120] There is an argument for moving *janha-* to the generic category described in Section 5.3.1.1, since it is clearly composed of *ja-* 'to be; smell' and the spatial locative *-nha* 'interior enclosure, cavity', and also has a much less specific set of prototypical referents. It should also be noted that it is a marginal form, having only been elicited from one participant. As such, it will remain in this category with the aforementioned caveats attached.

[121] It is not clear whether the similarity of this form to the root *jorhe-* 'to be hot' is notable.

[122] Friedrich (unpublished) states that these two roots differ as a function of individual variation, although also offers different translations for each one.

It is noteworthy that the terms in Table 17 refer to bad or unpleasant smells in all but three instances: *p'untsu-*'to be fragrant, aromatic' has overtly positive connotations, while *tose-* 'to smell fatty' is neither positive nor negative, and *janha-* 'to smell strongly or all over' can apply to both positive and negative odours. Nonetheless, this preference for negative smell terms is a pattern found in many other olfactory languages (Lee, 2015; Wnuk & Majid, 2014; see also Section 5.1.1). It is also worth noting that two of these basic roots can also take certain derivational morphology to form a noun that expresses an object that is either odorous or produces odour. From the root *k'witsi-* 'to stink badly' we find, notably, the noun *k'witsi-ki* 'skunk', where the suffix *-ki* is a fused nominalising or classifying morpheme (see Section 6.4). From s*ï*pi-/x*ï*pi- 'to stink foully' there is both *xïpi-a-ti* 'medicine' and the less explicable in terms of semantic extension *xïpi-mi* 'mosquito'.

It is notable that these basic terms proved quite difficult to elicit from native speakers in an experimental setting. Indeed, the first attempt at exploring basic olfactory terms fell flat on its face. In this task, Purepecha speakers (N = 12) smelled the 12 scents stored in The Brief Smell Identification Test™ booklet. To release the odour, the participant scratched the brown patch on each page of the booklet with a sharp pencil, and then responded to the question *na jak'untini*? 'how does it smell?' (see Majid, Senft & Levinson, 2007 for the full protocol). This procedure yielded 119 valid tokens, of which 19 (16%) were descriptive (as described in Section 5.3.2) and an overwhelming 100 (84%) were source-based (as found in Section 5.3.3). No basic terms were elicited.

However, it did not prove impossible to elicit basic smell terms from Purepecha speakers. In a follow-up task, participants (N = 13) performed a freelisting exercise, where they were asked to list as many terms for smells that they knew, having just done the same for both colours and body parts. Of the 66 terms (mean = 5) produced by the speakers, 26 (almost 40%) were basic terms, almost half were descriptive terms, while only 7 (11%) were source-based terms. Twelve different basic roots were produced, with only *janha-*, *tipa-* and *jore-* missing from the full list provided in Table 17. The most popular roots were *p'untsu-* and *uchu-*, occurring four times each. This switch in preference for the type of term used may be related to the

nature of the task. The freelisting task allows the speaker more freedom to produce personally or culturally relevant terms and is not constrained by specific odours as it is not odour-oriented. The Basic Smell Identification Kit™ tests for odours that are considered common in the USA (and the West more generally) and as such, they may not be so familiar to the Purepecha speakers. Alternatively (or additionally) these odours may invoke associations with cultural imports, such as *pinoli* 'pine floor cleaner' or *duvalina* 'type of dessert', both brand names that were produced.

Basic terms were also elicited in the 'smell jar' experiment, in which the same participants from the freelisting exercises were given ten plastic jars in succession, each one containing a prototypical odorous source, as identified in Friedrich's (1984, unpublished) work. Despite the preference for bad odours in the basic smell terms, the substances given to the participants to smell were relatively balanced between odours considered positive (grilled meat, fresh wet earth, perfume, flowers, maize and smoky wood) and negative (butter, toasting chilli, cooked onions and fish) to avoid an overwhelmingly unpleasant sensory experience. Naturally certain previously reported odour sources could not be used as stimuli in this experimental setting, including vomit, urine and old sweat. All participants were given the jars in the same order and were asked the same question after opening each jar and sniffing its contents: *na jak'untisti*? 'how does it smell?'. The results were not dissimilar, in terms of distribution of response type, to those elicited from the freelisting exercise. Basic terms comprised 33 of the 124 responses (27%), descriptive terms 55 (44%) and source terms 35 (28%); in both experiments descriptive terms proved the most frequent. Similar to the previous task, 11 separate basic roots were elicited, with *p'untsu-* again the most popular, alongside *sïwi-*, both occurring eight times each. An overview of the three experiments and their respective results, in terms of response type is presented in Table 18.

Experiment	Total no. responses	Type 1 (Basic)	Type 2 (Descriptive)	Type 3 (Source)
Brief Smell ID Kit	119	0 (0%)	19 (16%)	100 (84%)
Freelisting	66	26 (40%)	33 (50%)	7 (10%)
Smell jars	124	33 (27%)	55 (44%)	35 (28%)

Table 18: Type of smell term response elicited by experiment

The smell jars elicited the largest number of responses, closely followed by the booklet. The most basic terms were elicited through freelisting, with descriptive terms quite evenly balanced between the freelisting and smell jar tasks. Source-based terms are overwhelmingly linked to the scratch-and-sniff test, indicating it is the least useful for investigating the specific morpho-syntactic properties of the domain of olfaction with this population.

5.3.1.1. A matter of taste

As indicated above, what I have been calling basic terms are, in a sense, not strictly basic. On the one hand, the roots in this set are monolexemic; they can apply to multiple sources and are not formally related to the words for these sources, rendering them basic. On the other hand, not only can two of the roots take nominal morphology to form odour-related nouns (*k'witsi-* and s*ïpi-/xïpi-)*, but most also serve as taste predicates by removing the root reduplication and replacing the spatial couplet of *-k'u* and *-nti* with *-marha* 'taste'. In this sense, then, they are not basic terms as the root can form part of a verb that refers to a sense other than olfaction. However, it seems reasonable to posit that the root is basic in its semantics, as it is the addition of the spatial suffixes that changes the locus of perception from the nose to the mouth (see the discussion of *-marha* below). I propose that the consequence of this interpretation is that the root should not be translated as 'to stink' or 'to smell bad' but rather be represented by a concept of PERCEIVED FOULNESS or PERCEIVED UNPLEASANTNESS (rendered orthographically in SMALL CAPS to reflect the conceptual nature rather than direct translation of the entry), along with examples of its typical referents, such as

'fish', 'soup' or 'unwashed body'. I develop this proposal of word formation and its implications for the notion of word class in Purepecha in more detail in Chapter 6.

It is likely that the disyllabic suffix *-marha* can be deconstructed into the spatial locatives *-ma* 'presence of liquid or, in its absence, concave space' and *-rha* 'central frontal area external or internal to the secondary volume; central frontal area of an inanimate body or of a surface' (Monzón, 2004: 194-195, my translation). Friedrich does not explicitly state this to be the case in his published work, and Monzón (2004: 192) decides to leave *-marha* out of her list of spatial morphemes, perhaps to avoid the discussion of its internal composition. However, in an unpublished presentation of taste verbs, Friedrich claims that *-ma* and *-rha* are indeed separate morphemes that, when combined, refer to 'the having of taste', with the specific meaning of whatever has the taste being covered by the root. He further relates the *-ma* segment to the set of *m-* stem spatial location suffixes, which all relate to the mouth/chin/jaw area when referring to the human body (see also Chamoreau, 2000: 296-298). A further example of this *m-* stem is the, here reduplicated, root plus spatial locative *tso-tso-mi-* 'to have a bad or acrid taste, like a strong chilli' (Friedrich, unpublished).

In the same way that there are three ways of talking about odours in Purepecha, there are also three ways of talking about tastes. The first is the basic term, as described in Section 5.3.1 for smell, where one of a limited number of specific roots combines with a spatial couplet, here *-ma-rha-*, as in *jio-ma-rha-* 'to taste bad'. The difference in the case of taste is that the root is not obligatorily reduplicated. A list of basic taste predicates, adapted from Friedrich's (1971a: 204) list of roots taking *-ma-rha* 'taste, speech, oral' is found in Table 19.

Taste predicate	English translation
jio-ma-rha-ni	to have a bad taste
kwata-ma-rha-ni	to taste well
shunha-ma-rha-ni	to taste unpleasant, as of unripe fruit, vegetables
sïncha-ma-rha-ni	to taste charred, burnt
sïra-ma-rha-ni	to have a bad taste, of smoke and fumes
tsere-ma-rha-ni	to taste somewhat bitter
tsïre-ma-rha-ni	to taste badly, especially of badly baked bread
uri-ma-rha-ni	salty

Table 19: Basic taste predicates in Purepecha[123]

In the list on which Table 19 is based, Friedrich (1971a) also mentions *tse-ma-rha-ni* 'to speak well, courteously', although in his unpublished dictionary he states that the same root can combine with *-marhi* 'orifice-edge' or *-ntira* 'jaw, teeth, chin' and still produce the same meaning. We may be dealing here with dialectal variation, although note that all forms relate to the mouth area, where tasting and speaking both occur. Note also the form *tse-n-tse-ma-rha-* 'to speak softly, gently, but clearly', where the root is reduplicated for emphatic reasons, and an epenthetic *-n-* inserted. In addition, he includes separately two instances that contain the *-ma-rha* couplet but do not fit into the set as they have no taste/speech/oral connotations: *amba-ma-rha-nti-ni* 'to clear up, said of sky' from the root *amba-* 'good, well' and *warhi-ma-rha-nti-ni* 'to be partly depopulated, with many dying' from the root *warhi-* 'ideas of death'. It is likely that the lack of taste or speech association stems from the addition of a second (in Friedrich's terms, a third in mine) spatial location suffix, in both cases *-nti* as seen above. The latter term is also an excellent example of the difficulties inherent in assigning concrete meaning to a bare root.

Second, descriptive terms comprise roots referring to more generic sensory qualities such as *xarhi-* 'to be sour, tart', *te-* 'to be sweet', *tipa-* 'to burn, itch', see

[123] I have removed *te-ma-rha-ni* 'to taste salty' from this list of basic terms as it clearly stems from the root *te-* 'RELATING TO SWEETNESS'. It is likely, moreover, that this translation is incorrect. The root *te-* clearly relates to sweetness, so the translation would more appropriately be 'to taste sweet'. I can only assume this was an accidental oversight on Friedrich's part.

(4a-b). Note that loanwords from Spanish are underlined in the examples where they occur.

(4a) xarhi-marha-ni mas bien
sour-SP.LOC-NF more well
'Better, it tastes sour.'

(4b) isïku pera-ma-rha-ni
like.this pucker.unpleasantly-SP.LOC-SP.LOC-NF
isï ja-ma-rha-ti
like.this be-SP.LOC-SP.LOC-3.S.ASS
'Like this, it tastes unpleasant (sour)'

Third, the source of the taste, usually a noun optionally marked with the objective case marker *-ni*, is introduced with a generic perception verb *ja-* (discussed in more detail in Section 5.3.3) and combined with the spatial couplet morphology *-ma-rha*, as in *remedioni jamarhati* 'it tastes like medicine' (where *remedio* is a loan from Spanish expanded with the Purepecha objective marker). See also example (5) and the second half of (4b).

(5) isïku etu-mi-ni isï
like.this salt-SP.LOC-OBJ like.this
ja-ma-rha-ti
be-SP.LOC-SP.LOC-3.S.ASS
'Like this, it tastes salty.

Many languages conflate perceptual categories, whereby the same verb may refer to multiple senses, as in Luo (Western Nilotic) where 'hear' also covers touch, and with modification, taste and smell (Levinson, Majid & Enfield, 2007: 11-12). Moreover, in premodern India, odourous objects were also potentially audible due to their being carried by the wind and indeed 'wind' means 'odour carrier' in Sanskrit (McHugh,

2012: 58). Yet although olfaction and taste share the same roots in Purepecha, the presence of different spatial couplet morphology clearly delineates the two senses, both semantically and formally. It cannot be claimed, as is the case for Luo, that a smell predicate is being used as a taste predicate or *vice versa* since neither term is derived or adapted from the other in Purepecha. Rather the root itself is basic, requiring further morphology (here spatial location suffixes) in order to be interpretable. I therefore argue against a conflation of the senses linguistically speaking, emphasising instead, and again, how word formation in Purepecha proceeds from a seemingly semantically underspecified root coupled with specific, also sometimes also semantically opaque, suffixes (see Chapter 6).

5.3.2. Descriptive terms

Descriptive terms in Purepecha are somewhat analogous to the English constructions of the type 'it smells burnt' or 'it smells sweet'. This set of terms takes as its base a root that can refer to an event or state not restricted to smell, such as *kurhi-* 'to burn', or *te-* 'to be sweet'. These roots also optionally combine with the spatial couplet of *-k'u* and *-nti*, followed by the required inflectional morphology to form a smell predicate that refers to something that smells like the root suggests, e.g. *kurhi-kurhi-k'u-nti-ni* 'to smell badly, like buzzard, burnt feathers, unwashed old man', see also (4).

(4)	isïku	enka=ksï	arhi-ka
	like.this	that=1/3PL.S	say-1.S.ASS
	xarhi-xarhi-k'u-nti-ni		arhi-ni
	sour-RD-SP.LOC-SP.LOC-N F		say-NF
	'Like this when I say [it] smells sour'		

A list of the terms identified in the literature, through elicitation and from a follow-up list compiled by collaborator Armando Lorenzo Camilo is presented in Table 20.

Root	Root meaning	Olfactory meaning
jikwa-	to wash	to smell washed, e.g. something clean or something brand new
k'ame-	to be bitter/sour	to smell very bitter/sour
kurhi-	to burn	to smell badly, like buzzard, burnt feathers, unwashed old man
kw'itu-	to be splashed, spattered with mud, dirt	to smell of grime, dirt, e.g. a person who hasn't washed or dirty clothes
porho-/purhu-	to boil	to smell rotten
(t)pu-	fluffy mould	to smell rotten or mouldy
te-	to be sweet	to smell sweet
tipa-	to burn, itch	to smell acrid, as when toasting chillies
ts'uni	to flatulate	to smell of fart, e.g. gas
xarhi-	to be sour, acidic	to smell sour, acidic

Table 20: Descriptive smell predicates in Purepecha

These descriptive roots possess more clearly independent semantics than the basic term roots, a connection that is observable in the similarity of meaning between the second and third columns of Table 20. Nonetheless the roots still require derivational suffixes for further specification, when used as smell or other predicates, as exemplified here using *kurhi-* 'to burn' and *kurhu-* 'to burn, singe'. This specificity can alter the transitivity of the verb, as in (5a-b), where the suffixes *-p'i* and *-p'a* indicate the intransitive or transitive nature of the action respectively.[124]

(5a) ch'kari kurhu-p'i-s-ti
wood burn-SP.LOC.hearth-AOR-3.S.ASS
'The wood burned (down)'

[124] Note that some spatial location suffixes, such as *-p'i* and *-p'a-* here, as well as *-ta* as in *mi-ta-kwa* 'key' (lit. 'thing that makes open', where *-ta* is a causative marker) also have a valency function, see Section 1.5.2.

(5b) tataka kurhu-p'a-s-ti juata
young.man burn-SP.LOC.hearth-AOR-3.ASS hill
'The young man burned the hill (down)'
(Adapted from Chamoreau, 1998: 203)

Spatial location suffixes can also specify the location of an action or state, here burning. The location can either be on the body (6a) or outside it (6b-c), as demonstrated neatly with the almost minimal pair with *-k'u* (of spatial couplet fame, here appearing alone) in (6a-b).

(6a) kurhi-k'u-xa-ka=ni (jak'i-rhu)
burn-SP.LOC.manual-PROG-1/2.ASS=1/2 (hand-LOC)
'I am burning my hand' (Adapted from Chamoreau, 2003: 121)

(6b) kurhi-k'u-ku-x-ti (ch'kurhi-ni)
burn-SP.LOC.manual-NCR-AOR-3.ASS (leaf-OBJ)
'He burns the leaf' (Adapted from Chamoreau, 2003: 121)

(6c) kurhi-tsi-ni
burn-SP.LOC.downwards-NF
'To burn underneath, as of beans in a pot'
(Adapted from Friedrich, 1971a: 240)

More idiomatic and less compositional interpretations are also possible with these semantically heavier roots, as demonstrated in (7), where the concept of accusing is difficult to derive from the causative suffix *-ra* in combination with a root referring to burning. One could speculate that the action of accusing might figuratively make the accused burn, perhaps of embarrassment, which could be manifested through blushing, as in the burning of the cheeks.

(7) kurhi-ra-ni
burn-CAUS-NF
'To accuse another'

Moreover, these descriptive roots can take word-class changing morphology to function in an adjective-like fashion (see also Section 1.5.2 for a discussion of adjectives in Purepecha) as the complement of the generic verb *ja-* 'to be, to smell' (8a), contrasted with the descriptive structure in (8b). I will discuss the form and semantics of this and other generic smell verbs in more detail in Section 5.3.3.

(8a) sani xarhi-pi-ni isï
very sour-ADJ-NF like.this
ja-k'u-nti-sïn-ni
smell-SP.LOC-SP.LOC-HAB-NF
'Like, it smells very sour.'

(8b) este es un alimento descompuesto
DEM be.3SG a foodstuff rotten
xarhi-xarhi-k'u-nti-ni
sour-RD-SP.LOC-SP.LOC-NF
'This is a rotten foodstuff, it smells sour.'

The case of *xarhi-* 'sour, tart' (8a-b) again highlights the multivalent nature of both the root and the spatial couplet, here *-k'u-nti,* with the same statement also holding for the taste spatial couplet *-ma-rha*. The structure presented in (8a) can also include a noun instead of an adjective-like word, as in (9), where the contrast between a nominal complement, here 'chocolate', of the generic smell verb, as well as the descriptive term *sensu strictu* (i.e. *te-* 'to be sweet') can be observed.

(9) i isïku[125] chocolati-ni ja-k'u-nti-sïn-ti
and like.thi chocolate-OBJ smell-SP.LOC-SP.LOC-HAB-3.S.ASS
sesi te-te-k'u-nti-ni
well sweet-RD-SP.LOC-SP.LOC-NF
'And like this it smells like chocolate, very sweet.'

Descriptive terms constituted the most common response type in both the freelisting and smell jar elicitation tasks (see Table 18). They were also the only other response type offered in the Brief Smell Identification Test™ task aside from source-based terms, albeit with a low frequency of only 16% of total tokens. I will now turn to these source-based terms.

5.3.3 Source terms

Source terms are similar to the ostensive constructions familiar to English speakers, such as 'it smells of bacon' or 'like bacon' (see McHugh, 2012: 64). In short, they refer to the object that emits the odour being described. In Purepecha the source is generally a noun that appears in the objective case preceding or following (recall that constituent order is flexible) the generic verb root *ja-* 'to be; to smell'. This root takes the spatial couplet morphology for smell (*-k'u-nti*) to form a generic intransitive smell verb. See examples (10a-d).

(10a) i isïku urhusï-ni
and like.this Montezuma.pine-OBJ
ja-k'u-nti-sïn-ti
be-SP.LOC-SP.LOC-HAB-3.S.ASS
'And this smells of Montezuma pine.'

[125] Note that the terms *isï* and *isïku*, both 'like this', are used interchangeably.

(10b) i sesi planta-ni ja-k'u-nti-ni[126]
and well banana-OBJ be-SP.LOC-SP.LOC-NF
'It smells a lot of banana.'

(10c) xapu-ni ja-k'u-nti-ni
soap-OBJ be-SP.LOC-SP.LOC-NF
'It smells of soap.'

(10d) isïku tsïtsïki-ni ja-k'u-nti-sïn-ti
like.this flower-OBJ be-SP.LOC-SP.LOC-HAB-3.S.ASS
'This smells of (a) flower.'

An additional, and very neat, example of the multivalent nature of Purepecha suffixes is illustrated in (11). Here the descriptive root *k'ame-* 'to be bitter' is nominalised and combined with the generic smell verb (including the smell spatial couplet), followed by its descriptive use. Both types are linked with a Spanish coordinator (here acting more as a filler) *como* 'like'.

(11) k'ame-kwa ja-k'u-nti-sïn-ti isï
bitter-NMZR be-SP.LOC-SP.LOC-HAB-3.S.ASS, like.this
como sani k'ame-k'ame-k'u-nti-ni
like very bitter-RD-SP.LOC-SP.LOC-NF
'It smells bitter (lit. of a bitter thing), so, like it smells very bitter.'

As indicated in Section 5.3.1, source-based terms comprised the vast majority (84%) of responses to the Brief Smell Identification Test™. Within this set 60% were loanwords, overwhelmingly nouns, from Spanish. Where applicable, the loanwords were generally adapted to Purepecha morphology, notably with the addition of the -

[126] Note that the infinitive is used frequently instead of a conjugated verb when the subject is obvious or has already been introduced (see Chamoreau, 2016).

ni objective suffix to nouns, e.g. *chicli-ni* 'chewing gum', and/or to Purepecha phonology, especially salient in the raising of /o/ to /u/ and /e/ to /i/, as in *sigaru* from *cigarro* 'cigarette', *perfumi* from *perfume* 'perfume' and *aceiti* from *aceite* 'oil'.[127]

5.3.3.1. Generic verbs meaning 'to smell'

In contrast with the types of terms presented in Sections 5.3.1 (basic) and 5.3.2 (descriptive), the source of an odour in Section 5.3.3 is indicated by the noun for this source, introduced by the root *ja-* combined with the spatial couplet morphology *-k'u-nti-*. However it is not the only root that can be used in a more generic sense. Two more roots can also refer to olfactory experiences or states, namely *p'untsu-* and *sïpi-*, although these do not obligatorily take the olfactory spatial couplet morphology, nor are they reduplicated as basic roots are. Recall that all three of these roots appear in Table 17 as basic terms whose semantics are largely evaluative, that is they express a hedonic statement regarding the odour such as 'to stink' or 'to smell fragrant'. In the more generic sense presented in this section, these terms do not explicitly reflect a hedonic statement but rather three different event types.

Viberg (1984, see also Viberg, 2015) identifies three main components for distinguishing between verbs of perception (not only olfaction): activity, experience and state (copulative). An activity refers to "an unbounded process that is consciously controlled by a human agent, whereas experience refers to a state (or inchoative achievement) that is not controlled" (Viberg, 1984: 123). With reference to vision, for example, 'to look' is an activity whereas 'to see' is an experience, since the former implies agentivity while the latter does not. Both activities and experiences are experiencer-based, whereby the subject of the perceptual predicate is a conscious, animate being, e.g. 'the boy is looking at the birds'. A source or phenomenon-based verb, on the other hand, source-based (also known as phenomenon-based) verb takes the experienced entity as its subject, as in 'the man looks weird' (Viberg, 1984: 124).

In order to investigate the distribution of the three basic roots that can also be used in a more generic olfactory sense, I distributed a questionnaire based on the

[127] Note here that I use the orthography provided by the respondents, thus it contains a certain amount of inconsistency.

sentences in Viberg's (1984: 125) basic paradigm for verbs of perception. The 20 target sentences (five per sense) were first translated into Spanish and the names changed to make the questionnaire both more culturally relevant and less repetitive. The original sentences, their Spanish translation and the predicate type, according to Viberg's (1984) typology are presented in Table 21.

English sentence	**Spanish translation**	**Predicate type**
Peter smelled the cigarette (to see if he could smoke it)	Jorge olió el cigarrillo (para ver si podría fumarlo)	Activity
Peter was smelling the cigarette (to see if he could smoke it)	Ivan olía el cigarrillo (para ver si podría fumarlo)	Activity
Peter smelled cigarettes in the room	Abril olió cigarrillos en la habitación	Experience (state/inchoative)
Peter smelled good	Ana olía bien	Source-based: Copulative (state)
Peter smelled of cigarettes	Humberto olía a cigarillos	Source-based: Copulative (state)

Table 21: Target sentences for olfaction verbs translated into Spanish (following Viberg, 1984: 125)

Participants (N = 13) translated the sentences from Spanish into Purepecha, following the only instruction 'in the most natural way possible'. This exercise yielded 65 roots, distributed between *ja-* (9), *p'untsu-* (17) and *sïpi-* (31; also written as *süpi-*, *xipi-* and *xupi-* due to orthographic variation amongst speakers), as presented in Table 21. The grey shaded areas indicate 0-3 tokens of that root for a particular verb type, indicating it is either not used for that type or is marginal.

Type of verb	Root		
	ja-	**p'untsu-**	**sïpi-**
Activity	0	5	**8**
Activity	0	4	**9**
Experience (state/inchoative)	0	4	**9**
Source-based (copulative)	**7**	3	3
Source-based (copulative)	**10**	1	2
Total	**9**	**17**	**31**

Table 22: Olfactory verb types and their expression by root in Purepecha

The results from Table 22 indicate that *ja-* has a more limited distribution than *p'untsu-* and *sïpi-*. It can only be used in source-based constructions without an animate agent or experiencer, as in the two target sentences *Ana olía bien* 'Ana smelled good' and *Humberto olía a cigarillos* 'Humberto smelled of cigarettes', see (12a-b) for examples from two Purepecha speakers.

(12a) Ana sesi ja-k'u-nti-xa-p-ti
Ana well be-SP.LOC-SP.LOC-AOR-PST-3.S.ASS
'Ana smelled good.'

(12b) Humbertu sïgaru ja-ma-rha-xa-p-ti=ni[128]
Humberto cigarette be-SP.LOC-SP.LOC-AOR-3.S.ASS=1.SG
'Humberto smelled of cigarettes.'[129]

This usage mirrors that which we observed in Section 5.3.3, where the odour source, here indirect in (12b), should be explicitly stated. It should also be noted that the *ja-* responses were split almost equally between those expanded with *-k'u-nti-*, the spatial couplet for smell (e.g. (12a)), and those expanded with *-ma-rha-*, the spatial couplet for taste (e.g. (12b)). It is possible that this variation stems from the proximity of the

[128] The use of the first person subject clitic *=ni* here is non-standard but retained for authenticity.
[129] Note the Purepechisation of the Spanish word *cigarro* as introduced in the previous section.

two senses, both lexically and in terms of physical perceptual experience. I noted in Section 5.3.1.1 that it is common for smell and taste to be lexically conflated cross-linguistically, and our results here may be a reflection of such an overlap (see also Section 5.4.4 for a historical perspective).

The roots *p'untsu-* and *sïpi-* were also attested for source-based verbs, but their frequency was low: 4/26 (15%) and 5/26 (19%) respectively. However it is noteworthy that the participants who used these two roots differentiated less between the verb types. Three participants used the same root (two for *sïpi-* and one for *p'untsu-*) for all sentences relating to olfaction, two used one root each to translate all the sentences except that in (12b), where they used the other, and one participant used all three roots, with no apparent consistency.

The root *p'untsu-* is used for all three verb types, activity, experience and source-based, but is most commonly used with activity verbs (53%), where the subject is an animate agent, consciously smelling the odorous object. In addition, it is used equally with experiencer and source-based verbs (23.5% each), as noted above for the latter. Examples of the more canonical usage can be found in (13a-b).

(13a) Jorge p'untsu-ru-s-p-ti cigarru
Jorge smell-SP.LOC-AOR-PST-3.S.ASS cigarette
'Jorge smelled the cigarette'

(13b) Ivani itsutakwa-ni sïpi-ru-sa-an-ti
Ivan cigarette-OBJ smell-SP.LOC-PROG-PST-3.S.ASS
'Ivan was smelling the cigarette'

Experiencer verb types were also attested with *p'untsu-*, but only as a minority, see (14a), as were a small number of source-based verbs (14b).

(14a) Abril cigarru p'untsu-ru-p-s-ti cuartu-rhu
Abril cigarette smell-SP.LOC-PST-AOR-3.S.ASS room-LOC
'Abril smelled cigarettes in the room.'

(14b) Ana p'untsu-ru-p-s-ti sesi
Ana smell-SP.LOC-PST-AOR-3.S.ASS well
'Ana smells good'

The most frequently attested root was *sïpi-*, representing 31/65 (48%) of all responses. It too was most frequently used with activity verbs (17/31, or 55%), see example (15a), but it was also the most common root for experience-type verbs (15b). Its use as a source-based verb has already been mentioned. Note also the common use of the spatial locative *-r(h)u*[130] 'point, projection of something longish', which can refer to the nose, forehead, point, flower or seed, (Friedrich, 1971a: 16) suffixed to both *p'untsu-* and *sïpi-*. This suffix is not used with the basic or descriptive terms, which are intransitive verbs, but seems to be used here to derive transitive verbs from the generic roots by adding an argument (contrast this with the 'smell of X' construction in 5.3.3).

(15a) Ivan xipi-ru-xa-p-ti itsutakwa-ni
Ivan smell-SP.LOC.nose-AOR-PST-3.S.ASS cigarette-OBJ
'Ivan was smelling the cigarette.'

(15b) Abrili sïpi-ru-ø-ti itsutakwa-ni troja-rhu
Abril smell-SP.LOC.nose-PST-3.S.ASS cigarette-OBJ room-LOC
'Abril smelled cigarettes in the room.'

[130] Friedrich (1971a) renders this suffix with the retroflex tap, but many of the participants in the perception questionnaire used the simple flap /r/. I take them to be the same suffix.

In addition to these roots, Friedrich (unpublished) mentions the activity root *t'unú-* 'to sniff, as of dogs, with any body part suffix for body part that can be sniffed', although this root was not elicited in any of the fieldwork tasks.

To sum up, Purepecha makes use of three roots - *ja-*, *p'untsu-* and *sïpi-* - to express the three categories of olfactory experience as defined by Viberg (1984): activity, experience, and source. These three roots demonstrate a certain amount of overlap, especially *p'untsu-* and *sïpi-*, with the latter being almost twice as popular as the latter. Both roots are attested for all three verb types although considerably less for source-based verbs, which are dominated by *ja-*, in combination with the spatial couplet for smell or taste equally. This root is the only one of the three with very clear-cut semantic boundaries, since it is not attested for activity or experience verbs. The flexibility of the other roots may be facilitated by the ability of both to take the spatial locative *-r(h)u*, which refers to the nose and thus offers greater olfactory emphasis as well as an apparent valency-increasing function. Having presented the contemporary situation with respect to olfactory language, I will now turn to its role in early modern Purepecha.

5.4. Historical perspective

In his impressive work on the evolution of odour representation in pre-modern South Indian religious texts, McHugh (2012) claims that the vocabulary used to describe smells is contingent on a certain time, place and culture, introducing the idea that different 'canons' of smells exist in different periods of time, represented for him by periods of texts. With regard to South India, he notes that references to and associations of more 'natural' odours, such as fish, lotus, meat, and earth, remained relatively constant over time, whereas those related to aromatics evolved (McHugh, 2012: 87). As such, we could expect to find changes, or an evolution in the smellscape in earlier forms of Purepecha. Indeed the notion that different odours can dominate in different periods leads to the consultation of the two main early historical documents on the Purepecha language: (i) an extensive, two-volume dictionary from the late sixteenth century, known as the *Diccionario Grande* (Anonymous, 1991), and (ii) the *Relación de Michoacán* (henceforth RM), a description of the prehistory of the

Wakusecha, the dominant group within the prehistoric Tarascan State (see Section 1.3.2).[131] The RM was compiled between 1538 and 1540 and delivered to the viceroy of New Spain in 1541 by the Franciscan friar Jerónimo de Alcalá, who had acted as both scribe and interpreter for the Purepecha informants, including the *petamuti* 'chief sacrificer' (Pollard, 2016: 59; Craine & Reindorp, 1970: vii). Identifying references to odours in these two texts allows us to gain an impression of the historical canon of scents in Purepecha.

Let us begin with the lexical entries in the *Diccionario Grande*. A total of 14 smell terms are attested in this work, of which 10 are basic terms and the remaining four are descriptive terms.[132] The same total number of basic terms is attested in Modern Purepecha (see Section 5.3.1). A full list of terms collected from the *Diccionario Grande* is presented in Table 23, followed by the bare smell root in contemporary orthography and its translation. Entries preceded by an asterisk have been analysed or identified as descriptive terms, i.e. which refer to a state or event that is not fundamentally olfactory such as 'to burn' (see Section 5.3.2). In addition to these terms, *t^{h}unumbarihpeni* 'to smell like dog (of people)' is also attested in the sixteenth century source, as well as in the Friedrich archive (see Section 5.3.3.1), although as a transitive, agentive verb I will not include it in this historical canon.

[131] As indicated in Sections 1.4 and 4.2, a second, even earlier dictionary is available for Purepecha (Gilberti, 1559), as is a grammar (Gilberti, 1558). However. the *Diccionario Grande* is widely considered to be a more comprehensive work that was in all likelihood compiled either by or with the help of native Purepecha speakers rather than (predominantly) by outsiders, i.e. Spanish friars. As a result, I will only use the latter source in this analysis.

[132] Note that I list the three terms beginning in *je-* as separate terms, as in the *Diccionario Grande*, although it is highly likely that they are all derivations of the root *je-* or *ji-*, whose meaning remains unclear. However the root *jir(h)u-* appears to contain the spatial locative *-rhu*, which refers to the nose area (see Section 5.3.3.1).

Diccionario Grande entry	English translation	Modern root	Meaning
hamara-	to smell good or bad the part indicated	ja-	to be
hecume-, herume- ,	to stink of something rotten, to sink of putrefaction	jiku- jir(h)u-	Not attested Not attested
hecuueme-	(same as hecume-), to stink of urine or damp, etc	jik(w)u-	Not attested
puntzuma-/me-	to smell fragrant	puntsu-	to be fragrant
*quatsi-	to stink	kwatsi-	to defecate
quinguimara-	to stink of saltpetre	kini-	to stink (esp. of unwashed person)
sipia^{h}-, sipi-	to smell, stink badly	sipi-	to stink foully
*teremarahcarani	to stink (of house)	tere-	to be rotten
tocemara-	to stink of goat, etc	tose-	to smell fatty
caquimarandeni	to smell of goat (re: place)	tsaki-	Not attested
tsiquimara^{h}-	to stink of burnt chilli	tsike-	to smell strongly
tzunamara-	to smell of milk, etc	tsunha-	Not attested
uchu-	to smell of fish	uchu-	to stink
*xungomarauacurani	to smell of cooked herbs	xunha-	to be green
yndamarandeni	to smell of butter or fat	inta-	Not attested

Table 23: Smell roots in 16th century Purepecha from the *Diccionario Grande*

Eight of the 14 terms are attested in both the sixteenth century and the modern language, although *quatsi-* (*kwatsi-* in modern orthography) 'to defecate' (Friedrich, unpublished; see also Velásquez Gallardo, 1978: 38) clearly still exists in the modern

language but has not been attested thus far with smell semantics.[133] Moreover, if one assumes that butter or fat and cooked herbs do not emit a pleasant smell, which holds for the modern language for the former at least, then only one term in Table 23 has positive connotations. This preference for negative hedonic statements is paralleled in the modern canon of smell terms, as well as in the inventories of other languages (e.g. Lee, 2015; see also Section 5.1.1).

Moreover, the majority of the historical smell roots in Table 23 are listed together with the suffix *-mara* , which is the same suffix pair as *-ma-rha-,* relating to taste and the mouth (see Section 5.3.1.1.), followed by additional spatial location morphology for more specific localisation. The frequent presence of this suffix pair, and the absence of the *-k'u-nti-* that is found with the modern basic terms, suggests that there may have been a shift in the expression of odour semantics, from a general taste-smell spatial couplet to individual ones for each sense. Indeed taste morphology may (pre-)historically have applied to both taste and smell, as it still can, with the smell spatial couplet emerging only later. It should also be acknowledged that the strong emphasis on location may simply reflect an attempt on the part of the creator/compiler of the dictionary to provide as comprehensive a set of entries as possible. That said, the body is clearly a key orienting principle for events, actions and states in Purepecha (Friedrich, 1984: 60), even if the historical explanation for this focus is not immediately forthcoming (see also Enríquez Andrade, 2012: 43-44 for a presentation of bodyparts and odour terms in Totonac). The main issue in relation to the change in spatial couplet morphology is the lack of intermediate textual evidence, namely from the seventeenth to the early twentieth century, which would facilitate further research on this issue.

As an example, let us look more closely at the entry for the root *hamara-* (*ja-ma-rha-* in modern orthography) 'to smell good or bad the part indicated'. Here we find multiple sub-entries constructed with the related derivative *hanga-*, i.e. *ja-* 'to be' plus *-nha* 'interior enclosure, cavity'. These two elements are supplemented by

[133] It should also be noted that simply because a term has not been attested in the modern dictionary or in the field data collection does not mean it does not still exist. Lexical differences do occur in the Purepecha dialects, therefore it may be that the sixteenth century terms were taken from different varieties of the language than the present study.

additional spatial location morphology, such as *-nti* 'interior surface of angle on vertical axis' (to refer to a generic place), to specify which body part or location smells, as in (16).[134]

(16) janha-ma-rha-nti-ni 'to smell a lot (of a place)'
janha-ma-rha-k'u-ra-ni 'to smell good (of hands)'
janha-ma-rha-ch'a-ni 'to smell good (of throat/neck)'
janha-ma-rha-re-kwa-re-ni 'to smell good (of the whole body)'
janha-ma-rha-ntsi-ni 'to smell good (of head)'
janha-ma-rha-tsi-ka-ni 'to smell good (of low parts)'

On the whole there is much more emphasis in the *Diccionario Grande* on how places, including body parts, smell than in Friedrich's dictionary and other references to olfaction in Purepecha. Nonetheless, we can identify the same three types of smell terms, whose classification was elaborated in Sections 5.3.1 to 5.3.3, as demonstrated in examples (17a-c), where the original orthography is in the first line, followed by the modern adaptation in the second line.

(17a) Vchu-ma-ra-nde-ni (Type 1: Basic)
uchu-ma-rha-nti-ni
smell-SP.LOC-SP.LOC-SP.LOC-NF
'to stink of fish'

(17b) Tere-ma-ra-hcha-ni (Type 2: Descriptive)
tere-ma-rha-ch'a-ni
smell-SP.LOC-SP.LOC-SP.LOC-NF
'to stink rotten (of neck)'

[134] Note that the orthography has been adapted to the modern conventions used elsewhere in this paper.

(17c)	churipu	en	ha-ma-ra-nde-ni	(Type 3: Source-based)
	churipu	eni	ja-ma-rha-nti-ni	
	soup	is[135]	be-SP.LOC-SP.LOC-SP.LOC-NF	
	'to smell of soup'			

In line with the flexibility and overlap of generic smell roots that we saw in Section 5.3.3.1., there are also examples of both roots given for the same entry in the *Diccionario Grande*, such as *hamarahcarani* ~ *sipimarahcarani* 'to stink badly (of house)', where both *ja-* and *sïpi-* are attested. This overlap reflects that which is observed in the modern language, where *ja-* is preferred for source-based (copulative) verbs such as 'Ana smelled good', with the other two roots occurring in the same context but with a much lower frequency.

Even though the *Diccionario Grande* places great emphasis on the location of an odour, the general meaning of the terms shared with the modern language is largely equivalent. The main exception to this generalisation is *tocemara-* which refers predominantly to 'the (bad) smell of goat' while the modern root *tose-* refers more to 'the (bad) smell of something fatty'. The root *quingui-/kini-*, whose main referent is 'saltpetre' in the sixteenth century dictionary but 'unwashed person' in the modern language, may also seem to be another exception at first sight (or sniff!). However, saltpetre has a slight smell of urine which may also emanate from a person who has not washed for some time. As such, it appears that different referents are being used, in some cases, to refer to the same, or at least a similar, unpleasant odour. Taken together, the considerable proportion of shared roots, the preference for negative terms and the semantic similarities indicate that olfactory language has proved relatively robust and stable across time in Purepecha. As such, we do not seem to be dealing with what McHugh (2012: 17-19), following Baxandall (1988), calls the "period nose", which would predict that sixteenth century Purepecha speakers would perceive and evaluate odours in a different way to their modern-day descendants. Aside from the difference in spatial couplet morphology, the historical terms do not

[135] It is not certain that this lexeme is a contraction of *eni* 'to be', which has since fallen out of use, having grammaticalised into the predicativisor -i or -e (see Section 1.5.2).

differ significantly from those attested and elicited in the modern language in semantic (i.e. regarding their main referents) or formal terms.

In contrast, the RM offers a far less negative perspective of smell in late prehispanic and early colonial Purepecha culture. In this work almost 20 references are made to *olores* 'smells, fragrances', predominantly with reference to smoke or incense. Fire and smoke played a key role in certain Tarascan[136] religious ceremonies, including those carried out before going to war; in fact most of the references to fragrances appear in the descriptions of preparations for war. Moreover, one of the most important gods, Kurikaweri (also spelled Curicaveri, Curicaueri, Curicaberi, amongst others in the RM) 'he who emerges burning', was the *Wakusecha* god of war, suggesting also a connection between the terrestrial and celestial beings through an odorous substance, here smoke.[137]

Indeed the RM relates how, before departure for war, the *Cazonci* ordered villagers to collect wood, which they stacked in large piles in temples throughout the region. These wood piles were lit so as to create large fires over which prayers and exorcisms were conducted by priests known as *Jiripacha* (singular: *Jiripati*[138]). Together with five sacrificers and five priests known as *Curitiecha* 'the knowers of burning', the *Jiripacha* would make little balls of fragrance from incense and tobacco known as *andumukwa* 'bile, tobacco, henbane (*Hyoscyamus niger*)'.[139] The *andumukwa* were attached to branches in the wooden pyre and later cast into the fire by the priests so that the gods would grant the Tarascans victory over their enemies, including by causing illness in their villages. Before burning the fragrance balls, the *Jiripacha* would preach, explaining how the god Kurikaweri had ordered the wood to

[136] 'Tarascan' is generally used in the archeological and (ethno-)historical literature to refer to the inhabitants of Michoacán prior to the arrival of the Spanish, as well as in the early modern period. I follow this convention here.
[137] Pickering & Beekman (2016: 13) note that the Old Fire God was the single most recognisable Mesoamerican deity prior to the Epiclassic (around 800-900 CE).
[138] The loss of *-ti* in the plural is unexpected. A direct translation of this name is difficult, although the term is easily glossed: *jiri-pa-ich*a 'to seek-DIR.CENTRIF-PL'. Its meaning suggests looking to leave a point, reflecting the imminent departure for war.
[139] "The use of "balls of fragrance" seems to have been a trait held in common in much of Mesoamerica […]. The Tarascans gathered resin from various tropical trees, which they made into little balls for use in religious ceremonies and apparently at any time an important decision had to be made. At times the balls were also made of tobacco. These little balls, when placed in fire, burned slowly and gave off an odor that was pleasing to the gods" (Craine & Reindorp, 1970: 20, footnote 2).

be burned as an offering of the gods. They would take a ball of fragrance and offer this prayer to Kurikaweri: "Thou God of Fire who hast appeared in the midst of the houses of the chief priests, perhaps there is no virtue in this wood which we have brought to the temples and in these fragrances which we have here to give thee" (Craine & Raindorp, 1970: 20-21). The priest would then call out the name of each of the enemies' lords, thus: "Thou Lord, who hast in charge all the people of such and such village, receive these fragrances and let there be a few of your vassals for us to take in the war" (idem.). This ceremony was performed on two nights, with the words of the prayers directed to the four quarters of the world and to hell. Once the prayers were finished, the balls of fragrances were thrown on to the fires (de Alcalá, 1956 [1574]; Craine & Reindorp, 1970).

The odours of incense and smoke were considered to be perceptible to the gods, as exemplified in the following interaction between Tariacuri (the main hero of the RM and the unifier of the Tarascan Empire) and his nephew Tangaxoan regarding the arrival of Xaratanga, goddess of Tariaran (probably the modern-day town of Zirahuen, to the south-west of Lake Pátzcuaro):

> "'How can you bring her here? There are many dangers along the way. […] Go clear her temples and her throne and place the incense there, make fires and smoke in that place for she will smell them when she comes.' Tangaxoan replied that he had cleared that place and throne." (Craine & Reindorp, 1970: 206, emphasis added).

As indicated above, tobacco was one of the substances burned in Tarascan ceremonies. Tobacco (also known in Spanish by its Nahuatl name *picietl*) was also the most important sacred plant for the premodern Maya and Nahua. Considered the sacred medicine *par excellence,* it was a god in its own right. It was used in various forms, including drunk as an infusion, chewed, smoked in cane tubes or inhaled as dust through the nose. The RM indicates that in the *cazonci*'s funeral procession, one person carried his cane-tubes of fragrances (Craine & Reindorp, 1970: 45), suggesting that he also partook in tobacco smoking. In the Maya and Nahua traditions, ground

tobacco was left in receptacles in temples so that gods could leave their trace to their human followers in the form of an animal print. Also, in meetings of poets and nobles, tobacco was smoked in cane pipes with hallucinogenic plants, granting it both a ritual and a medicinal meaning. Together with copal incense and flowers, tobacco continues to constitute the impalpable nourishment of the divine beings (gods). It also still has an important social meaning in some Nahuatl and Maya communities; in religious and family celebrations cigarettes are offered as gifts, often to older women (de la Garza, 2001: 100-101).

Burning and sacrifice, and their associated smells, also played a role in early Christian society. Here smoke functioned as a transmitter of odour and its qualities, such as the transformation of the stench of burning flesh into the sweet scent of martyrdom, as in the case of Saint Polycarp. The uncontainable and invisible properties of smell enabled odours to cross the boundaries of heaven and earth, thereby offering a link to the divine being (Harvey, 2006: 53-55). The key cross-cultural similarity here is the positive association or perception of the odour that relates to or connects with the deity. We saw in the brief description of the Tarascan war ceremony above that pleasant fragrances in the form of balls of incense and/or tobacco (now called copal) were cast on to the fire to please the god of fire Kurikaweri. A satisfied god brings good fortune to the worshippers, or rather bad fortune to the enemies. By ensuring the support of the gods, then, it could be claimed that pleasant odours therefore played their part in the expansion of the Tarascan State.

5.5. Conclusions

Rather than being difficult to express verbally, as claimed by scholars from various disciplines (see Section 5.1), the domain of smell in Purepecha is actually rather extensive. Odours can be described in three ways: (i) a basic reduplicated root that refers to some kind of PERCEIVED FOULNESS and specific smell morphology in the form of the spatial couplet *-k'u* and *-nti*; (ii) an intransitive root with non-olfactory semantics, such as *kurhi-* 'to burn', combined with the same spatial couplet morphology; and (iii) a generic verb derived from *ja-* 'to be; to smell' with the source of the odour, usually in the objective case, as well as the olfactory spatial couplet. The

presence in the language of basic roots that can refer only to odours (when combined with smell morphology) indicates that Purepecha constitutes another 'olfactory culture'. However, it seems that these basic roots are somewhat underspecified for meaning, as illustrated by the translation in small caps, and receive their manner of perception through the semantically strong, albeit rather opaque in the case of *-k'u* and *-nti,* suffixes. These basic roots have proved to be relatively stable over time, in terms of both form and meaning, suggesting that their origin or introduction into the language considerably predates the earliest existing written records. The reason for the preoccupation in Purepecha for how objects, and more especially body parts, smell, however, remains poorly understood.

It was observed in Section 5.3 how different elicitation methods obtained different types of responses, with the Brief Smell Identification Test™ being the least effective with reference to basic terms. This is likely due to the low cultural salience of the stimuli contained in the booklet, as opposed to the smell jars that contained well-known, local substances. Moreover, the author's presence during data collection may well have influenced participants, consciously or unconsciously encouraging the use of Spanish, the language associated with outsiders. It should also be mentioned that the lower-than-expected use of basic terms attested through the different elicitation methods may also indicate that the system is falling into obsolescence under the influence of bilingualism with Spanish, especially since younger speakers appear to use these terms less (see also O'Meara & Majid, 2016). Nonetheless, the observed propensity for negative hedonic smell terms in Purepecha supports the notion that foul odours are more consciously salient than pleasant ones (Lee, 2010: 115). This notion is not new, however, having been observed by Kant (2006) over 200 years ago:

> "Which organic sense is the most ungrateful and also seems to be the most dispensable? The sense of smell. It does not pay to cultivate it or refine it at all in order to enjoy; for there are more disgusting objects than pleasant ones (especially in crowded places), and even when we come across something fragrant, the pleasure coming from the sense of smell is always fleeting and transient." (Kant, 2006: 50-51).

While cross-cultural comparison of olfactory language may help to highlight certain universal tendencies in naming of typical referents, I contend that olfactory terminology is more valuable when considered from a language- and culture-internal perspective. This is the position put forward by McHugh, whereby the "vocabulary used to describe smells is contingent on a certain time, place and culture", (McHugh, 2012: 65; see also Section 5.4). As the spatial couplet morphology helps us to better understand word formation processes, from both a synchronic and diachronic perspective in Purepecha, so might other elements of olfactory language help in unravelling the many complex puzzles posed by languages across the world.

6. WORD FORMATION AND SEMANTIC TRANSPARENCY IN PUREPECHA

"Right, breaking your leg hurts like hell. HEL, OK? They do it beLOw the knee, 'HEL-LO', get it? They do it twice, twice: 'T(W)O'. HELLO TO. And jigsaw must mean YOU.
HELLO TO YOU!"
(Rimmer to Cat and Lister, 'Thanks for the Memory')

Abstract

In this chapter I investigate the roles and semantic contribution in word formation processes of the two main morphological units in Purepecha: roots and suffixes. Purepecha (isolate, Mexico) is a strongly agglutinating language whose main word formation process is suffixation. Roots can be derived to form nouns, verbs and some minor word classes, but their independent meaning ranges from highly transparent to seriously opaque. Using the 650 fused nouns drawn from Friedrich's (unpublished) Purepecha-English dictionary, I explore the relative semantic status of both roots and suffixes in the language. I discuss the possible classificatory role of the 56 nominalising suffixes identified, focusing on the semantics of the most frequently occurring in order to demonstrate their variability in semantic transparency as well as their possible polyvalence. Through a comparative presentation of nominal classifiers and fused classifier prefixes in four Otomanguean languages, I offer a tentative diachronic pathway for the grammaticalisation of these suffixes in Purepecha. Nonetheless the lexical origin of most of these 'nominalising' suffixes remains somewhat unclear, leaving the way open for a great deal more research into diachronic processes of word formation and the construction of meaning. The opacity of some roots, coupled with their ability to take derivations of multiple word classes suggests an interpretation whereby roots could be considered precategorial rather than verb roots, as has traditionally been the case. Following a discussion of previous analyses, I suggest that these roots could be conceptualised in terms such as √PERCEIVED FOULNESS or √RELATED TO BURNING, rather than as simple translations such as 'to

stink' or 'to burn' in these cases respectively. Such an interpretation would have important consequences for language-internal analysis as well as the production of textual materials, notably dictionaries.

6.1. Introduction

Purepecha (isolate, Mexico) is a strongly agglutinating, mildly polysynthetic language, whose principal word formation process is suffixation. It possesses two main word classes, nouns and verbs, which are differentiated according to the types of suffixes they take following the stem (see Section 1.5.2). In examples (1a-b) the stem is *mi=ta-*, comprising the dependent root *mi-* plus the stem formative morpheme *=ta*, which combine here to give the meaning 'open'. Examples (2a-b) demonstrate an instance of an independent root, here *t'ire-* 'eat', that requires no further morphology before adding word class-specific suffixes.

(1a)	mi=ta-kwa	(1b)	t'u	mi=ta-x-ka=ri
	open=SF-NMZR[140]		2.SG	open=SF-AOR-1/2.S.ASS=2.S
	'key'		'You (sg.) open.'	
(2a)	t'ire-kwa	(2b)	ji	t'ire-a-ka
	eat-NMZR		1.SG	eat-IRR-1/2.S.ASS
	'food'		'I will eat.'	

A dependent root, such as *mi-* in (1a-b), must be accompanied by a stem formative morpheme, after which either nominal or verbal morphology may be added. Chamoreau (2003: 83) offers a clear paradigm of the possible verbal extensions of the root *mi-*, all of which relate to more concrete or more abstract meanings related to 'opening' (3a-e), where the stem formatives are marked in boldface. The inflectional morphemes are identical to those in (1b) and are thus not fully glossed.

[140] As we will see shortly, the label 'nominaliser' (NMZR) is both somewhat misleading and rather vague, but is used here for the sake of simplicity.

(3a)	mi=**ti**-x-ka=ri	'You know'
(3b)	mi=**narhi**-x-ka=ri	'You remember'
(3c)	mi=**na**-x-ka=ri	'You shut away'
(3d)	mi=**ka**-x-ka=ri	'You close'
(3e)	mi=**ta**-x-ka=ri	'You open'

The meaning of all of these stem formatives except one is clear due to their use as suffixes in other categories, even if the semantics of the bipartite stem they form is not necessarily so transparent. In (3a) we find the spatial location suffix *-ti* 'top, upper area' (relating to the top of the face, eyes, and intellectual activity) combined with the root *mi-*, to refer to a state of 'knowing'.[141] Another spatial location suffix appears in (3b), *-narhi* 'principal and flattish area', whose referents include the face, hair, and eyes, and whose combination with a concept of opening can be construed as 'remembering'. As for (3c), the spatial location suffix *-na* 'interior area' offers a composite meaning of 'shut away'. In (3e), the root combines with the causative marker *-ta*, which usually occurs in the fourth slot of the verbal template, although the meaning does not reflect double causation in the sense that it is simply 'to open' rather than 'to make [it] open'. The only so-called stem formative suffix that cannot be defined at this stage is *-ka* (3d), which is also found in the homophonous forms *-ka* '1/2.S.ASS' as well as the standalone lexeme *ka* 'and', although it is unlikely that either of these forms is related to the stem formative.

While the meaning of four of the five stem formative suffixes in (3a-e) is clear, and their compositional meaning when combined with the root is also relatively transparent, we are still left with the further issue of what meaning to assign to the root *mi-*. It is evidently connected to a literal or figurative sense of opening, but the presence of forms also referring to the opposite action - closing - without any clear syntactic markers for reversing the action (assuming that *-ka* does not fulfil that function more broadly in Purepecha morphology) complicates the matter. Moreover, (3c) does not refer to an opening of the chest but a literal or figurative notion of

[141] Note that the spatial location suffixes are translated as nouns but syntactically they are not nominals, rather offering specification of the location of an event or action.

shutting away, again the opposite of opening. The inherent semantic generality of this root makes it difficult, therefore, to assign it a clear independent meaning (see also Adelaar (2005) for a discussion of a similar, although more extreme, case of root underspecification in Muysca, a now extinct Chibchan language of modern-day Colombia). Capistrán Garza (2015: 13) translates *mi-* as '(un)cover', which works in a sense for (3d-e) but the same issues remain when applying such a translation to the more figurative forms. Indeed, while 'referring to opening and closing' may sound clunky, for the time being it is the most accurate translation or representation of its meaning. To label the root *mi-* 'to open' would disallow a reasonable compositional reading of (3c).

In Purepecha, nouns and verbs are differentiated by the suffixes they may take, and indeed it is the suffixes that provide the root with a word class (see also Lucas Hernández, 2014). The verbal template comprises 12 predefined slots following the stem, of which up to six or seven can be filled in any one verb form (Friedrich, 1984). In line with cross-linguistic patterns of affix ordering (e.g. Bybee, 1985; see also Section 2.5), Purepecha stems are immediately followed by six derivational categories, then five inflectional categories, all of which appear in one and only one slot in a strict order. An optional set of subject and object clitics constitutes slot 12. The full list of slots, in order, is as follows: (i) locative, (ii) directional, (iii) causative, (iv) voice/valency, (v) desiderative, (vi) adverbial, (vii) 3.PL.O, (viii) aspect, (ix) tense, (x) irrealis, (xi) mood, (xii) subject/object (see Chapter 1, Table 9). An example including suffixes from categories (i), (ii), (x), (xi) and (xii) can be found in (4).

(4) kwi-parha-pa-a-ka=kini
carry-SP.LOC.long.ext.area-DIR.centrif.-IRR-1/2.S.ASS= 2.SG.O
'I will go carrying you on my back.' (Adapted from Chamoreau, in press)

All verbs are formed according to the 12-place template presented immediately above (although see Section 2.5.1 for a short discussion of alternative templatic orderings). Nouns display more variation, however, when it comes to the suffixes they can take in word formation. The existing literature analyses their internal structure as

comprising a verb root and a nominaliser suffix. Hernández Domínguez (2015: 51), for example, claims that there are three nominalisers, *-kwa*, *-sï* and *-cha,* that he does not differentiate in terms of respective frequency or productivity. We will see presently, as well as in much more detail in Section 4, that this list is much too short. Moreover, the analysis of these suffixes as nominalisers is misleading since nominalisation proper refers to the process of 'turning something into a noun' (Koptjevskaja-Tamm, 2006: 652). Since the element to be 'nominalised' is not a standalone verb (or any other part of speech), the suffixes such as those mentioned by Hernández Domínguez (2015) could be considered to be forming nouns from a precategorial root rather than nominalising a pre-derived lexeme, or word class-specific root (see the discussion for more detail). As such, these suffixes are 'nounifiers' in that they form nouns. However, to avoid inventing new grammatical terminology and to enable comparability across sources and authors, I will retain the term 'nominaliser' here.

I define two types of noun: the first type comprises a stem followed by a productive nominaliser, usually *-kwa* for a wide range of objects and actions of transitive or intransitive verbs (by far the most common nominaliser), or *-ri* for agents. See (5a-b) for an example of each nominaliser combined with the independent root *pire-* 'sing'.

(5a)	pire-kwa	(5b)	pire-ri
	sing-NMZR		sing-AGT.NMZR
	'song'		'singer'

The second type of noun takes the same structure, namely a stem plus a 'nominalising' suffix, but the range of suffixes used is much larger and their semantics are much more opaque. They can be considered synchronically fused forms in which the suffix is a largely unproductive classifying or nominalizing element. As an illustration, take the terms in (6a-b), which are both derived from the root *xïkwa-* 'referring to witchcraft'.

(6a)	xïkwa-pu	(6b)	xïkwa-mi
	witchcraft-NMZR		witchcraft-NMZR
	'spider'		'witch'[142]

While the suffixes *-pu* and *-mi* can only be used to form nouns, some of the suffixes that Chamoreau (2003, 2000) refers to as 'exocentric' can be drafted in to form lexemes from different word classes. Take *-ri*, the suffix introduced above as an agentive nominaliser, as an example. This suffix also occurs in adjectival (7a) and adverbial lexemes (7b), where it is not glossed morphologically since the label 'nominaliser' is evidently not appropriate.

(7a)	tepa=ri	(7b)	incha=ri
	large/heavy/thick=ri		enter=ri
	'fat'		'inside'

Further examples of these suffixes, including an attempt at their semantic categorisation, can be found in Chamoreau (2003: 132-137; 2000: 307-319; see also Foster (1969: 87-89). I will take up the question of their semantic content and weight in Section 6.2, although I will leave a detailed discussion of their polyvalent usage (i.e. in different word classes) for a separate study. It should be noted here already that nouns are typically paid less attention in studies of Purepecha, mainly given the assumption that it is a very 'verby' language (see the overview of root 'verbiness' in Section 6.5.1). Yet nouns clearly contain internal structure that deserves closer attention.

Indeed, the internal structure of nouns (as well as verbs) is not made explicit in the existing Purepecha-Spanish dictionaries (Lathrop, 2007 [1973]; Velásquez-Gallardo, 1978), nor in most other reference works, including examples in grammars and articles. Both of the aforementioned dictionaries list their lexical entries as full words, admittedly as a combination of a root or stem plus one or more suffixes, but

[142] We might, reasonably, expect the agentive noun referring to witchcraft to terminate in *-ri*, as 'singer' in (5b), however its use as an agentive nominaliser is only a strong tendency, not a hard and fast rule.

with no indication as to internal morpheme boundaries. Verbs are generally listed according to the now accepted citation form, which comprises a dependent or independent stem, sometimes plus other suffixes (e.g. voice and/or mood) and the non-finite terminating suffix *-ni*. However, the use of the non-finite suffix is nothing more than a linguistic convention, likely based on the Spanish infinitive model, and does not allow the reader to analyse the individual components of a word, nor their combinatorial semantics. Examples of non-explicit dictionary entries for both a noun and a verb can be observed in (8a) and (8b) respectively. Note that the first line of the example provides the original entry in Velásquez-Gallardo's (1978) dictionary, the second line represents the orthography used in this chapter with morpheme boundaries added, the third is the gloss of the second, while the last is a translation to English of the meaning as given in the dictionary.

(8a)	*kuatás, kuatáshi*[143]	(8b)	*kuatárani*
	kwata=sï		kwata=ra-ni
	kwata=NMZR[144]		kwata=SF-NF
	'tortilla basket, *tazcal*[145]'		'to tire'

By deconstructing each term on a morpheme-by-morpheme basis, it is possible to better understand the relative contribution of each component and how they combine to form a more or less semantically transparent whole. In (8a-b), for example, it proves very difficult to assign concrete meaning to the root *kwata-* given the semantic distance of the two derived terms.

Only Friedrich's (unpublished) dictionary, part of which appears in the appendices of the now out-of-print Friedrich (1971), lists entries by root, followed by possible combining suffixes, thereby enabling the reader to comprehend the internal

[143] Note that multiple spellings exist for the word-final sound [ʃ], including <s>, <sh>, <shi>, <sï>.
[144] The root *kwata-* is not translated as its semantics are difficult to recover on the basis of the lexemes it forms with the addition of the different suffixes. A translation without the addition of a stem formative is also absent from Friedrich's (unpublished) dictionary. I return to this issue of semantic specification in Section 6.2.
[145] The term *tazcal* may have entered Spanish from the Classical Nahuatl *tlaxcalchiquihuitl* 'basket for keeping corn tortillas' (Real Académia Española, http://dle.rae.es/?id=ZGgHbcP).

structure of the word. Yet a closer reading of the internal structure of a Purepecha noun or verb highlights a key issue that I will explore in this paper, namely the relative semantic transparency of both roots and suffixes in the formation of stems and full words, and how much independent meaning both carry. In other words, I seek answers to the question of what the semantic load of roots is, and to what extent are they defined by their accompanying suffixes. More generally I explore what the semantic relationship is between the two elements using a database of nouns (Friedrich, unpublished), a generally under-examined word class in Purepecha.

The rest of this paper is structured as follows. In Section 6.2 I explore the role of suffixes in deriving nouns using a database of around 650 lexemes extracted from Friedrich's (unpublished) Purepecha-English root dictionary. By comparing their relative semantics, I offer a more finely tuned classification for a sub-set of these suffixes (cf. Chamoreau, 2003, 2000). Section 6.3 draws parallels between the classificatory nature of the nominal suffixes in Purepecha and the nominal affixes in Ocuilteco and other, related, Otomanguean languages of Mesoamerica, offering a possible parallel grammaticalization pathway. In Section 6.4 I use data from Friedrich (unpublished) and my own fieldwork data to demonstrate that roots display variable amounts of semantic transparency but nonetheless many would be better represented as more general concepts rather than specific words in either Spanish (the most common metalanguage for translating from Purepecha) or English. I contrast this new proposal with a critical overview of existing accounts of root semantics and word formation in Purepecha in Section 6.5, together with a more detailed discussion of the notion of precategoriality. I offer some concluding remarks in Section 6.6, as well as a number of suggestions for future research.

6.2. The role of suffixes in noun formation

As indicated in Section 6.1, we can identify two main types of noun in Purepecha: (i) synchronically simplex (i.e. lexicalised) nouns that have been derived with a now non-productive, and sometimes semantically opaque suffix, and (ii) synchronically derived (i.e. less lexicalised) nouns, namely those ending in *-kwa* 'nominaliser' and *-ri* 'agent nominaliser' (see examples (5) and (6)). Friedrich (1984: 74) adds nouns in

-ti, also an agentive nominaliser, to this second type, although does not provide any supporting examples.[146] Since the function and semantics of the suffixes in the second noun type are mostly clear, I will focus here on the first type, namely synchronically simplex nouns that are clearly historically complex, containing a root and additional nominalising suffix. It is the semantics of these apparent nominalising suffixes that require further investigation.

Chamoreau (2003, 2000) identifies 23 'exocentric derivational suffixes', that is suffixes appearing at the end of a lexeme which "most frequently serve to indicate the word class of the word thus formed" (Chamoreau, 2000: 307, my translation). Indeed all of these suffixes form nouns, but some can form words of multiple classes, such as adverbs or numerals.[147] I will only make reference to other word classes when the distribution of a particular suffix necessitates it. The nouns in (9) are indicative examples of the root plus synchronically fused suffix type of noun, where the diachronic suffix is indicated as a clitic for clarity.[148]

(9)	kuru=cha	'fish'
	porhe=chi	'pot'
	wi=chu	'dog'
	nana=ka	'young girl'
	atsï=mu	'mud'
	kawi=mxï	'drunkard'
	awa=nta	'sky'
	tsï=nti	'widow'
	kw'iri=pu	'person'
	ire=ta	'town, community'

[146] Friedrich (1984: 74) also states that the agentive nominalisers *-ri* and *-ti* are related to the 'concurrent participles' *-rin(i)* and *-tin(i)* respectively. Chamoreau (in press) analyses these as an agent-oriented present participle (*-rini*) and an active past participle (*-tini*) but suggests no link to the nominalising suffixes.

[147] Foster (1969: 40) argues, however, that numerals are either a sub-class of substantives, or nominals, or one of the seven verbal stem classes (Foster, 1969: 170).

[148] It is fair to assume that the nominalising or classifying suffixes are indeed suffixes rather than part of a di- or trisyllabic noun root based on the stress pattern of the lexemes, where stress falls on the first or second syllable, namely within the root.

Many of these terms are based on roots that can take other nominalising suffixes, sometimes with closely related, or at least comprehensibly linked, meanings as in (10a), other times with semantically very distant meanings (10b). As is clear in these two examples, the root can also be difficult to define, since the meanings derivable from the root can vary quite considerably (see notably (10b)).

(10a)	*ire=ta*	'town, community'
	ire=cha	'king, leader'
	√ire-	'related to living' (cf. also *ire-ka-ni* 'to live, dwell')

(10b)	*kuru=ta*	'foam'
	kuru=cha	'fish'
	kuru=ku	'turkey'
	√kuru-	'?' (cf. also *kuru-nha-ku-ni* 'to pull or scrape from centre of pot')

In both (8a) and (8b), the suffixes *-ta* and *-cha* attach to the root to form fused nouns, although ostensibly their shared semantic contribution is hard to identify. One of the causative markers in Purepecha is also *-ta* yet the nouns in (8a-b) do not seem to have any kind of valency increasing semantics, in contrast to the verbal example provided in (1a-b), nor even any kind of implied agency. Equally, *-cha* refers to an animate entity in both cases, but two very different types of animate. As such, its meaning as 'male' (Chamoreau, 2003: 132) seems to be something of a stretch.[149]

Nonetheless, the variability of meanings present, notably in example (8b), suggest more significant semantic input from the large number of suffixes observable in these synchronically fused nouns, as a means of providing more fine-grained definition to the seemingly underspecified root. However we have already seen, and will see later in more detail, that this account is still somewhat problematic, since the

[149] The other nouns provided by Chamoreau (2000: 307-308) as evidence for the meaning of *-cha* as 'male' are *tempucha* 'husband' and *warhicha* 'spirit that causes death'. The two male human referents seem to support an analysis of *-cha* as a marker of male animate, but I still find the other terms as very weak support for an argument that is only based on two terms.

meaning of the respective nominalising suffixes can also be rather opaque. In his sketch of sixteenth-century Purepecha grammar, Swadesh (1969: 51) presents almost 40 "nominal suffixes", all of which overlap with the 23 identified by Chamoreau (2003, 2000). A combined list of these suffixes, as well as their proposed semantics or classificatory function, with the source included in brackets, either (CC) for Chamoreau (2003) or (MS) for Swadesh (1969) can be found in Table 24. Where a semicolon separates two suffixes in the first column, the first entry is from Chamoreau and the second from Swadesh. A forward slash indicates alternative spellings for the same suffix, according to Chamoreau.

Suffix	**Referents**
-cha	Masculine sex (CC); thing, animal, substance (MS)
-chi; -che	Thing, animal, substance (MS)
-chu	Thing, animal, substance (MS)
-ka	Younger or smaller state (CC); nominal (MS)
-ki-/k'i	Mostly animals (CC); nominal (MS)
-ku	Nominal (MS)
-kwa	Things, foods, bodily organs, people, concepts (CC); condition, action, instrument (MS)
-kwe	Friend, relative (MS)
-ma	Thing (MS)
-mi	Thing (MS)
-mu	Thing, numeral (MS)
-na	Nominal (MS)
-ni	Nominal, time (with numerals) (MS)
-Npa[150]; -m-ba[151]	Thing (MS)
-m-bi	Thing (MS)
-m-bu	Thing (MS)
-Nxï	Quality of a person

[150] Chamoreau (2000: 36) uses the "archiphoneme" /N/ to represent both /m/ and /n/ in preconsonantal position, since the phonological opposition is lost in this environment. However, I will continue to differentiate between the two phonemes orthographically, e.g. *-mpa* and *-nta*, for ease of reading.

[151] Swadesh (1969) does not indicate why he inserts a dash between the initial nasal and the subsequent voiced stop but it is possible, especially given the predominating CV syllable structure, that the 'prenasalised' suffixes may represent the outcome of a formerly disyllabic suffix or pair of suffixes, where a mid or high vowel has been lost. I explore the structure of the set of suffixes in Table 5 in more depth in Section 6.2.1.

-Nta; n-da	Thing (MS)
-Nti; n-di	Thing (MS)
-n-du	Thing (MS)
-nu	Nominal
-pa	Thing (MS)
-pi	Thing (MS)
-pu	Thing, plant (MS)
-p'a	Only in *wap'a* 'child'
-ra	Thing (MS)
-ri	Profession or activity of person (CC); thing (MS)
-ru	Thing (MS)
-rha	Nominal (MS)
-rhi	? (Homonym of SP.LOC 'whole body')
-si/-sï/-shï	Animals, humans, body parts, food
-ta	Thing, material, nominal (MS)
-ti	Mostly human beings or animates (CC); thing, material, nominal, agentive (MS)
-tu	Thing, material, nominal (MS)
-tsi/-tse/-tsï	Animals mostly (CC); thing, animal, substance (MS)

Table 24: Nominalising suffixes in Purepecha and their proposed semantics

Even though she proposes some semantic, and in all cases word class, categories for the suffixes listed in Table 24 (as indicated in the second column), Chamoreau (2003: 132) claims that it is rare for these suffixes to offer additional meaning. Yet despite the prevalence of the vague referent 'thing' for many of the suffixes, Swadesh's (1969) categorisation also suggests that these suffixes offer more than simply word class information to the root, and it is to this issue that I now turn.

6.2.1 Semantics of nominalising suffixes

In order to investigate the semantics of the synchronically fused suffixes with apparent nominalising function more systematically, I compiled a list of such nouns from Friedrich's (unpublished) *Dictionary of Tarascan Words, Idioms, and Expressions*. I discovered this 100-page Purepecha-English dictionary in the Paul Friedrich Papers 1945-1999, held at the University of Chicago Library Special Collections. To my

knowledge it is the only complete Purepecha-English dictionary in existence. Parts of it were published as an appendix to Friedrich (1971), but this work is now out of print. In contrast to the format of the two main lexicographic sources for Purepecha (both to Spanish), namely Velásquez Gallardo (1978) and Lathrop (2007), the principal entries in Friedrich's dictionary are roots rather than infinitives or conjugated verbs. Following each root is a list of suffixes and suffix combinations that can be added to the root in order to derive other verbs, or nouns, together with their meanings. The synchronically fused nouns that form the focus of this chapter are generally listed as separate entries in the work, rather than as a root plus suffix, underlining their status as synchronically fused elements. I collected all instances of fused nouns listed in this work, totalling just over 650, classifying them by semantic field following the World Loanword Database categories (see Haspelmath & Tadmor, 2009). By using a broad sample of lexical items across different semantic domains, I aim to avoid generalising on the basis of sporadic cases and thus be able to draw more insightful conclusions regarding the synchronic and diachronic function of these nominalising suffixes (see Evans & Osada, 2010: 366).

Taking into account a certain amount of orthographic inconsistency, I identified a total of 54 nominal suffixes in the Friedrich dictionary from 679 fused nouns, almost twenty more than those listed in Chamoreau (2000) or Swadesh (1969), as already presented in Table 24. However, 29 of these suffixes occur fewer than five times in the corpus, therefore I have chosen to exclude them from further discussion. The remaining 25 suffixes, together with their respective frequencies, are presented in Table 25.

Suffix	Frequency
ku	129
n(i)	64
ta	64
śʌ/sʌ/śĭ/si/sĭ/śi/shi	54
ri	56
mu	30
pu	27
nta	27
ki/jki	24
tsĭ/tsi	26
ti	21
nku/Nku	11
mpa	9
Ri/rhi	8
sku	8
chu	7
ra	7
ru	7
cha	6
chi	6
mi	6
ka	5
nti	5
shu	5

Table 25: Frequency of 25 most common nominalising suffixes in Friedrich (unpublished)

The reason for the high frequency of *-ku* (n = 129) in Table 25 is that it is the standard object nominaliser (in place of *-kwa*) in the villages where Friedrich conducted most of his fieldwork, namely Cocucho and San José in the *Sierra* or *Meseta Purepecha* (see Section 1.2). As I am interested in the fused suffixes rather than the commonly productive *-kwa/-ku*, I will also not consider the forms in *-ku* in the discussion of the possible provenance and meaning of some of the suffixes that follows.

Three of the suffixes in Table 25 are homophonous with the case marking suffixes *-ni* OBJ,[152] *-rhu* LOC (sometimes also represented orthographically as *-Ru* or *-ru*), and *-nkuni* COM (see Section 1.5.2). Take, for example, *-rhu*, which can be found with nominal locative case function (11a), in place names, in the fossilised form *-ro* (11b), as well as in synchronically fused nouns (11c).

(11a) ana-t'a-ta-s-ti tsintsikata-**rhu**
be.vertical-SP.LOC.vertical-CAUS-AOR-3.S.ASS wall-**LOC**
'He placed him upright near the wall.' (Adapted from Chamoreau, in press)

(11b) Purepe**ro** 'place of the Porhe' < *p'or(h)e-* 'Purepecha' + *-pi* ANTIP + *-rhu* LOC
Turícua**ro** 'dark place' < *tur(h)i-* 'black, dark' + *-kwa* NMZR + *-rhu* LOC
Etucua**ro** 'place of salt' < *etu-* 'salt' + *-kwa* NMZR + *-rhu* LOC

(11c)	ekwa-**rhu**	itsa-**rhu**	shanga-**rhu**
	pile.up-**LOC**	water-**LOC**	walk-**LOC**
	'patio'	'any water source, waterhole'	'road'

All three of the nouns in (11c) relate, unsurprisingly, to a location in the physical world: a patio is a place where one can pile up firewood, a waterhole is a place where water can be fetched, and a road is a place where one can walk. The nouns in *-ru* proper, on the other hand, refer to a wider variety of referents, examples of which can be observed in (12).[153]

[152] The suffix *-ni* is also the non-finite marker in the verbal domain. Due to the complexity inherent in differentiating between homophonous or identical suffixes with the form *-ni*, I shall not treat them in this paper, choosing instead to concentrate on the more diachronically transparent examples.
[153] Neither Chamoreau (2003, 2000) nor Swadesh (1969) separate *-ru* from *-rhu* in their treatment of nominalising suffixes, in contrast to Friedrich (unpublished).

(12)	kampe-**ru**[154]	pite-**ru**	tuku-**ru**
	'a sierra flower, various colours'	'player of native flute'	'owl'

As the examples in (12) demonstrate, the semantics of the suffix are not always so transparent; this contrast is especially prominent when comparing these examples with those in (9c). Swadesh (1969: 51) assigns the rather vague category of 'thing' to nouns in *-ru*. This is understandable insofar as there seems to be no semantic or formal characteristic that connects the three referents: a flower, a human agent and an animal. Moreover, in these cases it is difficult to consider the respective semantic contribution of the suffix vis-à-vis the root, since no separate entry (or, indeed separate meaning) for the three roots - *kampe-*, *pite-* and *tuku-*, can be found in Friedrich (unpublished) or elsewhere. Their status as diachronically fused nouns can be defended by the fact that the stress falls on the second syllable of the root, hence forming the natural boundary with subsequent derivational morphology.

Let us turn now to the comitative suffix *-n(h)kuni*, which displays much less transparent semantics where it appears in fused nouns as *-n(h)ku*.[155] This case marker has a clear origin in the postposition *jinhkun(i)* 'with', which has been reduced both phonetically and structurally to the suffix *-n(h)kuni* in modern Purepecha. The related nominalising suffix *-n(h)ku* is found in 11 fused nouns in the Friedrich corpus although, as the selected examples in (13) demonstrate, their relation to a comitative reading is extremely hard to identify. I have indicated possible roots or related terms after each entry, where appropriate, but the overwhelming impression from these terms is that there is little to unite them as far as the suffix *-nhku* is concerned.

[154] Friedrich (unpublished) notes that this term may be a loan from Spanish, but I can find no evidence for this being the case.

[155] The bracketed (h) indicates that the comitative suffix and nominalising suffix is spelled with both a simple alveolar nasal <n> in some instances and with the velar nasal [ŋ], rendered orthographically as <nh>, in others.

(13)

isi=nku, si=nku	'armadillo'
she=nku	'cherry (tree or fruit)' < *she-* 'to see' (very doubtful)
tu=n(h)ku	'a paralytic (San José)' < *tu-* 'to roll up or over'
tse=n(h)ku	'an edible worm (San José)', likely related to *tsemukwa* 'taste'
ts'e=nku	'a white cocoon, 2" to 4" in diameter, where butterflies develop (San José)' < *ts'e-* 'to test, try out'

Of course, not all of the nominalising suffixes presented in Table 25 also function as case markers. Some are homonymous with spatial location and/or voice suffixes and, as a set, they also constitute additional examples of more and less transparent classifying or nominalising elements on synchronically fused nouns. Let us begin at the more transparent end of the continuum: Table 26 presents the fused nouns in Friedrich (unpublished) terminating in *-mu*. Note that orthography has been regularised and the suffix indicated as a clitic for clarity.

Lexeme	Meaning	Semantic domain (WOLD)
jarhu=mu	a sierra tree, used for brooms	plants
ku=mu	mole	animals
kupa=mu	goad for driving beasts of burden	animals
kutsu=mu	a bush with white flowers (*acetilla*)	plants
kwi=mu	six (cardinal)	numeral
k'wera=mu	thin kindling of dry, pitchy pine	plants
orhe=mu	a sierra tree, with bird fruit, quite large, branches used for packing pottery	plants
urhe=mu	a sierra tree, with bird fruit, quite large, branches used for packing pottery (SJ)	plants
pa=mu	a fairly tall sierra tree, very porous wood, grows among pines	plants
parha=mu	ash tree	plants
pi=mu	palm of the *tierra caliente*	plants
piri=mu	a tree with long very thin truck, a switch of any kind	plants
p'ata=mu	the *carrizo* reed	plants
p'atsi=mu	the *tule* reed	plants
shïncha=mu	a variety of oak in the high sierra, leaves long and wide, grows very tall, valuable wood	plants
shu=mu	mist, fog	physical world
tani=mu	three	numeral
tarhi=mu	a large, willow-like tree	plants
tia=mu	iron, steel	technology
tini=mu	scale (of fish)	animals
t'a=mu	four	numeral
t'pa=mu	tall tree with white flowers	plants
tsurhu=mu	thorn of any fruit or plant	plants
ts'iri=mu	Mexican linden, white wood excellent for guitars, flowers used medicinally ("*flor de tilia*")	plants
wanu=mu	a fairly tall tree with long pods, smooth bark, similar to the *arumba* (SJ)	plants
winu=mu	pine needle	plants
wira=mu	flat stone, as for paving	physical world

Table 26: Fused nouns in *-mu*

Swadesh (1969: 51) claims that nouns in *-mu* refer to things or numerals. Similarly, Chamoreau (2003: 135) notes that *-mu* appears in the numerals *tanimu* 'three', *t'amu* 'four', and *yumu* 'five', none of whose roots (i.e. *tani-*, *t'a-* and *yu-*) can be attributed any independent meaning. The suffix also occurs in the adverb *támu* 'separately' (from *tá* 'separate'), which also has a quantificational-like reading not too distant from the numerals. She also observes that *-mu* is homonymous with the spatial locative suffix that refers to the oral zone or an opening more generally (Chamoreau, 2000: 314). This seems like little more than a passing observation since there is no evidence in Table 26, for example, that the nouns are related to openings or the mouth. Indeed, aside from the three numerals, the fused nouns in *-mu* display a preference for the semantic domain of plants (18/27, or 67%). Yet there is no discernible source for the suffix *-mu* in the lexicon of plants and vegetation, where one might expect to find a generic or prototypical exemplar as the origin of such a classificatory suffix (see, e.g., Pache, 2016 on the grammaticalisation of plant part terms in Chibchan languages). Its prevalence in plant-related terms in modern Purepecha therefore remains difficult to explain.

Let us turn now to a suffix with a less obvious semantic classification, namely *-pu*, which is attested 27 times in the Friedrich (unpublished) corpus, of which 20 instances constitute only the root and this suffix, as listed in Table 27.

Lexeme	Meaning	Semantic domain
antsa=pu	shoots growing, hanging down	plants
ku=pu	gnat	animals
kwere=pu	a small fish (Pátzcuaro)	animals
kwina=pu	a variety of hawk, grey, very aggressive	animals
k'wera=pu	scorpion	animals
k'wipi=pu	wild dove	animals
k'wi=pu	honeycomb	food and drink
k'wiri=pu	person	human body
mist-papu	wildcat	animals
oche=pu	a small *tamal* of fresh field corn	food and drink
sina=pu	obsidian	physical world
sutu=pu	sack or bag	household/technology
shïki=pu	shavings (of wood), outer shell, husk, chaff (of grains)	plants
shïkwa=pu	spider, spider web	animals
tima=pu	bowl of dry gourd (Cocucho)	household/technology
tu=pu	belly button	human body
tsaka=pu	stone	physical world
ts'ki=pu	the stone of any fruit	plants
wawa=pu	bee	animals
wirhi=pu	cradle (usually a small wooden box); small, oblong box for making adobe	household/technology

Table 27: Fused nouns in *-pu*

It is clear from Table 27 that the type of referents covered by *-pu* are more varied than those of *-mu*, with the most common set - animals - comprising less than half of observed tokens (8/20), but considerably more than each of the other six minor attested domains: household / technology (3/20), plants (3/20), food and drink (2/20), human body (2/20), and the physical world (2/20). In contrast to commonly attested numeral or nominal classifier systems, classification on the basis of size, shape or animacy is also not forthcoming, not even one comprising, or analogous to, the three-way distinction relating to round, flat and long objects previously present in Purepecha (see, e.g., Chamoreau, 2013; see also Section 1.5.2). Thus, while there seems to be a

preference for animal terms in *-pu*, it is not possible to claim unequivocally that it is a marker or classifier for animals.

Yet it should be underlined that *-pu* and *-mu* are clearly contributing to the overall meaning of the noun, as the contrasts in (14) demonstrate.

(14)	*ku=mu*	'mole'	*k'wera=mu*	'thin kindling'
	ku=pu	'gnat'	*k'wera=pu*	'scorpion'

The root *ku-* is translated by Friedrich (unpublished) as 'to meet, encounter' but such a translation does not fit with the meanings presented in (14). No definition is offered for *k'wera-*. Yet the semantic opacity of the root is not counterbalanced by semantic transparency on the part of the suffix, since even the rough classification of *-mu* as plant and *-pu* as animal is also insufficient to give the accurate readings of the terms.[156] A similar situation can be observed in (15) with the root *kwi-* 'carry; be seated' (note that it has two entries in Friedrich's dictionary), which does not seem to contribute meaningfully to the nouns derived from it.

(15)	*kwi=mu*	'six'
	kwi=ni	'bird; penis'
	kwi-tsï	'tadpole'

All three of the suffixes presented in (15) also occur as suffixes of locative space, namely *-mu* 'orifice and orifice-edge area', *-ni* (also *-na*) 'interior area' and *-tsï* 'top area'. Yet the semantics of the fused nouns that take these suffixes, not to mention the suffixes themselves (where a separate meaning can be identified), and the semantics of the locative space suffixes show a remarkable lack of overlap. The same can be said for *-nta*, found both as a classifying suffix in 21 fused nouns and as the spatial locative referring to 'around the side of something' (see also Chamoreau, in press). The fused nouns in *-nta* are listed in Table 28.

[156] Equally problematic is the pair *kupa=mu* 'goad for driving beasts of burden' (see Table 29) and *kupa=nta* 'avocado', where *kupa-* has no clear root meaning. Such instances are frequent in Purepecha therefore I will not list them all here.

Lexeme	Meaning	Semantic domain
awa=nta	sky	physical world
eme=nta	the rainy season	physical world
japu=nta	lake, pond	physical world
ka=nta	side	technology
kwiiu=nta	strip of leather for typing yoke to cow's head	animals
kupa=nta	avocado	food and drink
kurhi=nta	bread	food and drink
kutsa=nta	strong storm with rain and wind	physical world
k'ere=nta	filth, body dirt; mountain peak, cliff or steep rocky slope	physical world
k'uma=nta	shadow	human body
k'urhu=nta	tamal	food and drink
papa=nta	goats bells (San Jose), a ball of old clothes about 4" wide, for playing	animals; household
pira=nta	"balls" (archaic, San Jose)	human body
sunu=nta	wool	plants
shunha=nta	pitch, sap, the running sap of conifers	plants
shïra=nta	paper	physical world
shïru=nta	soot	physical world
tama=nta	an old log or tree	plants
tiri=nta	low hued or dull yellow, yellow-reddish earth	physical world
t'unu=nta	trunk of tree	plants
tsumi=nta	corner (on the outside, over 180 degrees)	spatial relations
urhu=nta	a sierra grass used for making hair brushes and brooms	plants

Table 28: Fused nouns in *-nta*

The fused nouns in *-nta* also are not coherent in terms of the semantic domain they represent: 8/22 (around one-third) belong to the domain of the physical world, five to plants, three to food and drink, two to human body, two to animals (one of which can also refer to a household item), and one each to technology and spatial relations. This distribution suggests a minor preference for objects or occurrences in the physical world, and an even more minor one for plants and plant-related terms, but more clearly indicates that the referents are varied.

An example of a set of nouns differentiated in terms of their suffix only is presented in (16).

(16)	k'ere=mi	'surface of water'
	k'ere=nta	'mountain peak, cliff or steep rocky slope'
	k'ere=ri	'board'
	k'ere=sku	'wing' (Cocucho)
	k'ere-k'ere-p'-jasï	'very dirty'

In terms of the semantics of the nominalising suffixes, the aforementioned *-nta* once again relates to the physical world, albeit in a not hugely specific manner (see Table 31). The suffix *-mi*, also found as the suffix of locative space referring to 'open area with liquid' (Chamoreau, in press) here also has a water-related meaning, suggesting a connection or common origin for the suffixes, unlike the other spatial locative suffixes addressed above. The suffix *-ri* also occurs as a second person singular person-marking clitic on verbs and as the reduced form *-eri* to mark genitive case, although these functions seem separate from the nominalising function observable here. Finally, the suffix *-sku* is not attested anywhere else in the grammar. While the root *k'ere-* is attributed no separate meaning in Friedrich (unpublished), on the basis of the nouns in (14) we might wish to suggest a meaning relating to a flat surface, either horizontal (e.g. board) or inclined (e.g. slope). The suffixes then provide greater specificity to the nature of this surface.

To sum up, the examples presented in this section, though they only represent a sub-set of all existing nominalising suffixes, demonstrate two main points. First, formal parallels exist between different parts of the nominal system, namely between case markers and nominalising suffixes, and spatial locatives and nominalising suffixes. However, the semantic link between the two ranges between clear (e.g. *-rhu*) and non-existent (e.g. *-nta*). As such, it is probably also not worth ruling out a situation where two (or more) homophonous suffixes with different meanings exist in the grammar. Second, the meaning of a term (here, a noun) ranges from explicit in terms of the semantics of both the root and suffix, the semantics of the root only, or not

really from either (cf. Friedrich, 1984). I will discuss the implications of these findings, as well as a typological parallel in Mesoamerica, in the next section.

6.3. Grammaticalising nouns: A Comparison with Otomanguean

We have observed thusfar that the relative semantic contribution of the root and suffix to the full noun is unclear in many cases and in some cases neither is really definable, thus rendering their meaning and relative semantic contributions opaque. Where the semantics of the suffix are more transparent, we can observe a certain amount of polyvalency, that is the same suffix appears in different functions and, in some cases, also forms lexemes of different word classes. It is likely that in some cases homophonous suffixes exist, for example between the nominalisers/classifiers and the locative space suffixes, since the semantics of the nominalising morpheme and the spatial locative seem unconnected. This observable variation in semantic and formal transparency begs the question: what are these nominalising suffixes, formally and functionally speaking, and what are their origins?

The synchronically fused nominalising suffixes presented in Section 6.2.1 can be divided into two types: (i) those with a clear parallel or origin elsewhere in Purepecha morphosyntax, such as *-rhu*, the locative case marker and nominaliser for location, and (ii) those lacking a parallel or origin elsewhere in the grammar, such as *-nti*, even if a homophonous suffix (for example, of locative space) with a different function also exists. The first type can be accounted for by well-established processes of grammaticalization whereby a noun class marker can be the result of a reinterpretation of a case or number pattern, or of a locative expression (see, e.g., Kilarski, 2013). The second type, however, is strongly reminiscent of the 'class term' type of nominal classifier, defined as "classifying morphemes which participate in the lexico-genesis of a language" Grinevald (2000: 59). Such an analysis is bolstered by examples such as *-mu*, which largely refers to plants (see Section 6.2.1), the most common semantic domain of class terms. However, while this seems like a neat account of the set of suffixes, it does not fully stand up to closer scrutiny. Grinevald (2000: 59) continues her presentation of 'class terms' by stating that they have a clear

lexical origin, such as *-berry* in the English terms *strawberry, raspberry, gooseberry,* etc. The issue we immediately confront is that the lexical origin of most of the fused noun suffixes in Purepecha cannot be identified, even where a semantic preference is identifiable for a given morpheme, such as plants or the physical world. Yet the nominalising suffixes are still functioning in a class term type fashion, insofar as they play a key role in the formation of nouns, sometimes offering these more specific semantics. In order to better understand the diachronic developments leading to this synchronic situation, it is instructive at this point to shift our attention to similar systems of nominal classifier morphemes that exist, in varying states of synchronic fusion, in a number of Otomanguean languages (see also Suárez, 1983: 89).

Many nouns in Ocuilteco (Matlatzincan, spoken in State of Mexico, bordering Michoacán to the east) contain a prefix analysable as a frozen classifier morpheme that has become fused to the root, but whose semantics can be hard to determine (see Muntzel, 1998, 1986). The morphological segmentation of fused nouns can be difficult but the following classifiers, together with their (rough) semantics, have been identified: *ni-* 'generic classifier', *nu-*, 'above, up', *ši-* 'covering, surface, skin', *we-/be-* 'kinship, human roles', as in (17), where they are marked in bold.[157]

(17) **ni-**phi 'foam' **we-**ntu 'man'
ši-tu 'hair' **be-**pe 'thief' (Muntzel, 1986: 73-76)

In addition to these fused, and semantically bleached, classificatory prefixes, Ocuilteco has lost a further series of affixes with a clear nominal classificatory function. These lost affixes (also referred to as 'formatives' by Muntzel (1986: 78)), survive in Ocuilteco's closest relative, Matlatzinca (Matlatzincan), where they are also fossilised. The following affixes have been attested, some with clear semantics: *in-*, *te-*, *-ni*, *-wi*, *-bi*, *-ri*; *xi-* 'covering, sharp', *si-* 'hair, fibre', *sa-* 'tree', *chho-* 'mushroom', *chhú-* 'sacred', and *chi-* 'liquid' (Muntzel, 1986: 78; Cazes, 1971: 204).

[157] A number of others also exist, but their semantics are less clear thus they are not included here. See Muntzel (1998, 1986) for more details.

The presence (in Matlatzinca) and absence (in Ocuilteco) of these classificatory affixes can be observed in (18).

(18)	**Matlatzinca**	**Ocuilteco**		
	čʔi-**ni**	čʔi	'snake'	
	in-no-**wi**	noo	'comal' (clay griddle)	
	hme-**wi**	hme	'tortilla'	(Muntzel, 1986: 78)

While it may be tempting to analyse *-wi* in Matlatzinca as a classifier for flat objects, the two-dimensional shape *par excellence* in languages with nominal (or numeral) classifier systems (e.g. Bisang, 2002), its occurrence with other nouns as diverse as 'water', 'armadillo' and 'blood' disallows such an analysis. Such semantic variation in referents with the same classificatory affix, and the associated difficulties with assigning meaning to either root or suffix, closely resembles the situation found in Purepecha.

San Juan Chiquihuitlán Mazatec (Mazatecan, spoken in Oaxaca) displays a relatively transparent set of classifying elements, whose grammaticalization varies. Many simple nouns begin with *na-*, such as *natsë* 'fly', *nachjun* 'thread' and *najña* 'corncob', which probably functioned as a nominaliser, or general classifier, during earlier stages of the language but has since become completely semantically bleached and morphologically fused to the original noun root. This prefix may be related to the fused generic classifier prefix *ni-/nu-* found in Ocuilteco. In contrast, animals are generally preceded by the pronoun *chu* 'he (animal)', as in ***chu*** *naña* 'dog', while plant names can be preceded by the word *naxu* 'flower', *ya* 'stick' or *xca* 'leaf', exemplified by ***naxu*** *nanchi* 'orchid', ***ya*** *laxo* 'orange tree' and ***xca*** *yuma* 'avocado leaf' (see VandenHoek de Jamieson, 1988: 30-34). This type of classification is more representative of the early stages of grammaticalization of a classifier system, whereby a full lexical item - usually the prototype of a given class - serves as the marker of all nouns of that category.

The system found in Metzontla Popoloca (Popolocan, spoken in Puebla state), on the other hand, displays typical characteristics of a vital synchronic nominal

classifier system and thus one whose classificatory affixes provide clear, systematic semantics to a root. The majority of complex nouns in Metzontla Popoloca are formed from a classificatory component (of which there are 16) and a classified component such as ***nrí-***čą́xà ‘girl’ or ***šù-***čeʔ ‘metate’ (grinding stone; Veerman-Leichsenring, 1991: 335). The classifier also constitutes an independent lexeme, usually the prototypical referent of a certain category, such as *nrí* ‘girl, young woman’ or *šù-* ‘stone’. Sets of roots plus classifiers can be identified, whereby the classifier provides the semantic specificity for a given noun, as in (19).

(19) **ndà-** šéyā ‘custard apple tree’
tù- šéyā ‘custard apple’
sù- šéyā ‘custard apple tree flower’
kà- šéyā ‘custard apple tree leaf’
(Veerman-Leichsenring, 1991: 339)

Of particular note when considering these systems from a comparative perspective is that the classified component (i.e. the noun root) lacks independent semantics and, as such, cannot always be used separately, unlike the classifying element (see above). The roots in (20), √šéyā and √čápì, cannot be translated on their own, a situation we also observed earlier for some Purepecha roots (and suffixes).

(20)

ndà-šéyā	kū-čápì
CLF.tree-šéyā	CLF.animal-čápì
‘custard apple tree’	‘mockingbird’

(Veerman-Leichsenring, 1991: 339)

The Otomanguean languages presented here offer a possible parallel for the diachronic development of the nominalising suffixes in Purepecha, whereby a semantically transparent classifier (which itself was previously an independent lexeme), such as *-mu* for plants, is gradually reanalysed as a marker of nounhood with increasingly weak ‘planty’ semantics, eventually losing any reference to the previous

semantic domain of which it formed part. The obvious drawback in the case of Purepecha is that the origin of many of the suffixes remains unclear which, coupled with a lack of historical attestation prior to the late sixteenth century, leaving the proposed development trajectory somewhat speculative. Even where the suffixes enable semantic oppositions between pairs or multiples of lexemes from the same root to be constructed, their semantics are still not transparent beyond a preference or tendency (see Section 6.2.1), unlike the case of Popoloca.

The complexity inherent in assigning semantics to what I have generally been referring to as nominalising suffixes can also be observed on word types. We saw in Section 6.2.1 that *-mu* appears on fused nouns, numerals and as a spatial locative for the orifice and orifice-edge area. In this vein, let us take the demonstratives *i-nti* 'this (not so close)' and *i-sï* 'this, this way, like this' from the root *i-* 'this', as another case in point.[158] In both instances the suffixes also appear on fused nouns, and *-nti* additionally functions as a spatial locative referring to an 'external and peripheral area' (Chamoreau, in press). The presence of these nominalising suffixes on the demonstrative root *i-* is perhaps not surprising, since demonstratives are traditionally generally categorised as nominals, being able to take case marking and plural marking, for example. This could also explain their presence on numerals and adverbs (see Section 6.4.1) since they are also categorised as sub-classes within the nominals (see Foster, 1969).

As such, I can offer no satisfactory definition or reconstruction for these nominalising suffixes at the present time, other than to suggest that at some point at a much earlier stage of the language they must have possessed more transparent semantics that came to fulfil some kind of classificatory role on nominal elements, including nouns, demonstratives and numerals. Their semantic opacity, coupled with that of many roots, leads us back to Friedrich's (unpublished) early insights into Purepecha structure and semantics, whereby "the actual meaning of any given derived form depends on the context in which it is uttered, or upon the idiomatic specificity". In the next section I will explore the continuum of semantic specificity observable in

[158] A further demonstrative *i-ma* 'that' also exists in Purepecha, and has been drawn in to function as the third person singular pronoun.

Purepecha roots, linking it back to the interpretation presented in Chapter 5, that some roots are more appropriately presented in terms of concepts rather than specific translations.

6.4. Semantic underspecificity in Purepecha roots?

The issue I address in this section and the next is exemplified by the (far from exhaustive) sets of lexemes associated with the roots *kurhi-* (Table 29) and *ja-* (Table 30), whose glosses are generally given as 'to burn' and 'to be' respectively. Note that suffixes whose glosses are uncertain are marked with a bracketed question mark, while those that could not be analysed are marked with a single question mark.

Root	Suffixes	Gloss	Meaning
kurhi-	-kata	PTCP.PST.PASS	burned
	-nta	SP.LOC.around.side.of(?)[159]	bread
	-ch'u-ta	SP.LOC.lower.and.bottom.area-CAUS	to stoke (e.g. a kiln)
	-nhi-ku	SP.LOC.interior.enclosure-NMZR	painful sore throat
	-ra-kwa	CAUS-NMZR	lime (lit. that which makes burn)
	-k'u-xa-ka=ni	SP.LOC.manual-AOR-1/2.S.ASS.1	I burn my hand

Table 29: Selection of derivations of the root *kurhi-* 'to burn'

[159] It is not clear whether the suffix here is functioning as the locative space suffix, as it is glossed, or whether it should be analysed as either (i) the homophonous directional suffix that emphasises an action being in progress, as in *incha-nta-* 'be in the process of entering', or (ii) the equally homophonous nominalising or classifying suffix in words such as *tsá=nta* 'light' (n.) and *xïra=nta* 'book, sheet'. It could be argued that the three instantiations of the suffix constitute semantic extensions of the one suffix (an analysis not incompatible with zero-derivation), with the spatial and nominalizing examples being the closest semantically.

The examples in Table 29 demonstrate that the root, here *kurhi-*, can take various derivational suffixes in order to form verbs (rows 3 and 6), nouns (rows 2, 4, 5) and a participle (row 1).

Root	Suffixes	Gloss	Meaning
ja-	-ma	SP.LOC.open.area.with.liquid	to go, walk, wander about
	-nska	SP.LOC.extended.flat.surface	to be or to make something well (especially referring to buildings)
	-nti	SP.LOC.interior.surface.of.angle.on.vertical.axis	to be or get dirty (referring to floor or ground)
	-rha	SF[160]	to be
	-nts-pi-ri	MOT-ANTIP-AGT.NMZR	servant

Table 30: Selection of derivations of the root *ja-*

Likewise the examples in Table 30 show how derivational suffixes can alter the meaning of the root to form a variety of verb stems (rows 1-4), and nouns (here exemplified only in row 5). Both roots share the feature of, first taking a suffix of locative space, where one occurs, and then, adding valency followed by aspect (here the aorist) and mood/person marking (here first/second person assertive), where appropriate.

However, it should be highlighted that the specificity of the semantics of the two roots presented above varies quite drastically. *Kurhi-* is a semantically transparent, or largely specified, root, as opposed to *ja-*, which is semantically opaque and can thus be considered underspecified. It is traditionally translated as 'to burn', and indeed some of the denotations in Table 29 are more loosely related to the concept

[160] See Foster (1969: 119-120) for a presentation of the 'relocalising' ablaut set in /rh/, to which the stem formative *-rha* here belongs. This set of suffixes occurs, *inter alia*, after verb stems of some of Foster's verb classes, including *ja-*, often translated as 'to be'.

of burning than others, albeit through fairly transparent semantic extensions. Take *kurhi-nhi-ku* 'painful sore throat', for example: here the root related to burning is augmented by a locative space suffix relating to an interior enclosure where the burning takes place, here the throat, and a nominalising/classifying suffix *-ku*. A key feature of this root is that its meaning closely relates to an action or state related to burning, rather than to a more abstract concept; in other words, the root's meaning is clearly effable (see the discussion in Section 6.5.1). It therefore seems more appropriate to translate this root as the concept √RELATED TO BURNING. Another example of this more transparent type can be observed in Table 31 with the root *ero-* √RELATED TO WAITING.

Root	Suffix(es)	Gloss	Meaning
	-ka	verbal thematic, immanent[161]	to wait a while
	-kś(i)	NMZR[162]	*comal* (flat, thin, round hotplate of clay)
	-nti	SP.LOC.external/peripheral.area	to wait indefinitely
ero-	-sta	?[163]	to level off
	-pi-nta	ANTIP- SP.LOC.around.side.of.sth.	to await guests with food, as a *carguero* at a fiesta
	-RD-	RD-	to be waiting with anxiety
	narhi	SP.LOC.principal.flattish.area	

Table 31: The more transparent root *ero-* and a selection of its derivations

It is immediately clear that the majority of meanings in Table 31 are directly related to the concept of waiting, although the link to 'levelling off' and 'comal' is difficult, if not impossible, to identify. With reference to *-ka* in the first row, this suffix is found in the stem formative position with the roots in (21).

[161] This is Foster's (1969:196) terminology. See also Section 6.1 for a short discussion.
[162] Note that I continue to gloss this suffix simply as a nominalizer, despite having demonstrated in Section 6.2.1 that this is somewhat inaccurate.
[163] It is possible that this suffix is historically complex, comprising *-sï* and *-ta*. The same *-sta* ending is found on six nouns in the Friedrich dictionary, including *póksta* 'large clump of earth' and *tsopsta* 'knot in tree'. I discuss potentially complex suffixes such as this, and *-kś(i)*, in Section 6.5.1.

(21) *ire-ka-* ‘to live, dwell’
korho-ka- ‘to make noise, be audible at a distance, something out of sight (trans.)’
washa-ka- ‘to sit down’

Together with the meanings in Table 31, the first two examples in (21) suggest that *-ka* may be related to duration or distance, either temporal or physical. Indeed Foster (1969: 133) explains it as a suffix that defines the verbal sub-classes 3 and 4, with a meaning of prolongation or stasis after the action expressed by the stem. However, its combination with the root *washa-* to form a punctuated activity weakens this interpretation somewhat. A more nuanced understanding of the semantic contribution of the suffixes involved is needed in order to track possible shifts of meaning here, of which Section 6.2 is a first step, in relation to fused nouns specifically.

In contrast, the meaning of *ja-* in Table 30 is much harder to pin down, strongly suggesting it is an opaque or semantically underspecified root. The spatial locatives functioning here as stem formatives, with which the root in rows 1-3 has combined, do not provide clear semantic specificity to produce a clear compositional meaning for the full stem. For example, it is hard to construct the compositional meaning of the root *ja-* plus the spatial locative *-ma* ‘open area with liquid’, instantiated most commonly as mouth, lips, teeth, shin, liquid, or oral function (Chamoreau, in press) into a meaning relating to walking or wandering. While the spatial aspect of *ja-nska-* ‘to be or to make something well’ (especially referring to buildings) is comprehensible, insofar as one can visualise the walls of a building as extended flat surfaces, the ‘making’ (rather than the being) element of the stem is somewhat harder to consolidate. As a root, then, *ja-* has rather more opaque semantics; it is much closer to being ineffable than *kurhi-* above. Nonetheless it seems to incorporate an existential predicative meaning such as ‘to be’, albeit a vaguer type of ‘being’ than this translation would suggest. As such I am reluctant to ascribe any meaning to this root more specific than √STATE OF BEING. Another example of this type of opaque, or underspecified root, can be found in Table 32, where the root *anta-*

is translated by Friedrich as 'approach, arrive, emerge, come', reflecting its polysemous status.

Root	Suffix	Gloss	Meaning
	-kwarhi	REFL	to win, earn something
	-ku	APPL.3.O	to defeat, overthrow
	-kwira	?	to enter, pass boundary
	-ni	NMZR	sunflower
anta-	-pera	RECIP (?)	to pass another, lower things slowly
	-ra	CAUS	to climb, ascend, win
	-ta	CAUS/SP.LOC.flat-vertical	to emerge, come out (as of a pimple; intrans.); to pronounce

Table 32: Example of a semantically more opaque root and a selection of its derivations

In a similar vein to the root *mi-* 'referring to opening or closing' introduced in Section 6.1, *anta-* in Table 32 can represent quite opposite meanings when combined with different suffixes, such as *anta-kwira-* 'to enter, pass boundary' versus *anta-ta-* 'to emerge, come out'. As such, we are faced once again with the dilemma of how to translate the root, or rather how to express its underlying concept. Without the addition of a suffix, the root *anta-* refers to the concept of passing (through) a point or limit. That limit can be more concrete, in the sense of entering into or emerging from, say, a room or other enclosed space, or more figurative, as in the sense of winning (see *anta-kwarhi-*), where a more abstract line has been crossed.

With reference to such semantic assignment, Don & van Lier (2013: 58) assume that a root has an inherent meaning, in the sense of either a basic object or basic action meaning. However, the specificity of that meaning evidently varies in Purepecha, and cannot be claimed to be as fixed and transparent as in English, for example. Yet, if roots are varyingly underspecified semantically, then we could surmise that much of the compositional meaning of a stem (or noun or inflected verb)

must derive from the suffixes, of which Purepecha has a large number (see Section 6.2 for a discussion of the 50-plus nominalising and/or classifying suffixes). Indeed Friedrich (unpubl.) suggests a similar interpretation:

> "In the most general sense, roots ranging from high specificity to extreme vagueness (zero content) are combined with thematic suffi[xes] with high and specific denotation. The result varies from a simple a plus b equals a plus b, to the great majority of cases where there is some idiomatic specialization, where the whole cannot be deduced from the sum of the minimal denotative meaning of the parts."

This lack of clear semantic compositionality, together with their possible polyvalence, was demonstrated in Sections 6.2 and 6.3 by focussing on the opaque nature of the nominalising/classifying suffixes. Chamoreau (in press) claims, however, that stem formative suffixes specifically (which may also be locative space suffixes), whose meaning may also be difficult to pin down, may "change the meaning of the root". On the contrary, I propose that the root's semantics - that is, the more or less vague concept it represents - remains unchanged, but that the subsequent suffix, or combination of suffixes, supplies greater specificity to the compositional whole. A supporting example for this position comes from the sensory domain (22a-b).

(22a) jio-jio-k'u-nti-ni[164]
stink-RD-SP.LOC.manual-SP.LOC.external/peripheral.area-NF
'to smell bad, stink'

(22b) jio-marha-ni
stink-SP.LOC.taste-NF
'to have a bad taste'

[164] Note that only the smell form contains a reduplicated stem. This reflects the standard template for forming basic smell terms in Purepecha but does not alter the semantics such that a comparison with the taste template cannot be drawn. See Section 5.3.3.1 for more detail.

Here the root *jio-* combines with two different sets of locative space suffixes to refer to either perceiving something unpleasant through the nose (22a) or the mouth (22b). As such, the information pertaining to the medium of perception is carried by the suffixes, rendering the root a more generic element that can be translated as 'referring to an unpleasant sensation', or more succinctly an abstract concept of √PERCEIVED FOULNESS (see also Chapter 5). Examples (23a-b) also demonstrate how the suffixes provide specificity to a more generic root (see also examples (3a-e) in Section 6.1).

(23a) tapo-k'u-
catch-SP.LOC.manual
'catch or receive in hands'

(23b) tapo-cha-
catch-SP.LOC.large.narrow.area[165]
'catch in mouth (as of dog)'

That greater semantic load can be carried by suffixes, as demonstrated in (22a-b) and (23a-b), should not come as a surprise to those familiar with Purepecha grammar. The language is characterised by, *inter alia*, a templatic word structure (see Section 2.5.1), whereby meaning-bearing units (i.e. suffixes) can only be added to the right of the root - in a largely fixed order - to derive a new or elaborated meaning. In example (24), the directional morpheme *-pu* indicating movement towards directly follows the stem (root plus the stem formative or voice/valency marker *-ku*[166]), to indicate that the action of cutting happens in this manner. The addition of the progressive aspect marker takes scope over the centripetal cutting action, and finally the person marking indicates who carries out the whole action.

[165] Note that the spatial locative *-cha*, glossed here as 'large narrow area', refers specifically to bodily regions involving the neck, throat, larynx, or penis. It can have an oral function, mainly in a criticising sense, and also refer to grain, in a single non-corporeal sense (Chamoreau, in press).
[166] Friedrich (1984: 67) describes *-ku* as one of three "powerful" suffixes, the others being the causatives *-ra* and *-ta*, which indicates transitivity or focuses the action of a verb toward a specific object

(24) kachu-ku-pu-xa-ti
cut-SF-DIR.centripetal-PROG-3.S.ASS
'He comes cutting' (Adapted from Chamoreau, in press)

Importantly, as demonstrated in Section 2.5.1, each new element added to the right of the root occupies only one slot and has scope over all those elements to its left (see, e.g., Rice, 2011; Bybee, 1985; Foley & Van Valin, 1984). As such, it is fair to expect the stem formative (in the form of a spatial locative, valency morpheme, or other, funcationally unclear suffix) to take semantic scope over the root, after which it will be incorporated into the compositional meaning provided by further derivational and inflectional suffixes.

However, as we - and Friedrich (unpublished; see citation above) - have already observed, the semantic whole of a word can appear greater than the sum of its parts. We find examples such as the fused nouns discussed in Section 6.2.1, whereby the combined semantics of a given root plus suffix(es) does not generate an obvious derivative, semantically speaking. Yet the ability of many roots to take multiple different nominalising/classifying suffixes, as well as suffixes that produce adverbs or numerals as well as verbs when attached to roots, suggests that they do not necessarily belong to one word class only. In other words, it appears difficult to ascribe a word class to these roots, given their multifarious derivational possibilities. I explore this possible polyvalent interpretation, in light of previous analyses of roots in Purepecha, in the next section.

6.5. On the 'verbiness' of roots in Purepecha

A common observation in relation to Purepecha is that it is a verb-dominated language. Foster (1969: 41), for example, explains how "[v]erbs constitute the core of the language, indispensable to the sentence [...] and containing within themselves almost the entire phrase or clause in microcosm [...]." It is true that verbal morphology is extensive and complex, enabling the Purepecha speaker to encode myriad semantic and syntactic nuances potentially in one multi-morphemic word (see also Section 1.5.2.2). Purepecha is therefore both a heavily agglutinating and moderately

polysynthetic language. These two characteristics can be highlighted by the language's complete reliance on suffixes, with little fusion between morphemes, and, *inter alia*, the ability to encode internal and external arguments within the verbal complex (see Chamoreau, 2017). However, a certain amount of disagreement exists regarding the nature of the element to which the suffixes in these agglutinating lexemes attach, namely the root. Many scholars analyse, or simply accept, the root as fundamentally verbal, with other word classes derived from it through nominalisation or deverbalisation (Chamoreau, in press; Capistrán Garza, 2015; Domínguez Hernández, 2015; Capistrán-Garza, 2013; Vázquez Rojas Maldonado, 2012; Villavicencio, 2006; Lagunas, 1984 [1574]). Some remain either agnostic or non-committal as to the class of the root (Lucas Hernández, 2014), while others claim it to be polyvalent, that is not belonging to one single word class (Swadesh, 1969; parts of Foster, 1969). In this section I will present an overview of interpretations of roots in the literature on Purepecha morphology.

Let us begin with the root-as-verbal perspective. Chronologically Lagunas (1984 [1574], cited in Villavicencio, 2006: 63) was the first to take this position, on the basis that one merely had to replace the "infinitive" suffix *-ni* with, for example, *-ri* or *-ti* to create an agentive noun of the action of the verb, or with *-rho* to indicate the place where such an action occurs (see also Section 6.2). The main issue with this interpretation is its over-reliance on Latinate grammatical categories; the use of *-ni* to indicate the infinitive mirrors the *-ar*, *-er*, *-ir* terminations of Spanish verb classes and, in reality, it is a constructed citation form that has entered general usage in dictionaries and grammars as well as in language teaching. It is clear that *-ni* does indicate the non-finite mood, but this is not the sum total of its usage. When a root (or stem) combines with *-ni*, and often also other intervening suffixes, it can occur in one of three contexts: (i) as a main verb that takes TAM marking, (ii) in a complement clause where one participant, generally the agent, is co-referent with the argument of the main clause, and (iii) in a chain-linking clause that is syntactically independent from, but semantically dependent on its surrounding clauses (Hernández Domínguez, 2015: 58). As such, its interpretation as an 'infinitive' marker à la Lagunas is overly restrictive.

Hernández Dominguez (2015: 51) agrees with Lagunas, as well as with the much more recent perspectives of Chamoreau (in press), Capistrán Garza (2015) and Villavicencio (2006), in claiming that most roots are verbal and that "a large percentage of substantives and adjectives come from the verbal root" (citing Villavicencio, 2006: 63; my translation). According to Chamoreau (in press) "[t]he majority of nouns are built from verbal stems with the addition of a nominalizer suffix". In some cases a derivational suffix is required directly after the root and before the nominaliser, such as the causative marker *-ra* or one of the 30-50 spatial location suffixes, e.g. *-nari* 'principal area' in *era-nari-kwa* 'mirror', lit. 'look-LOC.SP.principal.area-NMZR' (idem.). In other cases, however, nominalising or classifying suffixes can attach directly to the root, a situation I discussed in Section 6.2 regarding the construction of fused nouns. In yet other cases, as exemplified in Section 6.4, the same root can directly take both nominal and verbal morphology. In this sense, then, it is hard to formally distinguish separate sets of nominal and verbal roots, as both nouns and verbs can seemingly be formed either directly from a root or require intervening morphology before taking their class-specific morphology, namely TAM inflection or a nominaliser respectively. Yet let me reiterate that various accounts of Purepecha morphosyntax clearly treat roots as inherently verbal.

Indeed part of the root as verbal root analysis, and a way of dealing with the problem of the existence of a wide variety of syntactic structures that are associated with the same verbal morphological structure, is the establishment of root, or verb, classes (see notably Monzón, 2004; Friedrich, 1984; Foster, 1969). Foster (1969: 161-170) identifies seven classes on the basis of morphological and syntactic criteria, as well as providing a semantic definition for each class (indicated in italics), as follows:

1. Transitive stems with no further thematic suffixation, e.g. *exe-ni* 'to see'
   Action-defining, with diffuse behavioural patterns not definable in terms of movements (bodily or otherwise), but an action that may be performed on or toward another, or by an agent, e.g. u- *'to do',* t'ire- *'to eat'.*
2. Intransitive stems with no further suffixation, e.g. *tsa-ni* 'to be hot, sunny'
   Similar meaning to Class 1 but the action is performed by an actor on or for the self, or the actor is indefinite without an object, e.g. kw'i- 'to sleep', *che-* ' to fear'
3. Transitively diagnostic requiring further suffixation, e.g. stems in *-nturhi* 'fragmented'
   Some kind of spatial, temporal or ideational displacement, dislocation or disjunction meaning.
4. Intransitively diagnostic stems requiring further suffixation, e.g. *sharha=ra-ni* 'to shine'
   Meaning involving continuation, suspension or protraction of action/state.
5. Classificatory stems requiring further suffixation, e.g. *ana=nte-ni* 'to be vertically upright'[167]
   Meanings definable in terms of shape not action, e.g. unpa- *'heap of small objects'*
6. Adjectival stems requiring suffixation, whose resolution is intransitive, e.g. *ura-pe-ni* 'to be white'[168]
   Meanings relating to basic or intrinsic characteristics or qualities, e.g. wina- *'strength'*
7. Enumerative stems, either nominal or verbal, where the latter occur with verbal thematic suffixes, e.g. *tsima-ra-ni* 'to be two'
   Numeral meanings, e.g. tsima *'two'*

Friedrich's (1984) classification of verbal roots largely reflects Foster's (1969), as presented above, although it comprises six rather than seven classes, with only the

[167] See also Capistrán Garza (2002) for a more detailed treatment of the class of classificatory verbs.
[168] Foster (1969: 168) identifies, however, two transitive themes, namely *wirhi-pe-ni* 'to turn upside down' (vs. *wirhi-pi-t*i 'round, circular') and *tsïri-pe-ni* 'to present the bridal dress'.

enumerative class missing. His classification also hinges on the transitivity inherent to the root or stem, with classes one to four defined in terms of their boundedness and valency.[169] He defines 'active' roots as referring to an action that passes from an actor/agent to a patient/goal, being instantiated by transitive, causative, jussive and instrumental values. 'Middle' is likewise defined as an action that reflects back on the subject or operates reciprocally between subjects, or is immanent in and/or emerges from within the subject, such as 'to be hard', 'to dance' (Friedrich, 1984: 65). Classes five and six are considered separately with different diagnostics, thus:

1. Free, active, e.g. *pá-* 'carry, take'
2. Free, middle, e.g. *p'ukú-* 'to ripen'
3. Bound, active, e.g. *tsi-tá-* 'loose'
4. Bound, middle, e.g. *hawá-ra-* 'to rise'
5. Shapes, thematised by spatial suffixes, e.g. *irá-* 'round'
6. Four basic colours and basic qualities, e.g. tasty, lazy, strong, thematised by *-pi* or a spatial, e.g. *winha-pi-ti* 'strong'

It should be noted that classes five and six are defined in more semantic terms, albeit with certain morpho-syntactic thematisation, whereas classes one to four rely on morphological and syntactic characteristics only; their semantics are not elaborated. Yet as Foster (1969) already highlights, these classes are not watertight and a certain amount of overlap is admitted or exceptions to a group can be found. Indeed, Monzón's (2004) three-way root classification based on the spatial locative suffixes a given root can take has fairly fluid boundaries, comprising: (i) {Y} roots (form and shift/movement) that are dependent (i.e. require further suffixation before being able to take TAM morphology) and transitive[170] in nature, relating mainly to notions of form and position where the space in question is a location, such as *chaki-* 'swollen,

[169] Friedrich (1984: 65) defines 'active' as referring to an action that passes from an actor/agent to a patient/goal, being instantiated by transitive, causative, jussive and instrumental values. 'Middle' is likewise defined as an action that reflects back on the subject or operates reciprocally between subjects, or is immanent in and/or emerges from within the subject, such as 'to be hard', 'to dance'.
[170] However, these roots are also defined as being generally stative, which does not concur with a transitive reading (Monzón, 2004: 314).

not solid'; (ii) {X} roots, a very diverse group with no unifying semantic or morphological criteria other than space being characterised as a patient, in which two main sub-groups can be identified: one whose root is intransitive with limited combinatorial properties with suffixes of space and voice, and a second which allows any combination, considered transitive; and (iii) {X'}, whose only five roots mostly also belong to the {X} group but space is characterised here as a place rather than a patient. Its small, overlapping membership makes this group peripheral at best. In more general terms, this more restricted classification appears contradictory in parts and can offer no clear morpho-syntactic or semantic properties that distinguish each class from the other.

None of the three classifications described above are able to predict the membership of a root taken alone; only once a form is shown with particular valency-changing or spatial locative morphology can its class membership be identified. Similar to Wares (1956), the assignation of a root to a particular class in these models appears somewhat circular; its independent form alone is not a predictor of its class membership. Indeed, the difficulties inherent in defining verb or root classes from both morpho-syntactic and semantic perspectives suggests that such a classification may not be a productive, or even necessary, endeavour. Indeed, an alternative set of interpretations for the Purepecha root also exists. Foster (1969: 41), contrary to her later stem classification outline (as presented above), states that "[s]tems are generally multivalent; that is, shared by words of more than one form class [i.e. nouns and verbs]." She continues: "Stems of each substantive class [i.e. nouns, pronouns, adjectives, adverbs, and numerals] constitute a stem class (except pronouns and some adverbs) also shared by verbs," (idem.). With reference to suffixes, she claims that they can be either verbal or substantive (i.e. nominal), where verbal suffixes can be shared with other word classes whereas the substantive suffixes only apply to this class, albeit usually to more than one sub-class of substantives (e.g. adverbs; see Section 6.2). In terms of semantic composition she states that "[s]tem morphemes are of very general meaning, describing such semantic areas as direction toward or away from, contact, protrusion, penetration, reversal, etc." (idem.), although she gives no specific examples. More importantly for this chapter, and in support of the argument

for the semantic under-specification of the root, she proposes representing these concepts (i.e. the general stem meanings) with symbolic devices rather than with verbal definitions, as in Figure 13.

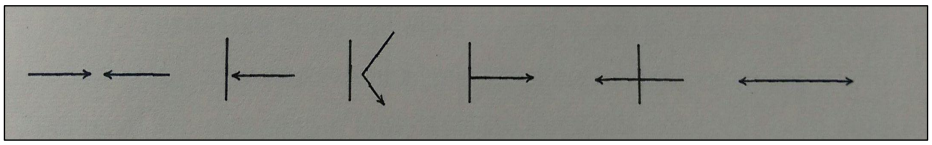

Figure 13: Foster's (1969: 41) symbolic representation of stem morphemes in Purepecha

For Friedrich (1984), roots are less abstract, although still flexible. He proposes that roots fall along a continuum comprising those that function mainly in what he calls the "verbal system" at one extreme to those that operate mainly in the "nominal system" at the other.[171] Other roots sit between these two extremes and, more importantly, "any nominal root can be verbalized to some extent, just as any verbal root can be nominalized at least in some ways" (Friedrich, 1984: 65). This interpretation could lend support, however, to the notion that the root is category-less, or that it can change word class depending on the suffixes that follow.

In his rarely cited work on suffixation in Purepecha, Wares (1956) claims that stem classes[172] can be defined by the suffixes that follow them, thus verb stems are followed by verb suffixes, such as locatives, aspect and person marking, and noun stems are followed by noun plural and nominal case endings. One interpretation of this rather circular definition is that the root is by itself category-less. In order to become a verb stem or noun stem, and then by default a noun or verb, a stem or root requires suffixes. Similarly, despite referring to roots as verbal roots only some of the

[171] It should be borne in mind, however, that he too (like Foster) offers both a polyvalent interpretation of roots and a six-way classification of roots as verbal roots, as indicated earlier in this section.
[172] Wares (1956) prefers the term 'stem' over 'root', although he does not give a clear definition of either in his short grammar sketch. Chamoreau (e.g., in press) distinguishes between a root and a stem in verbal morphology: the former is bare and can take inflectional morphology directly, whereas the latter must be combined with a stem formative before being able to take any subsequent morphology. See also Section 1.5.2. I follow Chamoreau in differentiating between the two units.

time,[173] Lucas Hernández (2014: 123) also claims that "the root by itself does not have these meanings [listed in the table above the citation in the original, not required for our purposes here] and acquires them thanks to the morphemes that attach to it". This view holds much in common with that of Wares (1956; see also Hernández Domínguez, 2015: 47).

We have observed in this section that the status of roots in Purepecha has already been the focus of a reasonable amount of scholarly attention. Some accounts consider roots to be verbal, allowing the formation of nouns through suffixation (i.e. nominalising suffixes), while others view roots as flexible or even polyvalent, namely able to form multiple word classes. Yet the root or verb classifications proposed to date cannot adequately group their members on the basis of morpho-syntactic or semantic properties. As such, a more flexible approach seems potentially viable. Let us now examine flexibility - or more accurately lexical flexibility - in more detail.

6.5.1. Underspecification as a type of lexical flexibility

It is instructive to clarify, at this stage, how I am using the terms 'flexible' or 'flexibility' in relation to Purepecha roots. From the outset, it should be underlined that I am not claiming that Purepecha lacks a noun-verb distinction; rather quite the opposite is true and nouns and verbs constitute the two main word classes in the language (see also Section 1.5). Yet some of the descriptive and typological literature on word class flexibility can be rather vague or confusing, conflating several phenomena under the same term (Evans & Osada, 2005: 38). As such, it is useful here to draw on Van Lier and Rijkhoff's (2013: 2) distinction between the two main types of lexical flexibility.[174] The first type comprises languages whose units - i.e. roots or lexemes - are precategorial or category-neutral until they have been expanded by affixal derivational material. The second type, termed here 'acategorial', comprises units that can belong to two or more word classes, if indeed it is appropriate to posit part-of-speech categories for such languages. I propose that Purepecha belongs to the

[173] I take the fundamentally verbal nature of roots to be implied through this lack of consistency.
[174] But see Evans & Osada (2005), for a more fine-grained (i.e. four-way) typology of flexible languages in the second sense - i.e. purportedly lacking the noun-verb distinction; for the purposes of this paper the two-way typology suffices.

first type of flexible class, namely it is precategorial. To provide support for this proposal, building on the previous section, I will briefly outline how these two types of lexical flexibility differ.

In their treatment of Mundari word classes, Evans and Osada (2005: 362) note that the term *precategorial* "has been used in a variety of ways in the literature, often rather loosely."[175] However, rather than getting bogged down in the minutiae of terminological differences, I choose to define precategoriality in terms of Himmelman's (2004: 129, following Verhaar, 1984) precategorial bound roots, or:

> "[...] lexical bases which do not occur without further affixation or outside a compound in any syntactic function and from which items belonging to different morphological or syntactic categories (nouns and verbs, for example) can be derived, without there being clear evidence that one of the possible derivations from a given root is more basic than the other one(s)."[176]

As such, precategoriality can be considered a feature of roots rather than lexemes and is therefore compatible with the existence of syntactic categorial distinctions between nouns and verbs (amongst others), which is clearly the case in Purepecha.[177] Underspecified objects, here roots, do not fall into one of the traditional word classes because they are "characterized by their multifunctional behaviour or rather the *potential* to develop into various more specific types" (van Lier & Rijkhoff, 2013: 3-4, emphasis in original). In the case of Purepecha, I propose that roots do indeed have the *potential* to become nouns or verbs, but only once word-class specific morphology has been appended. It is worth noting that several different grammatical theories or frameworks, notably Distributed Morphology, assume that "flexible items are provided with some (verbal, nominal, adjectival, etc.) categorial specification (in the

[175] More specifically, they define a language as precategorial when its open-class lexemes can occur in any syntactic position, but in order to function as a predicate-like element, a lexeme must receive further morphological material, according to its functional position (Evans & Osada, 2005: 362).
[176] Himmelmann (2004: 128-129) also offers a four-way distinction between the different scenarios in which lexical bases (roots) can be underdetermined in the Austronesian languages.
[177] The existence of a separate class of adjectives in Purepecha remains a controversial issue. See Section 1.5.2 for a short discussion of the problem and previous analyses.

form of a syntactic slot, a label, a constructional frame, etc.) after they have been retrieved from the mental lexicon," (van Lier & Rijkhoff, 2013: 5). It could be argued that this may be the case in Purepecha, where categorial specification is achieved through the addition of suffixes to a precategorial root.

As for the semantics of precategorial roots, Evans and Osada (2010: 364) claim that "precategorialist treatments typically state that lexeme meanings are ineffable, outside their particular use in predicate or argument slots." There is an element of truth to this statement in the Purepecha context, insofar as some roots are clearly underspecified semantically (see example (3); recall also the case of underspecified roots in Muysca (Adelaar, 2005)) and only take on more transparent, although not necessarily concrete, meaning when expanded with one or more suffixes (see Section 6.4 for a more detailed discussion of the role of suffixes in synchronically fused nouns). I have argued that, in order to represent the meaning of these roots, a conceptual label such as 'RELATED TO BURNING' should be applied, rather than a traditional translation of the type 'to burn' in this instance, but that even the semantically more opaque roots are effable, conceptually speaking. Such an approach prevents both an overly vague interpretation, such as that offered by Foster (1969) in Figure 13, and an overly simplistic reductionist translation, as commonly found in much of the existing literature.

The nature of the second type of lexical flexibility considered here, which I refer to as 'acategorial', underpins a fundamental typological question: do all languages possess a noun-verb distinction? It has been claimed (see notably Whorf, 1956) that humans find the cognitive distinction between objects, usually expressed as nouns, and events, usually expressed by verbs, to be self-evident. At the beginning of the twentieth century, initial evidence was put forward from Mundari (Hoffman, 1903; cf. Evans & Osada, 2005) and Malayo-Polynesian (Sapir, 1921) that refuted this 'self-evident' universal. Later, in his discussion of the bipartite nature of Nootka (Wakashan, California) stems, Hockett (1958: 224) aimed to "disprove the assumption that the contrast between nouns and verb is universal on the level of parts of speech". Rather than presenting a traditional noun-verb distinction, Hockett (1958: 224-225) claimed that Nootka stems were either inflected or uninflected, where the

former could behave syntactically either like nouns or like verbs. This view has also been put forward under the label of 'omnipredicativity' or 'polyvalence'[178], whereby all major word classes are able to function directly as predicates without derivation or a change in semantics (see Evans & Osada, 2005: 359; Lois & Vapnarsky, 2003).

Classical Nahuatl is held up as a prime example of an omnipredicative language (see Launey, 1994 for a full description) since "both nouns and verbs can have equivalent possibilities for being employed in predicate or argument slots" (Evans & Osada, 2005: 360). Languages of the Salishan family have also been analysed this way by some, on the grounds that all full words, including proper nouns, can function as predicates and may be inflected with person markers (see Czaykowska-Higgins & Kinkade, 1997: 35-37, also for counter-arguments from both formal and psycholinguistic perspectives, as well as references for both analyses). Additionally, some (but not all) roots in the Yukatekan Mayan languages are claimed to be multivalent, that is the root can be used as different lexical categories without involving any further derivational processes (Lois & Vapnarksy, 2003). That said, it has been argued for all the languages discussed here, that a formal distinction can still be made between nouns and verbs on the basis that there is not full bidirectional flexibility, in other words that not all nouns can function as verbs and/or not all verbs can function as nouns.[179] Indeed, it is now generally accepted that all languages possess a noun-verb distinction at some level (see Croft, 2003), that is they distinguish both cognitively and syntactically between objects and events. Yet precategoriality remains a possibility for the analysis of roots in Purepecha, albeit one that requires further investigation beyond what this chapter has begun to address.

[178] I have not included the so-called 'Broschartian' analysis of flexible word classes (see Evans & Osada, 2005: 364-365), best known for the case of Tongan, where the placement of a lexeme in a predicating or argument environment is characterised by patterns of semantic incrementation. Broschart's (1997) type vs. token analysis largely which parallels a reference vs predication approach, focussing on the polysemous extensions of lexemes. In the interests of clarity and brevity, I only mention this approach in passing and refer the reader to Broschart's (1997) paper on the topic for more detail.

[179] It is also worth noting that for all the cases presented here, a minimalism-inspired zero-derivation analysis has been avoided. In such an analysis, separate, homophonous terms are posited for a language, e.g. hammer (n.) vs. hammer (v.) in English, and the appropriate syntactic category assigned through zero spell-out of the functional head (see, e.g. Don & van Lier, 2013).

6.6. Concluding remarks

This chapter has attempted to show how the meaning of roots in Purepecha can range from the semantically transparent to the seriously opaque, and introduced the idea that roots could be considered precategorial rather than inherently verbal. Moreover, instead of carrying the contextual information required to form contrastive lexical units, it showed how suffixes are also often semantically opaque, leading to a situation where the compositional meaning of a lexeme is barely derivable simply from its individual components. Suffixes may not even be indicative of word class, rendering their semantics even harder to define. It may be more appropriate, therefore, to define and translate both roots and suffixes, where the semantics are at the opaque end of the meaning continuum, in conceptual terms, as in the aforementioned examples of PERCEIVED FOULNESS or RELATED TO BURNING, rather than attempting to assign or favour an individual meaning in the form of an infinitive, as in traditional dictionary entries. Indeed when compiling dictionaries and grammars, more attention needs to be paid to the role of suffixes in word formation, since they can create meaningful oppositions even where the semantics are opaque.

More specifically, it is clear that the set of fused nouns analysed in this paper comprise a root plus a synchronically unproductive nominalising or classifying suffix, however both the synchronic and diachronic meaning of many of these suffixes remains opaque. While they appear to be functioning similarly to Grinevald's (2000) 'class terms', the lack of obvious origin in an independent lexeme in some cases is both intriguing and frustrating. As such, a great deal more language-internal research, including internal reconstruction and the identification of roots in the proto-language, is required in order to expand the present analysis as well as our understanding of the development of Purepecha as a completely suffixing, agglutinating language. The relative semantic contribution of roots and suffixes could also open the way for a more theoretical interpretation, such as in a Distributed Morphology framework (see, e.g., Harley (2012) for an introduction), but more detailed functional synchronic and diachronic work is required before such an approach could be considered.

7. DISCUSSION AND CONCLUSIONS

"Given that God is infinite, and that the Universe is also infinite...
would you like a toasted teacake?"
(Talkie Toaster to Holly, 'White Hole')

7.1. Recap and methodological reflection

In order to investigate questions pertaining to the external relations of Purepecha, from the perspectives of both relatedness and contact, as well as to language-internal issues of word formation, I have used a number of different methods in this thesis. This broad, multi-pronged approach recalls Hamp's (1979) three "great categories" of linguistic study: typology, the Comparative Method and areal linguistics (see Section 1.8). Moreover, I have drawn on - and presented - data from archaeology and genetics, as well as from multiple languages of the Americas, not only Purepecha. In this sub-section, I will revisit the methods I used and the - sometimes contradictory - findings they produced, offering a reflection on their utility and appropriateness for my research questions, as well as how they could be supplemented in future research.

Lexical material drawn from standardised wordlists formed the basis for three studies presented in this thesis: (i) the first part of Chapter 2, on the possible genealogical relations of Purepecha, (ii) Chapter 3, which tested the hypothesis of long-distance interaction between the Andes and West Mexico through the lexicon of metallurgy, and (iii) Chapter 4, where I discuss the shifting language contact situations in Michoacán and their potential impact on Purepecha lexicon and structure. Having established that previous studies connecting Purepecha to other languages of the Americas proceeded from an inspectional, or 'multilateral', method for identifying cognate candidates, rather than a systematic comparison method, in Chapter 2 I used a state-of-the-art quantitative method, namely the Oswalt Monte Carlo Shift Test, to evaluate the validity of previous claims. This test found no signal of relatedness higher than that expected by chance between Purepecha and the languages present in the Swadesh (1967) and Greenberg (1987) classifications, including Quechua in the Andes and Zuni in the southwest USA.

However, in Chapter 3 I also resorted to a more traditional inspectional analysis of the lexical data for metallurgy which, given their relatively small and specific nature, was feasible. Loanwords should also be more easily identifiable than deep-time cognates, due to the generally smaller amount of phonological change. The lack of clear loans linking the Andes and West Mexico in this lexical set offers support for the findings from Chapter 2, namely that a connection between the two regions, in terms of either genealogical relatedness or interaction, cannot be claimed on the basis of the current data. A more detailed inspectional analysis of a large-scale standardised wordlist (the REPLICA wordlist), reported in Chapter 4, also revealed a difference in the scale and nature of borrowing in the prehispanic and modern periods. Prior to contact, despite considerable regional linguistic diversity, Purepecha remained rather resistant to influence from other, neighbouring languages, whereas the contemporary language is replete with lexical borrowings, not to mention new, calqued morphosyntactic structures on the Spanish model. As such, both the traditional inspectional method and the more up-to-date quantitative method allow us to test existing proposals in an objective, systematic way, providing measurable and qualitative results that can inform and refine current models of language contact and relatedness. Moreover, the results gathered from the experimental language-internal study of olfactory language (Chapter 5), demonstrate how different elicitation techniques can combine to provide a clearer picture of a particular lexical semantic domain. Natural sources proved, perhaps unsurprisingly, to be the most effective means of eliciting the less commonly used smell terms, while the US-produced 'scratch-and-sniff' smell booklet proved hugely ineffective. The data collected for this study could be further supplemented with naturalistic, corpus data, the creation of which is one of my aims for a future, follow-up project.

While the negative results (i.e. a lack of linguistic relatives and limited contact effects) may seem unsatisfactory on the surface, I contend that it is useful in that it helps to guide future research and avoid replication of unnecessary efforts. Yet, we should also recall that these two negative results from linguistics contrast starkly with some preliminary findings from genetics (Brucato et al., 2015), presented in Section 3.2.2. This study identifies a small but significant Andean component in the

genome of four groups known to have had metalworking in the prehispanic period including, most importantly for the purposes of this thesis, the Purepecha. Given the absence of this genetic component in Central America, an introduction via a Pacific maritime route from the coast of Ecuador and northern Peru (where metallurgy considerably predates its western Mexican counterpart) seems probable. As such, genetics offers very suggestive evidence for interaction between individuals from these two regions, albeit at a still unspecified time in the past. Given the extremely small size of this Andean genetic component, it is most likely that any proposed contact scenario was small-scale and not particularly intense. However, as also noted in Section 3.5, it is also possible that the technological transfer that is likely to have taken place between artisans of the two regions may have occurred in a largely non-verbal manner. Studies from other technologies, such as weaving, have demonstrated that emphasis is placed more on the physical replication of a process than on its linguistic explanation. In sum, there may have been interaction between individuals, but this may not have taken the form of linguistic interaction, certainly not leading to any form of bilingualism or mutual intelligibility. It should also be noted that there is a serious lack of linguistic information regarding the languages previously spoken on the coast of Ecuador, rendering detailed comparisons even more problematic (Willem Adelaar, pers. comm.). Nonetheless, the collection of new, semantically specialised lexical datasets such as this one opens the door for future studies using different methods, such as Bayesian phylogenetics.

The contradictory findings from linguistics on the one hand and archaeology and genetics on the other may reflect a complex situation, which could have comprised multiple possible interaction scenarios over a period of around two thousand years, although their linguistic content is still unclear. They also highlight the fact that we cannot rely on the evidence from one discipline alone if we wish to piece together as comprehensive a picture as possible of prehistoric population movements, social and cultural interaction, and linguistic consequences. Indeed here I echo the need for more multidisciplinary research in western Mexico highlighted by Pickering and Beekman (2016: 21) in their extensive volume on the shaft tomb tradition in this region, where they report that "[…] the recognition of the mutual benefits to multidisciplinary

approaches remains limited in western Mexico." As such, this thesis contributes in a small way to the currently limited multidisciplinary research environment in Michoacán.

Later in the same volume on the shaft tomb tradition, (Beekman & Pickering, 2016: 208) highlight another issue that has plagued studies of Mesoamerican archaeology, and which can also be applied to Mesoamerican linguistics, namely the emphasis on areal similarities rather than regional or local variation. In this vein, they propose that "[a]pproaches that emphasize variable practices rather than normative culture areas can potentially provide a richer and more nuanced understanding of this area's [West Mexico's] participation in broader Mesoamerican prehistory" (Beekman & Pickering, 2016: 208). Thus, while the use of multiple methods and data sources in this thesis may have in a sense clouded our overall vision of the position and role of Purepecha, it casts new light on previous assumptions and, in line with recent calls in archaeology (a sister discipline after all), advocates for a more focussed, language-internal approach. A similar multi-pronged approach limited to linguistics is also called for in Eppler, Luescher & Deuchar (2017: 1) in relation to grammaticality in code-switching, whereby our "advances in our understanding […] will be achieved by combining the insights of different theoretical models instead of considering them in isolation". I reiterate this call for a multi-strand approach, with specific application to the study of prehistoric language and culture, as well as more focused language-specific work, as exemplified by Chapter 6 on word formation processes in Purepecha.

7.2. Hey, linguists, leave those isolates alone!

Language isolates are inevitable when the written record is limited; a partial or complete lack of documentation until modern times severely hinders, if not precludes, historical comparative work. While Purepecha is well documented in indigenous American terms, with written material dating back to the mid-sixteenth century, many of the languages that neighboured it in the prehispanic and colonial periods are not. As such, the methods for identifying possible linguistic relatives are limited (but see Campbell, 2010). Having explored the proposed genealogical relations through quantitative methods, inspectional multilateral comparison (à la Greenberg, 1987) and

typological means, I can only conclude that Purepecha remains an isolate devoid of known relatives. It remains the unsolvable puzzle, rather than the tricky but fundamentally decodable cryptic crossword or Sudoku (see Section 1.1).

The lack of resolution to the original research question of this thesis is certainly compounded by the lack of data for many languages just mentioned, as well as the devastating population and thus also language loss that Mexico (and many other countries of the Americas) suffered in the immediate aftermath of Spanish conquest. It may be that a linguistic relative was spoken close to the known Purepecha-speaking area, but it is hard to envisage a situation now where we could validate this hypothesis. The apparent structural similarities between Purepecha and Quechua, especially in the verbal domain (see Chapter 2) may belie a more ancient connection, although on the basis of existing evidence I am not convinced that this is the case (see Urban, Bellamy and Pache (under review) for a typological study that demonstrates no significant typological link between the two languages on the basis of many more features). Such an ancient connection could also be shared with other languages across the Americas (see Chapter 3 for a selected list of structurally similar languages, such as Athabaskan), but in the face of such a data void, this deep-time claim is presently nothing more than speculation.

The lack of external influence on Purepecha might suggest that its speakers were isolated (in the sense of being geographically and socially apart) from other groups, even though we know that many other languages were spoken within the borders of the Tarascan State, as well as at and around its periphery. Trudgill (2011: 89) rightly states that isolation does not necessarily imply total isolation but rather "an absence of any significant history of the language having been acquired by adult non-native speakers". This situation is presented in relation to minority languages, such as Frisian in The Netherlands, but in the case of Purepecha, we see an example of an elite language (that may not, however, have been the majority numerically speaking) that was presumably not also being learned by adults from other linguistic groups. As such, we might wish to postulate a situation where bilingualism involving Purepecha was not the norm, or only in particularly asymmetric power situations, such as contact with Cuitlatec (see Sections 4.2.3 and 4.4).

Nonetheless, the higher than average number of isolates in the Americas - Purepecha included - remains perplexing. As we saw in the introduction (Chapter 1), we may simply have to remain perplexed, since not all of the pieces to some puzzles, including language isolates, are always available to us. Thus, when it comes to isolates, I suggest that attention should be shifted to improving the state of their description, theoretical analysis, and internal reconstruction (cf. Campbell, 2010), rather than continuing to get bogged down in, sometimes severely speculative, classifications that may rely largely on structural rather than lexical features (see Section 2.2). By conducting careful, detailed language-internal research, we will be able to piece together a much clearer picture of a language's structure which, in turn, will enable more accurate comparative work, if appropriate. One of the biggest issues with the comparative work on Purepecha by Swadesh (1967) and Greenberg (1987) was their lack of attention to internal word structure, leading to situations where phonemes in a root in one language were compared with those in a suffix in another (see Chapter 2). By improving our understanding of isolates, as well as under-described (usually minority) languages more generally, we can avoid the mistakes - or certainly avoid replicating similar ones - committed by previous researchers.

Chapters 5 and 6 of this thesis constitute a first attempt at a more in-depth study of word formation in Purepecha, focusing on the relative semantic contribution of suffixes and roots, including how these contributions play out in the extensive and areally unusual semantic domain of olfaction. This type of language-internal work also promises to increase our knowledge of the vast diversity present in indigenous American languages, especially from a functional-typological perspective. In turn, this broader typological panorama will help us to further refine our knowledge of the limits of human language more generally, including when two or more languages are in contact, a common situation in the Americas (as in the majority of the world). More detailed descriptive studies will also permit researchers in specific theoretical frameworks, such as Distributed Morphology and formal semantics, to test their theories using sound data.

In terms of future research regarding the external relations of Purepecha, I see no reason to pursue further possible genealogical relatives. Equally, investigating

possible structural contact effects on Purepecha as a follow-up to the present, lexically-based study is also unnecessary in my view (see Chapters 2 and 3), since Purepecha's areally divergent grammatical structure is clear (see Section 4.4; see also Urban, Bellamy & Pache, under review; Chamoreau, in press; Smith-Stark, 1994). While possible contact effects could be pursued in more depth, for example by applying a Multilateral Network (MLN) model to extensive, phonologically standardised wordlists (see Section 2.3), I am of the opinion that more language-internal work should take priority. Purepecha is, in the words of Michael Silverstein, "a delicious language", and thus merits in-depth lexical and structural analysis (as it would if it were less delicious too), on the basis of multiple data sources that reflect the diversity inherent to its four main varieties (thereby permitting internal reconstruction of the lexicon and morphosyntax), as well as through the lens of different theoretical frameworks (cf. Section 5.6). This more in-depth understanding of the language will not, in all likelihood, provide the key to the unsolvable puzzle that is the external relations of Purepecha, but it will unlock new descriptive and theoretical insights into the language, its history and development. These insights can, in turn, be applied to more linguistically-informed revitalisation, including language teaching and Purepecha-medium instruction, as well documentation efforts in each of the four Purepecha-speaking regions of Michoacán, with a view to extending them to diaspora communities in North America.

Appendix A: Belmar's (1910) list of Otomanguean cognates with Purepecha

Purepecha	Cuicateco	Amuzgo	Popoloca	Trique	English
akshkua	nagaachi	tsinski		degachi	wing
akuitsee		ketzu			snake
andumukua		dahnu			bile
angatapu	yaan	tzounkua	daka		tree
antzikuni		diotzkado			
ashuni	chenu	tsondeki			deer
atsimu	inchiati	tsuukechi, tsundo	yetsine		clay, mud
chetzkua		tsaa			tail
ehtserukua		sta			forehead
erakata	yaku				high, tall
etzi		dateya			water
etzkuni		tsukuana			to set alight
handaretayarani	kanda				to put [sth] against/next to
harateni	duba	dateyu			to pierce
hikuru		kehnu	kunyia		owl
huuataro	kueti		gandai		mountain
ikichanu	ngakinu				to be nauseous
ikuiuani	nguatibi	getetia			to get angry
iski	tika				like this
itzukua		ndatzu			milk
itzutz		tsekin	chu		squash, gourd
kahratani	ndaka	deka	dahu	nakaha	to sweep
kakuche	kuti				jar, jug
kamakuni	kuinu	dikuina	hua		to end, finish
kanihtakua	taa				handle
kanikukua	ngundi				arch, bow
karahpeni	kanchee				to trick, fool
karichani	kan	nakokan			to be thirsty
karinga	kuiku				hunger
karisi		tseka			dry
keni	kaa	gowa			to climb, go up
kitihkuni	tingine	getinna			to wipe
kuahta		wa(gua)			house
kuaratzeni		nindeko	taritzinga		to fall
kuatani	kunendai	dekena			to watch
kuatzini	kanda	gatei	tsuhua		to empty one's stomach
kui		kesa	kundua		bird
kuitse	kuu	ketzu	kunyee		snake
kunantani	kunditu	tokona			to bend over

kurinda	tundu				bread
kurini	nguichi				to burn (intr)
kurrungekua	kianu				shirt
kurucha	yaka	ketska	kuchee		fish
kushareti	ku	kunrri			?
kusharetu		tzasku			woman
kutsi			kunitachau		moon
kutsikua		tsuanki	dantsua		ear
kutsiti		tsuhu	kuchia		hen
kutzari	ngubndubi	tzutei	yise	yotruu	sand
kuuini	kiadu	gatzo			to sleep
kuyame	kunuyuni				pig, animal
mikani	nangadi	tzuku			to close, shut
mitztu		chumi	kumistu		cat
mukutzatani		ketiena	dantzebghui, dantzengui		to pull up, uproot
pakanguhpeni	kangunda	diketia			to push
patamu	kuatuu	dahana			to chew
patsirani		stsitsina			
piuakuareni	kuai		kueee		to buy
shanaku		ketsu			lizard
shangarani	kunuyuni	goka			to walk
shanu	chanu	tsukunde			wild boar
shapitu	kusrhunda				prawn
shengua	nguaa	tesoshiu, tesokoshiu			cherry
shurata	tsuma		shishia		cotton
sikuame	chingatu	tzakandua			witch, wizard
sikuapu		tsiunkui			spider
sini		tsinon			tooth
sirauata		tsiunkui			smoke
siriku	iku				ant
situri		tsiya			tripe, intestines
tareni	kundu	gata			to work the land
tariyata		ndie	trindu		air
tatzikua	natai	mitzou			altar
tauas		ysou	tuhuana		liver
temben	nidichi		tee		ten
tiripani	tundiku	tsindskete			to stick
tsarakua		tsue			rush mat
tsihnereti	tsan		kushii		male
tsikanarini	ndikuatu	dokutiena			to fold
tskapu		tsoho	shru		rock, stone
tuhuatani		guhundandio	tenhidata		to spit
turiri	ndukia	tchuu, nton			ember, coal
tziuireni		tseka			pine, pine tree
undahpeni	nditan	getitia			to attack
utukshkuchunda	itidutu	tichinta			snail
vihtsiri		tsoo			flea

vingaringa	nguaku		to cover, wrap
virutzi		tsishki	skull
yauani	yakua	ndukua	poor
yuchani	kundamba	goke	to enter
yurekua	iku		flea

Appendix B: Liedtke's (1997) list of Purepecha-Quechua (Q)-Aymara (A) cognates

Purepecha	SPC Tarma Q	Ayacucho Q	Huaylas Q	Cuzco Q	Apurimac Q	Imbabura Q
caka-caka-ra-nto	čaqa					
čar-a		čall-u (lit. 'to crack, shatter; cracked, shattered of small or thin things)	call-u (lit. 'to shatter')	čhall-u (to break')		
ciki-		čik-lli- ('to sprout after having been cut')				
cir-a		čir-i (cold, be cold; make cold (weather), feel cold, feel a chill)				
chir-a, chir-i (to coagulate, congeal), chiri-chiri-ngari- (to tremble all over as if from chill)		čir-ya (bcome cold, freeze with fright)			čir-ya- (become cold, freeze with fright)	čiri ('cold; alpa highland')
čur-i-ngari	čuru (ice, be congeal ed, to freeze)		curu- (to freeze, Ancash)			

cur-a, cur-e, cor-a, chor-e; cure-n-cure-ru		čull-i (cold, catarrh); čull-u (to melt), čullu-llu-llu (to give off water in various spots, to run (of cores))	č'ull-i (cold, catarrh)
čut-i- (čot-o- 'to lack a point or normal prominence')		čutu (shrt)	
čupí-ri			
tiri-tiri-ndi, tiri-pu-ra (to ripn, of maize), tiri-pu (yellow cabbage), tiri-pe-ti (gold), tir-u-ngari (yellow of face)	tiri (yellow)		
tir-i-ma	tir-a- (to pull out)		t'ir-a (pull out with the root)
tis-i-; tisi-me (to be bearded), tisi-me-kwa (beard), tisi-ru-kwa (nostril hair), tisi-tisi-ra-s (hairy, woolly)		tis-a (to comb wool)	

tuku-		tuku- (also come to an end, be finished); tuku-q (ending, finale)		
tukuri, tukuru Uhu		tuku (kind of large owl)	tukuru	
thuru-me; thuru-me-nte-ni (puddle, dirty place), thuru-me-not (spongy place)			t'uru (clay, mud, dirt)	
ti-, -ndi-(ra)-		ti (body aperture)		muki-ti (fist)
phaka-a-	paka- (also treasure, hidden money)	paka		
phuku-	puq-ri (be overripe)	puqu- (also mature); puqu-y (maturation, rainy season), puquy-puquy (well-matured, robust)		
phir-(i-)	pil-qu (to curl oneself up, to coil up)		phiru-ru (whorl)	

pis-pis-a-ngari		pis-i- (to diminish, run out); pisi-pa- (to tire), pisi-pay (very tired)				
pure-	puri-š (gadab out, ambula tory); puri-kuna (road, path)	puri- (to walk, travel,wal k through, wander, roam)	puri- (also Ancash 'to run')			
puru-a-		pull-pull-ya (make the sound of boiling)				
puru-	puru (gourd, calabas h)	puru, poro (gourd), ispay puru (bladder), puru-puru (grnadilla) , pula (typ of gourd dish)	puru (also Ancash, type of calabash vessel)	poro (gourd mate, vase made of a type of calabash)		išpa puru (bladder)
ka		ka-				
kara-h-pi-ngari; kara-h-pi-ni (become inflamd, as of a boil)				k'ara (to feel or cause burning pain), k'ara-q (burning , painful, sharp, biting)		
kaka-, kaka-ta (to break fallow soil with a plough)	kaka- (to cut open the throat of a freshly killed					

	hen)		
kar-a-ce-ti			kari, qari (be tired)
karo-hpa-			
karu- (aru- 'to divide, partition)		qaru- (of utensils)	
kaca-		qača (dirty, sloppy, scabby, messy)	
kac-a-	kac-u- (also to chew)		khač-u (also Collao, to eat, chew semidried fruits)
kit-i-			qhit-u-
khunču-		uñču- (to contract the limbs, squat awkwardly)	
kuru-		kuru- (to wind up, as of thread or yarn), kuru-ra (wind into a ball), kuru-r (ball of wool)	
kuru-hku		quru (clipped, with the end cut off)	

kur-u-kwa-ro	kur-pa (fallowed earth)	kur-pa (mud ball, lump of earth)		
kuna-kwa (also kun-a- 'to swallow')		kun-ka (also neck)		
kutu-	qutu (tumour in the neck; pile, heap, also qutu- to pile up)	qutu (goitre)	q'oto (swelling in the neck, goitre, adenoma, bird goitre)	kutu (Adam's apple)
kutu-		kutu (to cut off at th base), kutu- (also to shorten by cutting)		
nin-i-		nin-a- (fire, flame)		
sir-i-ku-ni		sir-a-	sir-a-	
sɨpi-		supi- to fart		
šu-		susu-n (unripe, at preripe stage, be picked to ripen at home)		
šuku-	šuku-pa (hood), šuku-ta (headshawl), šuku-ku (to wrap one's head)	suku- (to cover), suka-ta (veil)		

war-u-, war-o-				wall-u- (to cut into pieces, cut up)
waš-a- (also waša-nci-ku 'seat, chair')		was-i (house)	was-i (house)	
wik-i-šu	wik-ru, wiq-ru (twistd, crooked)	wik-su (crooked, bent, inclind, tilted)		
hi	dashhi-			
hawa-		hawa (top)		
hata-		hata-ri (to gt up, rise)		
huku-mbi-ta-		huk (one another), huk-ni-n (the other, add, mix, join, unite)		
upa-ce		upa-ku- (to wash one's face)		
ure-, ore-				uri (premature)
dashmara-		malli- (also to try (out))		
mati-				mat'i (to push, squeeze, tweak)
dashmu	mutu (bud)	mut-mu (bd)	kut-mu- (cut with teeth)	

muru- muru-mi				murru-s murru-s (ideophone, sound of eating toasted corn or any hard food)
a-		aku- (to chew, chew coca), amu- (hold in the mouth)		
aša-	a◦ša (to open the mouth widely, to yawn), a◦ša-ka (with open mouth)			

Purepecha	Boliv/ Ecuad Q	Tarma Q	Cajamarca Q	Ayma ra	Jaqaru	La Paz	Huanca
chir-a, chir-i (to coagulate, congeal), chiri-chiri-ngari- (to tremble all over as if from chill)	čiri ('cold')						
čur-i-ngari	čull-u (ice, to be freezing)						
cur-a, cur-e, cor-a, chor-e; cure-n-cure-ru		čul-ba (to wash, winse, wet one's face); čul-ču (to drip, sweat)					
čupí-ri			čupi-ka (red)	čupi-ka (red)	mila-ka (red)		
tis-i-; tisi-me (to be bearded), tisi-me-kwa (beard), tisi-ru-kwa (nostril hair), tisi-tisi-ra-s (hairy, woolly)	tis-a (to comb wool)						
tuku-	tuku- (Bol. only)						

phaka-a-	paka (Ec., secret, occult), paka- (Bol.)				
phar-a (also phara-ku- to twist or roll tight)	phar-i- (roll, turn, twist thread)				
pat- (e.g. in pat-u-khu to have a scratch on one's hand)				phat-a (to burst, break open)	
piču-		picu- (also to decompose, fall apart)			
phir-(i-)	pillu- (Ecuad. 'to wrap'), pilu-ri (to curl)	pil-ta- (to braid, plait)			pilu-lu (whorl)
pure-	puri- (Bol. to walk, travel, walk through, wander, roam)	puri (to walk (about))			puli- (also Junin 'to go')
puru-a-		pul-ya- (to bubble, of boiling water)			

puru-		puru (gourd, calabash)		
ka	ka-			
dashka	dashka (Bol., if)			
karo-hpa-	karu- (to dig)			
kac-a-		kac-u- (also to chew)		
kumpu-	qhompu (Bol.)			
kuru-hku	qhoro (mutilated)			
kur-u-kwa-ro	k'ur-pa (clod of earth)	kur-ba (clod, lump of earth)		
kuna-kwa (also kun-a- 'to swallow')	kun-ka (Bol., also neck)			
kutu-	k'utu- (cut with scissors or scythe)	kutu- (to cut)		k'utu- (also Cochabamba, to cut a tree, with scissors)

šuku-		šuku-ta (head shawl), šuku-či (to adorn the head of the deceased)
war-u-, war-o-		wal-a- (to cut meat into strips)
waš-a- (also waša-nci-ku 'seat, chair')	was-i (Ecuad., house)	
wik-i-šu		wiq-lu-š (crooked, deformed of hand)
huku-mbi-ta-		huk-ni-ki (your partner), huk-la-pa- (unite)
dashmara-	malli- (Ecuad. also to try a mouthful)	
mati-	mat'i (Bol., tight, squeezed)	
dashmu		muu (bud)

aša-	a◦ša (to open the mouth widely, to yawn), a◦ša-ka (with open mouth)

Appendix C: Greenberg's (1987) cognates for Purepecha ('Tarascan')

Word	Tarascan	Cuitlatec	Lenca				
			Intibucat	Chilanga	Opatoro	Similaton	Guajiquero
bite	ara	eʔla					
black[1]	vera-(dark)	puluši-li, puruši					
boy	ača (child)	ču, čuʔu					
burn[1]	tʰiri	tul(-wakaši) (dried beef, or burn-cow)					
burn[2]	čuhpi, čpʰi-ri	čibe					
chest	teru(nhe-kua)	ixtaloja					thala (neck)
ear[2]	kutˢu-kwa	kuhčidi					
far	io-(high, long)	jo, jaj-					
fire	kata (firewood)	kuhtə (also light)					
flower	tˢitˢi	tuxtu, tutul					
hole	poro (cave)	palałeli					
laugh	erhe-			jolo-			
mosquito	tˢiri (wasp)	čile, šilga (wasp)					sira (bee)
old	thare-p-ti						toolo (old man)
one	to(-mu)						etta
say	aj-(inform, tell)	e		aj(-on)			
skin	čes	kuti					

strong	atie-ti (hard)	ahte (be able)					
sun	kut^si (moon)					kaši	kaši
tail	theta(-kwa) (buttocks)	dihta					
urine	jaz(ka-ta)	wɨlɨ					
water[1]	dashma- (action on water)	ʔumə					
yellow	šunga-peti, šušungas (green)			šuninga			
wash	t^sika (rub)			$t^{sʔ}$ik		sagi	
cold	t^sira			$t^{sʔ}$ana		sani (freeze)	
deer	axuni (also animal)			a$k^ʔ$uan	ahuingee	aguingge	ahuingee
earth	at^sɨmo (mud)	ixtame, tamelo (field)					
liver (some forms may be borrowed from Spanish pecho)	mint^si-ta (heart)			mut^su-na			
large	era-hka-ta (tall)	iwili					
3sg	i- (this, that, he)	i- (def art)		i(-no), i- (indef obj), i:- (3sgposs & obl			i(-na)
past tense suffix	š-			aš			

Total 'cognates'	68	22	0	9	1	4	7
Total/family	**68**	**22**	**21**				

Word	**Tarascan**	**Nuclear Chibchan**				
		Antioquia	**Aruak**			
		Nutabe	**Kagaba**	**Guamaca**	**Bintucua**	**Atanque**
ear[2]	kutˢu-kwa		kuka	kukua, kuhkua		kukkua
earth[1]	ketˢe-kwa (under)				kasi(-k) (under)	
earth[2]	viras (white earth)			auariga (under)		avarin (under)
mosquito	tˢiri (wasp)		sungulu	tun	čun	
old man	tama-pu	tobe				
rain	emen-da (rainy season)		ni-mue (rainy season)		manje (storm)	
say	aj- (inform, tell)				j(-an)	
skin	čes				kutiru	
sleep	kuvi-kua		kaba		kama	
urine	jaz(ka-ta)		wisi			
water[2]	juri-ri (blood)	ni	ni		ria (liquid)	
wing	ak(-s-kua)		gekala (also fin)			
wash	tˢika (rub)		ižukue (clean)		ačukua	
cold	tˢira			seanximi		
come[1]	dashno-		na, nai, nei (go)			
earth	atˢimo (mud)					simoru (sweepings)
burn[2]	apare		pula			

liver (some forms may be borrowed from Spanish pecho)	mint^{s}i-ta (heart)			pešu (chest)		pešu (chest)
large	era-hka-ta (tall)				vari-n (high)	
many	vini-ni (be full)			bini		
yellow	t^{s}ipan-be-ti			tamukueg a		
3sg	i- (this, that, he)			i- (3sg.poss)		
Total 'cognates'	68	2	10	8	9	4
Total/family	**68**	**2**	**31**			

Word	**Tarascan**	**Chibcha**					
		Chibcha	**Uncasica**	**Tunebo**	**Tegria**	**Sinsiga**	**Duit**
boy	ača (child)	ča (male)					
cook[1]	nini-rha-ni		ani (to boil), anina (cooked)		ani(-ndro)		
cover	šuku-ta-hpe-ni			teka-ra (poncho)			
earth[1]	ket^{s}e-kwa (under)	guanza					
elbow	kukui-si				kuika (arm)	kuika (arm)	
name	het^{s}(-nga-rha-qua)	[hyca]					
old man	tama-pu	tiba-ra, tiba-ča					
one	to(-mu)	ata, yta (hand)			at-uba (finger)		atia
sleep	kuvi-kua	[quyby]			kamaria		
strong	atie-ti (hard)				te(-kro) (brave)		

urine	jaz(ka-ta)	[hysu]					
water²	juri-ri (blood)		li		ria, lia		
wing	ak(-s-kua)	gaka					
wash	tˢika (rub)				suka- (bathe), suk-ro (bath)		
cold	tˢira				sero		
earth	atˢimo (mud)	tum (mud)	tamara (mud)		tami (mud)		
yellow	tˢipan-be-ti	tib-	tamo-ja		tam-airo		
3sg	i- (this, that, he)	i- (indef obj & gen'izer)					
Total 'cognates'	68	12	4	1	10	1	1

Word	**Tarascan**	**Chibcha**				
		Manare	**Margua**	**Tairona**	**Pedraza**	**Boncota**
ear²	kutˢu-kwa		kugexio		kukača	kukasa
elbow	kukui-si	kuika (arm)				kuika (arm)
name	hetˢ(-nga-rha-qua)		aka			
rope	sira(-ngua)	čita-ra				
sleep	kuvi-kua					kamaja
touch	katˢi (squeeze)					kato
urine	jaz(ka-ta)	jisa				

water[2]	juri-ri (blood)	ria	dia	dia	dia	ria
cold	tˢira				seroa	
earth	atˢimo (mud)		tabo-ra			
burn[1]	ete, tˢ(-ku-ni; set on fire)					etera (fire a weapon)
die	ahpe (kill)	paja-gui (kill)				
liver (some forms may be borrowed from Spanish pecho)	mintˢi-ta (heart)	pučira (belly)				beča (chest)
water	itˢi		dia			ria
Total 'cognates'	68	6	5	1	3	8
Total/family	**68**	**52**				

Word	**Tarascan**	**Cuna**		**Guaymi**				
		Cueva	**Cuna**	**Move**	**Changuena**	**Chumulu**	**Gualaca**	**Muoi**
black[1]	vera- (dark)		polea (be dark)					
black[2]	tuli (also charcoal)			tra, tro				
burn[2]	čuhpi, čpʰi-ri					kba (fire)		
cook[1]	nini-rha-ni			ñio(-kwa) (fire)				

cover	šuku-ta-hpe-ni		tukusii (to be hidden)					
dance	vara-ni							ubra
ear[2]	kutˢu-kwa					kuga	kuga	
earth[2]	viras (white earth)							ubar (sand)
flower	tˢitˢi		tutu					
laugh	erhe-		ale-					
live	tˢi(-pe)		sii (sit, be)					
mosquito	tˢiri (wasp)				suerit	siiru (fly)		
name	hetˢ(-nga-rha-qua)			ko				
old	thare-p-ti		sele, sere			tare	tare	
old man	tama-pu	tiba (king)						
one	to(-mu)			dashti				
push	phaka		pike					
skin	čes			kuata				
sleep	kuvi-kua		kape				kabi-gal	
strong	atie-ti (hard)			di (strength)				
water[2]	juri-ri (blood)			dashri, -li, -ni (liquid)			ti	
wing	ak(-s-kua)					kek		
come[1]	dashno-		noni, nene, nae (go)					

earth	atˢimo (mud)			thobo		savi-ru		
die	ahpe (kill)		ipjoa (kill)					
shin	dashkari- (incorporated)			ngurie				
large	era-hka-ta (tall)		wili (deep)					
many	vini-ni (be full)		pule, pelo (all)					
3sg	i- (this, that, he)		i- (indef obj)	ja				ja
Total 'cognates'	68	1	13	10	1	6	5	3

Word	**Tarascan**	**Nuclear Chibchan**					**Malibu**
		Murire	**Guaymi**	**Norteño**	**Sabanero**	**Penomeño**	**Chimila**
bite	ara						erau
cook[1]	nini-rha-ni			ñio(-kwa)			
dance	vara-ni			prare (n.)		prare (n.)	
ear[2]	kutˢu-kwa						kutˢa(-kra), kuusu)-ka), kutˢaka (hear)
name	hetˢ(-nga-rha-qua)						kaka (to be called)
old	thare-p-ti			turua (grandfather)		turua (grandfather)	

one	to(-mu)						aatta-kra (hand)
sleep	kuvi-kua				gabede		
strong	atie-ti (hard)						taje
yellow	šunga-peti, šušungas (green)						sunsuru (green)
wash	tˢika (rub)						
cold	tˢira						sohnikote
come[1]	dashno-						noŋ
earth	atˢimo (mud)				debbi		
many	vini-ni (be full)						muni (abound)
water	itˢi	či					
3sg	i- (this, that, he)	ja	ja				
past tense suffix	š-						
Total 'cognates'	68	2	1	3	2	2	9
Total/ family	**68**	**35**					**9**

Word	**Tarascan**	**Misumalpan**					
		Sumu	**Cacaopera**	**Miskito**	**Tawaska**	**Ulua**	**Matagalpa**
belly	va- (inside)	ba				ba	pu
black[1]	vera- (dark)					bara	
cover	šuku-ta-hpe-ni	sakawaki (hide)					

mosquito	tˢiri (wasp)			tairri			
old	thare-p-ti			tara (large)			
old man	tama-pu			dama (grandfather)			
see	mi, miu (also count)		bi				
skin	čes		kˀuta				
sun	kutˢi (moon)			kati (moon)			
urine	jaz(ka-ta)	usu		is(-ka)		usu	
water[2]	juri-ri (blood)		li	li			li
woman	uarhi-ti	jal (also female)	jora				
yellow	šunga-peti, šušungas (green)				sang-ni (green)		
wash	tˢika (rub)		saka	sik			
cold	tˢira	sang (cold weather)					
shin	dashkari-(incorporated)	kal				kal	

liver (some forms may be borrowed from Spanish pecho)	mint^{s}i-ta (heart)	pas (chest)					
many	vini-ni (be full)			bani (each)			
water	it^{s}i		li	li, laja			li
Total 'cognates'	68	7	6	9	1	4	3
Total/family	**68**	**30**					

Word	**Tarascan**	**Motilon**			**Rama**		
		Dobocubi	**Motilon**	**Barira**	**Rama**	**Guatuso, Guetar**	**Corobisi**
cover	šuku-ta-hpe-ni				al-taku-ai (be hidden)		
ear[1]	kurha-ngu-ni (hear)						kur (hear)
ear[2]	kut^{s}u-kwa			kut^{s}i-nje			
fire	kata (fire wood)	kadø					
laugh	erhe-	aru					

name	hetˢ(-nga-rha-qua)				ak		
one	to(-mu)	atu (finger)					
rope	sira(-ngua)		sita (belt, liana)		sira (thread)		
sleep	kuvi-kua	koba			kami		
water[2]	juri-ri (blood)				ari (liquid)		
wash	tˢika (rub)				suki		
cold	tˢira	tero(-kwa)					
earth	atˢimo (mud)	atan, atam (bad)		atan, atam (bad)			
many	vini-ni (be full)				bain		bain
water	itˢi					ti	
worm	karha-si					karan (Guatuso)	
3sg	i- (this, that, he)				i, ja (also 3sgposs)	i (also prefixed possessive)	
Total 'cognates'	68	7	1	2	8	3	2
Total/family	**68**	**10**			**13**		

Word	Tarascan	Talamanca						Paya
		Terraba	Tirub	Bribri	Cabecar	Chiripo	Boruca	Paya
belly	va-(inside)	bu(-wo)						
black[2]	tuli (also charcoal)			doro roi		dorona	turinat	tersu (Negro)
ear[2]	kutˢu-kwa		kuzung (hear)					
earth[1]	ketˢe-kwa (under)					kaša		
elbow	kukui-si							koki sa (knee)
hole	poro (cave)	fre (cave)						
live	tˢi(-pe)	se	si					
mosquito	tˢiri (wasp)	serung (fly)					serung (fly)	
name	hetˢ(-nga-rha-qua)	ko						
old	thare-p-ti	ter (grandmother)	ter (grandmother)		dabai (father-in-law)			
one	to(-mu)			et				as
rain	emen-da (rainy season)				mo			

rope	sira(-ngua)	(kor-)sreng (root, kor = tree)	seren					
skin	čes	kwota	kwota					
sleep	kuvi-kua			kipu		kpu		
urine	jaz(ka-ta)						wiš(-ku)	
water[2]	juri-ri (blood)	ti		di				uri (blood)
wing	ak(-s-kua)						ika	
woman	uarhi-ti	ware						
cold	tˢira	sen					tˢaara (be cold)	sainista (be cold)
earth	atˢimo (mud)				tamã (dirty)		tap	
large	era-hka-ta (tall)							uruha (deep)
many	vini-ni (be full)		pir(-kru) (all)					
water	itˢi	ti, di	di					tia
3sg	i- (this, that, he)			i- (3sg poss)			i, iæ, j- (3sgposs)	
past tense suffix	š-							
Total 'cognates'	68	12	7	5	3	3	7	7
Total/ family	**68**	**37**						**7**

Word	Tarascan	Xinca			
		Yupultepec	Chiquimulilla	Sinacatan	Xinca
burn[1]	tʰiri				tala, tarała (to toast)
chest	teru(nhe-kua)	tałi	tałi		
live	tˢi(-pe)	iši			
wing	ak(-s-kua)	kaha			
woman	uarhi-ti		ajal	ajala	
cold	tˢira		sarara		sarałtˢi (to cool), sarara (frost)
large	era-hka-ta (tall)	ura			
day	piri-tani (lighten), piri-rasi (luminous)	pari (also sun)	pari (also sun)		
2sg	sdashke(-ni) (1sg acts on 2sg)				(na-)ka, ka- (2sg possessive)
Total 'cognates'	68	5	4	1	3
Total/family	**68**	**13**			

Word	Tarascan	Yanoama				
		Sanema	Shiriana	Yanam	Yanomamï	Yanoam, Yanomam
burn[2]	čuhpi, čpʰi-ri	tˢopi, čɔɔbi (hot)				
cook[2]	hiri					hari
dance	vara-ni					praia
rain	emen-da (rainy season)	maa				maa
rope	sira(-ngua)				ašitʰa	

see	mi, miu (also count)	mɨ				mɨ
skin	čes			kasi	kasi	kasi
wash	tˢika (rub)	tikukai				
cold	tˢira			sãi		sãi (Yanomam)
earth	atˢimo (mud)		čami (mud)			
burn[2]	apare				fraa	
liver (some forms may be borrowed from Spanish pecho)	mintˢi-ta (heart)	amokɨ			amokɨ	amok
many	vini-ni (be full)				prəwa (large)	prəwa (large)
Total 'cognates'	68	5	1	2	5	8
Total/family	**68**	**21**				

Word	**Tarascan**	**Allentiac**		**Atacama**	**Betoi**	**Chimu**		
		Millcayac	**Allentiac**	**Atacama**	**Betoi**	**Chimu**	**Mochica**	**Eten**
bite	ara					rr(-an)		
boy	ača (child)							čoh (also child)
burn[2]	čuhpi, čpʰi-ri		čaps			xllep		
chest	teru(nhe-kua)					axtærr		
come[1]	pe- (do while coming)		pe (future)					
cook[1]	nini-rha-ni							nin (also boil)
fire	kata (firewood)	ketek						

hole	poro (cave)		huru (door)					
laugh	erhe-	alau						
mosquito	tˢiri (wasp)							sinu, senu
name	hetˢ(-nga-rha-qua)							ok
old man	tama-pu		tomal					
see	mi, miu (also count)			mini				
skin	čes			kˀati				
sleep	kuvi-kua			kˀip-ti (bed)				
sun	kutˢi (moon)							kæss
water[2]	juri-ri (blood)			(pu-)ri, (la-)ri (blood)				
wash	tˢika (rub)		čok	čˀekˀati-n, čˀekˀu-n (baptize)				tˢuk (clean)
cold	tˢira			sera-r				tˢan
come[1]	dashno-		neñ (road)					
earth	atˢimo (mud)				dafi-bu		tum (mud)	tuno (muddy)
liver (some forms may be borrowed from Spanish pecho)	mintˢi-ta (heart)	počok (belly)						počak
many	vini-ni (be full)							men (to swell)
yellow	tˢipan-be-ti							tˢa:m
3sg	i- (this, that, he)			ia, i- (3sgpossss)				

with ('sociative' affix)	pi- (to be joined, together, similar), pipi, pire (man's older brother)		p- (kin term prefix)			p- (kin term prefix)	p- (kin term prefix; Yunca)	
Total 'cognates'	68	4	8	7	1	4	2	11
Total/family	**68**	**12**		**7**	**1**	**17**		

Word	**Tarascan**	**Itonama**	**Jirajira**			**Mura**	
		Itonama	**Ayoman**	**Gayon**	**Jirajira**	**Matanawi**	**Mura**
black[1]	vera- (dark)	bola (shadow)					
black[2]	tuli (also charcoal)					torupi (shadow)	
dance	vara-ni				prarara (n.)		
earth[1]	ket^{s}e-kwa (under)	kus- (down, v. prefix)					
earth[2]	viras (white earth)						bere
live	t^{s}i(-pe)	si (be)					
old man	tama-pu		tum				
shoulder	pešo	paču-kaka, ux-pača-čano (your upper back)					
earth	at^{s}imo (mud)		dap	dap	dap		
burn[2]	apare	ubari (fire)					

liver (some forms may be borrowed from Spanish pecho)	mint^{s}i-ta (heart)		apox (belly)			miši-ta (heart)	
large	era-hka-ta (tall)						uri
many	vini-ni (be full)	amaniato					
yellow	t^{s}ipan-be-ti					tomã (blue)	
3sg	i- (this, that, he)	i- (unspecified obj)					
nominalizer (suffixes if no dash indicated)	ni	na, ne					
past tense suffix	š-						
Total 'cognates'	68	8	3	1	2	3	2
Total/family	**68**	**8**	**6**			**5**	

Word	**Tarascan**	**Mura**	**Andaqui**	**Barbacoa**			
				Cayapa	**Colorado**	**Cara**	**Cuaiquer**
belly	va- (inside)			bi	bi		
burn[2]	čuhpi, čp^{h}i-ri				čiba-na, čiba-ge (heat)		
come[1]	pe- (do while coming)	abe (let's go)			fua (arrive)		
cook[1]	nini-rha-ni			ni (fire)	nija (burn), ni (fire)		
ear[1]	kurha-ngu-ni (hear)						kail

earth[2]	viras (white earth)					bual a (fiel d)	piʎ [pill]
hole	poro (cave)			horo	foro		
mosquito	tˢiri (wasp)		tunihi	tanda (bee)	čina (bee)		
rope	sira(-ngua)				čili, sili		
see	mi, miu (also count)			mi	mi (knowledge, learn)		
shoulder	pešo		[fasziyunichini] (back)		behči (back)		
skin	čes			kido	kido		
sleep	kuvi-kua			kepe (night), kapi-ana (be sleping)			
come[1]	dashno-				nena (walk)		
earth	atˢimo (mud)			tumajii (dirty)			
die	ahpe (kill)			pe, peja	pu(-jae)		
liver (some forms may be borrowed from Spanish pecho)	mintˢi-ta (heart)			pešu (stomach)			
many	vini-ni (be full)				man		
3sg	i- (this, that, he)			ja			

with ('sociative' affix)	pi- (to be joined, together, similar), pipi, pire (man's older brother)				pe- (also in the company of)		
nominalizer (suffixes if no dash indicated)	ni			nu			
Total 'cognates'	68	1	2	13	14	1	2
Total/family	**68**	**1**	**2**	**30**			

Word	**Tarascan**	**Choco**				
		Catio	**Citara**	**Tucura**	**Chami**	**Nonama**
belly	va- (inside)	bi	bi	bi		
black[2]	tuli (also charcoal)				tauri (shadow)	
ear[1]	kurha-ngu-ni (hear)				guru	
ear[2]	kut^{s}u-kwa					katji
old man	tama-pu					tumbela (large)
sleep	kuvi-kua	kebu-ra			kaimbej (lie down)	
urine	jaz(ka-ta)	sia (urinate)				
wash	t^{s}ika (rub)	sygyja				
cold	t^{s}ira					
come[1]	dashno-	nenu				
earth	at^{s}imo (mud)	tumia (devil)				
die	ahpe (kill)				piuee	
many	vini-ni (be full)	bari (grow)				
water	it^{s}i					
worm	karha-si					

day	piri-tani (lighten), piri-rasi (luminous)		ibare			
Total 'cognates'	68	7	2	1	4	2

Word	**Tarascan**	**Choco**			**Paez**			
		Waunana	**Saija**	**Sambu**	**Paez**	**Moguex**	**Totoro**	**Guambiana**
boy	ača (child)				učᵘ (small)			
burn[2]	čuhpi, čpʰi-ri				šaßʲ (burn onself)			
come[1]	pe- (do while coming)				pa (arrive)			pu (arrive)
cook[1]	nini-rha-ni							nenin (working)
ear[1]	kurha-ngu-ni (hear)	kuru		kuru	kalo	kalo	kalo	kalo
earth[2]	viras (white earth)						pir-d	pire
old man	tama-pu				tẽẽ (adult)			
see	mi, miu (also count)				ßia (appear)			
woman	uarhi-ti	wara	wera	wara				
wash	tˢika (rub)				søkak (caress, knead)			
liver (some forms may be borrowed from Spanish pecho)	mintˢi-ta (heart)				meˀkʲ, meeki	mik-t (belly)		patˢe, pathe

large	era-hka-ta (tall)				wala	wala		
many	vini-ni (be full)							minu
day	piri-tani (lighten), piri-rasi (luminous)			ibaru (mouth)				
3sg	i- (this, that, he)				i (3pers obj)			
with ('sociative' affix)	pi- (to be joined, together, similar), pipi, pire (man's older brother)				pe- (duality, comitative)			
Total 'cognates'	68	3	1	3	14	4	2	6
Total/family	**68**	**23**			**26**			

Word	**Tarascan**	**Timucua**		**Warrau**	**Plateau Penutian**
		Tawasa	**Timucua**	**Warrau**	**Klamath**
come[1]	pe- (do while coming)		po(-no)		
ear[2]	kut^{s}u-kwa		okoto (hear)		
earth[1]	ket^{s}e-kwa (under)		[qisa]	kahu (underside)	
earth[2]	viras (white earth)		pile (field)		
hole	poro (cave)		pali (to open)		
mosquito	t^{s}iri (wasp)	čena (bee)			
old man	tama-pu			idamo	
one	to(-mu)			isa	

rope	sira(-ngua)			ahutu	
skin	čes		ukwata (body, flesh)		
touch	katˢi (squeeze)			kata (press)	
wash	tˢika (rub)			siko-, seke- (rub)	
cold	tˢira				
come[1]	dashno-			nao	
earth	atˢimo (mud)			hobo-to (also mud)	
liver (some forms may be borrowed from Spanish pecho)	mintˢi-ta (heart)			amahi	
large	era-hka-ta (tall)			wari	
many	vini-ni (be full)		mine (large)		
3sg	i- (this, that, he)			i (3pers obj)	
with ('sociative' affix)	pi- (to be joined, together, similar), pipi, pire (man's older brother)				p- (kinship term prefix; also found in Andean, Hokan and Penutian languages. The -n(V) derives infinitives and verbal nouns from verbal stems.)
Total 'cognates'	68	1	8	12	(1)
Total/family	**68**	**9**		**12**	(1)

Appendix D: Language sample and references for metallurgy study

Aymara	Deza Galindo, Juan Francisco. 1989. Diccionario Aymara-Castellano, Castellano-Aymara, Lima: Graphos 100 Editores.
Awa-Pit/Cuaiquer	Lehmann, Walther. 1920. Zentral-Amerika: Die Sprachen Zentral-Amerikas. (I.) Berlin: Dietrich Reimer. Curnow, Timothy Jowan. 1997. A grammar of Awa Pit (Cuaiquer): An indigenous language of south-western Colombia. University of Canberra. Canberra: Australian National University.
Barí	de Villamañán, Adolfo. 1975. Vocabulario barí comparado: Comparación de los vocabularios del Fr. Francisco de Catarroja (1730) y Fr. Francisco Javier Alfaro (1788) con el barí actual, Caracas: Editorial Arte. Rivet, Paul & Cesáreo de Armellada. 1950. Les Indiens Motilones, Journal de la Société des Américanistes 39: 15-58.
Bocotá/Buglere	Margery Peña, Enrique & Mariana Arias Rodríguez. 2005. Vocabulario español-bocotá, Lingüística Chibcha XXIV: 87-121.
Boruca	von Thiel, Bernhard August. 1886. Vocabularium der Sprachen der Boruca-, Terraba-. und Guatuso-Indianer in Costa Rica, Archiv für Antropologi, XVI Band. Quesada Pacheco, Miguel Angel & Carmen Rojas Chaves. 1999. Diccionario boruca-español, español-boruca, San José: Editorial de la Universidad de Costa Rica.
Bribri	Constenla Umaña, Adolfo, Feliciano Elizondo Figueroa & Francisco Pereira Mora. 1998. Curso básico de Bribri, San José: Editorial de la Universidad de Costa Rica. Gabb, William M. 1875. On the Indian Tribes and Languages of Costa Rica, Proceedings of the American Philosophical Society, 14(95): 483-602.

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Cabécar	Arroyo, Víctor Manuel. 1972. Lenguas indígenas costarricenses, San José: Editorial Universitaria Centroamericana (EDUCA). Margery, Enrique. 1989. Diccionario Cabécar-Español, Español-Cabécar, San José: Editorial de la Universidad de Costa Rica. Gabb, William M. 1875. On the Indian Tribes and Languages of Costa Rica, Proceedings of the American Philosophical Society, 14(95): 483-602.
Catacaos	Loukotka, Cestmír. 1949. Sur quelques langues inconnues de l'Amérique du Sud. Lingua Posnaniensis I. 53-82.
Changuena	Pinart, Alphonse L. 1890. Diccionario castellano-dorasque, dialectos Chumulu, Gualaca y Changuina, Paris: Ernest Leroux.
Chapalaa/Cayapa	Lindskoog, John N. 1964. Vocabulario cayapa, compilado. Serie de vocabularios indígenas, Mariano Silva y Aceves (ed.) núm. 9., México D.F.: Summer Institute of Linguistics.
Chibcha/Muisca	González de Pérez, María Stella. 1987. Diccionario y Gramática Chibcha: Manuscrito Anónimo de la Biblioteca Nacional de Colombia, Yerbabuena: Instituto Caro y Cuervo. Acosta Ortegon, Joaquin. 1938. El Idioma Chibcha: Aborigen de Cundinamarca, Bogotá: Imprenta del Departamento. Quesada Pacheco, Miguel Angel. 1991. El vocabulario mosco de 1612, Lingúïstica Chibcha 10: 29-99. Uricoechea, Ezekiel. 1871. Gramática, Vocabulario, Catecismo y Confesionario de la lengua Chibcha, Paris: Maisonneuve.
Chichimeca Jonaz	Lastra, Yolanda. 2009.Vocabulario piloto Chichimeco, México, D.F: Universidad Autónoma de México, Instituto de Investigaciones Antropólogicas.

	Soustelle, Jacques. 1951. Documents sur les langages Pame et Jonaz du Mexique central (Hidalgo, Querétaro, San Luis Potosí), Journal de la Société des Américanistes 40: 1-20.
Chimila	Trillos Amaya, María. 1996. Categorías gramaticales del Ette Taara, Lengua de los chimilas, Bogotá: Editorial Artes Ltda. Celedón, Rafael. 1968 [1886]. Gramatica de la lengua Köggaba con Vocabularios y Catecismos, Nendeln/Liechtenstein: Kraus Reprint. Lehmann, Walther. 1920. Zentral-Amerika: Die Sprachen Zentral-Amerikas. (I.) Berlin: Dietrich Reimer.
Chiriguano	Wolf Dietrich. 2015 [2007]. Chiriguano dictionary. In: Key, Mary Ritchie & Comrie, Bernard (eds.) The Intercontinental Dictionary Series. Leipzig: Max Planck Institute for Evolutionary Anthropology. (Available online at http://ids.clld.org/contributions/289, Accessed on 2016-09-19.)
Cholón	Alexander-Bakkerus, Astrid. 2005. Eighteenth-Century Cholón, Utrecht: LOT
Classical Aymara	Bertonio, Ludovico. 2005, 2006 [1612]. Vocabulario de la Lengua Aymara, Arequipa: Ediciones El Lector.
Classical Huastec	Zenteno, Carlos de Tapia. 1975 [1767]. Noticia de la Lengua Huasteca, Heppenheim: Franz Wolf. de Quirós, Seberino Bernardo. 2013 [1711]. Arte y vocabulario del idioma huasteco, Edición crítica con anotaciones filológicas de Bernhard Hurch, México D.F.: Bonilla Artigas Editores S.A. de C.V.
Classical Kaqchikel	Coto, Tomás de, Fray. 1983. Thesaurus Verboru: Vocabulario de la lengua cakchiquel v[el] guatemalteca, nuevamente hecho y recopilado con sumo estudio, trabajo y erudición, México: Universidad Nacional Autónoma de México.
Classical Nahuatl	Molina, Fray Alonso de. 1966 [1571]. Vocabulario Nahuatl-Castellano, Castellano-Nahuatl, México D.F.: Ediciones

	Colofon S. A. de Arenas, Pedro. 1982 [1661]. Vocabulario Manual de las Lenguas Castellana y Mexicana, México: Universidad Nacional Autónoma de México. Soriano, Fr. Juan Guadalupe. 2012. Tratado del arte y unión de los idiomas Otomí y Pame; Vocabularios de los idiomas Pame, Otomí, Mexicano y Jonaz, paleografiado y editado por Yolanda Lastra, México, D.F.: Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México.
Classical Quechua	González Holguin, Diego. 1989 [1605]. Vocabvlario de la Lengva General de todo el Perv llamada Lengua Qquichua o del Inca, Edición facsimilar de la versión de 1952, Incluye addenda, Lima: Universidad Nacional Mayor de San Marcos
Cofán	Loukotka, Cestmír. 1949. Sur quelques langues inconnues de l'Amérique du Sud. Lingua Posnaniensis I. 53-82
Colorado/Tsafiki	Buchwald, Otto von. 1908. Vocabular der Colorados von Ecuador, Zeitschrift für Ethnologie, 40:70-82. Moore, Bruce R. 1979. Método para aprender el idioma colorado, Quito: Instituto Lingüístico de Verano bajo convenio con el Ministerio de Educación y Cultura del Ecuador. Dickinson, Connie. 2002. Complex Predicates in Tsafiki, PhD Thesis: University of Oregon. Moore, Brice R. 1966. Diccionario castellano-colorado, colorado-castellano, Quito: Instituto Lingüístico de Verano.
Cora	McMahon, Ambrosio & Aiton de McMahon, María. 1959. Vocabulario Cora (Cora y Español), México D.F.: Instituto Lingüístico de Verano. Preuss, K. Th. 1935. Wörterbuch Cora-Deutsch, International Journal of American Linguistics, 8(2): 81-102. Soustelle, Jacques. 1938. Un vocabulaire cora: Manuscrit inédit

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Damana (Guamaca)	Trillos Amaya, Maria. 1999. Damana, Munich: Lincom Europa. Celedon, Rafael. 1878. Palabras de la lengua guamaca que se habla en el pueblo del Rosario i en Marocasa, Collection Linguistique Américaine, Tome V, Paris: Libreros-Editores (reprint 1968 Nendeln/Liechtenstein: Kraus Reprint).
Desano	Tulio Alemán M., Reinaldo López H. & Marion Miller. 2000. Wirá ya, Peamasa ya wererituri, desano-español diccionario bilinguë de 896 palabras, Santafé de Bogotá, Colombia: Editorial Alberto Lleras Camargo. de Lima Silva, Wilson. 2012. A Descriptive Grammar of Desano, PhD Dissertation: University of Utah
Dorasque	Pinart, Alphonse L. 1890. Diccionario castellano-dorasque, dialectos Chumulu, Gualaca y Changuina, Paris: Ernest Leroux
Duit	Lehmann, Walther. 1920. Zentral-Amerika: Die Sprachen Zentral-Amerikas. (I.) Berlin: Dietrich Reimer.
Emberá/Katío	Sara, Solomon. 2001. A Tri-Lingual Dictionary of Emberá-Spanish-English, Munich: Lincom Europa. Atienza, Ángel Cayo. 2002 [1936]. El idioma katío, Edición de Ignacio Arellano y Gabriel Arellano, Madrid/Frankfurt am Main: Iberoamericana/Vervuert. Pinto García, Constancio. 1974. Los indios katíos: su cultura,

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Esmeraldeño	Seler, Eduard. 1902. Gesammelte Abhandlungen der Amerikanischen Sprach- und Alterthumskunde, Erster Band, Berlin: A. Asher & Co.
Guajiro	Jusayú, Miguel Angel & Jesús Olza Zubiri. 1981. Diccionario de la Lengua Guajira, Castellano-Guajiro,Caracas: Universidad Católica Andres Bello, Centro de Lenguas Indígenas. Captain, David M. and Linda B. Captain. 2005. Diccionario Básico: Ilustrado ; Wayuunaiki-Espanol ; Espanol-Wayuunaiki. Bogota: Edit. Fundación para el Desarrollo de los Pueblos Marginados.
Guambiano	Otero, Jesús María. 1952. Los indions Guambianos. In: Etnología caucana. Estudio sobre los orígenes, vida, costumbres y dialectos de las tribus indígenas del Departamento del Cauca. Popayán: Editorial Universidad del Cauca, pp. 243-322.
Guatuso	Constenla Umaña, Adolfo. 1982. Algunos aspectos de la etnografía del habla de los indios guatusos. Constenla Umaña, Adolfo. 1998. Gramática de la lengua guatusa, Heredia, Costa Rica: Editorial de la Universidad Nacional. von Thiel, Bernhard August. 1886. Vocabularium der Sprachen der Boruca-, Terraba-. und Guatuso-Indianer in Costa Rica, Archiv für Antropologi, XVI Band. Lehmann, Walther. 1920. Zentral-Amerika: Die Sprachen Zentral-Amerikas. (I.) Berlin: Dietrich Reimer. Conzemius, E. 1930. Une tribu inconnue du Costa-Rica: Les indiens rama du río Zapote, Anthropologie 40: 93-108.

Guaymí/Ngäbe	Quesada Pacheco, Miguel Ángel. 2008. Gramática de la lengua guaymí, Munich: Lincom Europa. Pinart, Alphonse L. 1897. Vocabulario Guaymie: Dialectos Murıre-Bukueta, Mouı y Sabanero, Paris: Ernest Leroux.
Huastec	Alejandre, Marcelo. 1889. Cartilla Huasteca con su Gramática, Diccionario, y varias Reglas para Aprender el Idioma, México: Oficina Tip. de la Secretaria de Fomento. Larsen, Ramón. 1997 [1955]. Vocabulario Huasteco del Estado de San Luis Potosí, México, D.F.: Instituto Lingüístico de Verano.
Huichol	McIntosh, Juan B. & José Grimes. 1954. Niuqui 'Ïquisicayari: Vixárica niuquiyári Teivári niuquiyari hepáïsita, Vocabulario Huichol-castellano, Castellano-huichol, México, D.F.: Instituto Lingüístico de Verano. Aceves, Raúl. 2005. Teiteri Wayeiyari: Glosario de Cultura Huichola, Guadalajara: Secretaría de Cultura de Jalisco.
Ika/Arhuaco	Celedón, Rafael. 1892. Vocabulario de la lengua de Bintukua. In: Actas del 8 Congreso Internacional de Americanistas, 600-611. Paris.
Jacaru	Belleza Castro, Neli. 1995. Vocabulario Jacaru-Castellano, Castellano-Jacaru (Aimara tupino), Cuzco: Centro de Estudios Regionales Andinos "Bartolomé de Las Casas". Farfán, J.M.B. 1955. Estudio de un vocabulario de las Lenguas Quechua, Aymara y Haqe-aru, Revista del Museo Nacional, Tomo XXIV: 81-110.
Kallawaya	Girault, Louis. 1989. Kallawaya: El Idioma Secreto de los Incas, Bolivia: Talleres Gráficos de "Mundy Color" S.R.L.
Kaqchikel	Blair, Robert W., John S. Robertson, Larry Richman, Greg Sansom, Julio Salazar, Juan Yool & Alejandro Choc. 1981. Diccionario Español-Cakchiquel-Inglés, New York and London: Garland Publishing Inc.

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K'iche'	Christenson, Allen J. Unpublished manuscript. K'iche'-English Dictionary and Guide to Pronunciation of the K'iche'-Maya Alphabet, FAMSI.
Kogi	Celedón, Rafael. 1968 [1886]. Gramática de la lengua Köggaba con Vocabularios y Catecismos, Nendeln/Liechtenstein: Kraus Reprint.
Kuna	Pinart, Alphonse Louis. 1890. Vocabulario Castellano-Cuna, Paris: Ernest Leroux. Puig, P. Manuel María. 1944. Diccionario de la Lengua Caribe-Cuna, Panama, R. de P.: La Estrella de Panama.
Kunza	Vaïsse, Emilio, Félix Hoyos and Aníbal Echeverría y Reyes. 1896. Glosario de la lengua atacameña. Santiago de Chile: Imprenta Cervantes (first published in 1895 in Anales de la Universidad de Chile 91, pp. 527–56, Santiago de Chile). Schuller, Rodolfo R. 1908. Vocabularios y nuevos materiales para el estudio de la lengua de los indios Lican-Antai (Atacameños) Calchaqui. (Biblioteca de Linguística Americana, II.) Santiago: F. Becerra M.
Kurripako	Cardona Puig, Felix. 1945. Vocabulario del dialecto karro del río guainia, Acta Venezolana 1(2): 221-230. Granadillo, Tania. 2006. An Ethnographic Account of Language Documentation Among the Kurripako of Venezuela, PhD Dissertation: University of Arizona. Mosonyi, Esteban Emilio. 2000. Breve Caracterización conjunta de las lenguas Curripaco y Piapoco. In González de Pérez, María Stella and Rodríguez de Montes, María Luisa

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Lengua de Michoacán	Warren, Benedict J. 1991. Diccionario Grande de la Lengua de Michoacán, 2 Vols., Morelia, Fimax.
Mapuche	Espósito, María. 2003. Diccionario Mapuche-Castellano, Castellano-Mapuche, Buenos Aires: Editorial Guadal S.A. Barbará, Federico. 1944. Manual de la lengua pampa, Buenos Aires: Emecé Editores, S.A.
Matlatzinca	Basalenque, Fray Diego. 1975 [1642]. Vocabulario de la Lengua Castellana vuelto a la Matlaltzinga, Revisión Paleográfica, Nota Introductora, y Apéndice por Leonardo Manrique C., México: Biblioteca Enciclopédica del Estado de Mexico. De Guevara, Fray Miguel. 1863 [1638]. Arte Doctrinal y Modo General para Aprender la Lengua Matlaltzinga, Boletín de la Sociedad Mexicana de Geografía y Estadística, México: Sociedad Mexicana de Geografía y Estadística.
Mazahua	Kiemele Muro, Mildred. 1975. Vocabulario Mazahua-Español y Español-Mazahua, Edición preparada por Mario Colín, México: Biblioteca Enciclopédica del Estado de México. Colegio de Lenguas y Literatura Indígenas. 1997. Diccionario Mazahua-Español, Toluca: Instituto Mexiquense de Cultura. Benítez Reyna, Rufino. 2002. Vocabulario práctico bilinguë mazahuua-español, México D.F.: Instituto Nacional Indigenista. Manso, Francisco. 1637. Doctrina y Enseñança en la Lengua Maçahua, México: Iuan Ruyz. Cárdenas Martínez, Celestino & Yolanda Lastra. 2011. Mazahua de San Pedro el Alto, Temascalcingo, Estado de México, México D.F.: El Colegio de México.

Miskito	Centro de Investigación y Documentación de la Costa Atlántica. 1986. Diccionario elemental Miskito-Español, Español-Miskito, Managua: División de Comunicaciones – MIDINRA.
Mixteca alta	Beaty de Farris, Kathryn (compiler), Pablo García Sánchez, Rubén García Sánchez, Jesús Ojeda Sánxhez, Augustín San Pablo García and Apolonio Santiago Jiménez (colaboradores mixtecos). 2012. Diccionario básico del Mixteco de Yosondúa, Oaxaca, Coyoacán, D.F.: Instituto Lingüístico de Verano. Dyk, Anne and Betty Stoudt. 1965. Vocabulario Mixteco de San Miguel El Grande, México, D.F.: Instituto Lingüístico de Verano.
Mixteca costiera	Stark Campbell, Sara, Andrea Johnson Peterson and Filiberto Lorenzo Cruz (Compiladores), Catalina López de García and Daniel Fidencio García Alavez (Colaboradores mixtecos). 1986. Diccionario mixteco de San Juan Colorado, México, D.F.: Instituto Lingüístico de Verano. Pensinger, Brenda J. (Compiladora). 1974. Diccionario Mixteco-Español, Español-Mixteco, México, D.F.: Insituto Lingüístico de Verano.
Mochica	Brüning, Hans Heinrich. 2004. Mochica Wörterbuch, Diccionario Mochica: Mochica - Castellano, Castellano - Mochica, Lima: Universidad de San Martín de Porres. Villareal, Federico. 2013 [1921]. La lengua yunga, Pueblo Libre: Editorial Universitaria UNFV. Salas, José Antonio. 2002. Diccionario Mochica-Castellano, Castellano-Mochica, Lima: Universidad de San Martín de Porres, Escuela Profesional de Turismo y Hotelería.
Nahuatl	Ramírez de Alejandro, Cleofas & Karen Dakin. 1979. Vocabulario náhuatl de Xalitla, Guerrero, Centro de Investigaciones Superiores del INAH.

	Brewer Forrest & Jean G. Brewer. 1971. Vocabulario Mexicano de Tetelcingo, Morelos, México D.F.: Instituto Lingüístico de Verano.
Old Guajiro (C19)	Celedon, Rafael. 1878. Catecismo I Vocabulario de la Lengua Goajira, Collection Linguistique Américaine, Tome V, Paris: Libreros-Editores (reprint 1968 Nendeln/Liechtenstein: Kraus Reprint).
Otomí	Hekking, Ewald & Severiano Andrés de Jesús. 1989. Diccionario Español-Otomí de Santiago Mexquititlán, Querétaro: Universidad Autónoma de Querétaro. Lopez Yepes, Fr. Joaquin. 1826. Catecismo y Declaración de la Doctrina Cristiana en Lengua Otomí con un Vocabulario del Mismo Idioma, Megico: Alejandro Valdés. Soriano, Fr. Juan Guadalupe. 2012. Tratado del arte y unión de los idiomas Otomí y Pame; Vocabularios de los idiomas Pame, Otomí, Mexicano y Jonaz, paleografiado y editado por Yolanda Lastra, México, D.F.: Instituto de Investigaciones Antropológicas, Universidad Nacional Autónoma de México.
Paez	Pittier de Fabrega, Henry. 1907. Ethnographic and Linguistic Notes on the Paez Indians of Tierra Adentro, Cauca, Colombia. Slocum, Marianna C. and Gerdel, Florence L. 1983. Diccionario páez-español, español-páez. Lomalinda: Editorial Townsend. del Castillo i Orosco, Eujenio. 1877. Vocabulario Páez-Castellano, Paris: Librairie-Éditeur J. Maisonneuve.
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Pame, Central	Gibson, Lorna F. N.d. Pame Pedagogical Grammar, Summer Institute of Linguistics, unpublished manuscript. Gibson, Lorna F. N.d. Pame Noun Paradigms, Summer Institute of Linguistics.
Pame, Northern	Berthiaume, Scott Charles. 2003. A Phonological Grammar of Northern Pame, PhD Dissertation, University of Texas at Arlington
Pame, Southern	Manrique C., Leonardo. 1967. Jiliapan Pame, in Norman A. McQuown (ed.), Handbook of Middle American Indians, Volume 5: Linguistics, Austin: University of Texas Press, pp. 331-348.
Puquina	Aguiló, P. Federico. 2000. El Idioma del Pueblo Puquina: Un enigma que va aclarándose, Quito: Imprefepp. Adelaar, Willem F.H. with Pieter C. Musyken. 2004. The Languages of the Andes, Cambridge: Cambridge University Press.
Purépecha	Velásquez Gallardo, Pablo. 1978. Diccionario de la Lengua Phorepecha, Español-Phorepecha, Phorepecha-Español, México D.F.: Fondo de Cultura Económica. Pérez Pamatz, Felipe and Benjamin Lucas. 2004. Glossary of Coppersmithing. In: Michele Feder-Nadoff (ed.), Ritmo del Fuego, México: Morevallado Editores. Horcasitas de Barros, María Luisa. 1981. Una artesanía con Raíces Prehispánicas en Santa Clara del Cobre, Addenda 1980, México D.F.: Instituto Nacional de Antropología e Historia. Horcasitas de Barros, María Luisa. 1974. Cobre Martillado:

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Quechua, Ancash	Parker, Gary J. & Amancio Chávez. 1976. Diccionario Quechua: Ancash-Huailas, Lima: Ministerio de Educación/Instituto de Estudios Peruanos. Julca Guerrero, Félix. 2009. Quechua Ancashino: Una Mirada Actual, Lima: CARE Perú.
Quechua (all modern)	Ladrón de Guevara, Laura. 1998. Diccionario Quechua de las Regiones: Ayacucho - Cuzco - Junin - Ancash - Cajamarca, Lima: Editorial Brasa S.A.
Quechua, Cajamarca	Quesada Castillo, Felix. 1976. Diccionario Quechua: Cajamarca-Cañaris, Lima: Ministerio de Educación/Instituto de Estudios Peruanos
Quechua, Cusco	Hornberger, Esteban S. & Nancy H. Hornberger. 1978. Diccionario tri-lingue: Quechua of Cusco/English/Spanish, Volume III Español Quechua, Qosqo: Imprenta Prelatura de Sicuani.
Rama	Rigby, Nora & Robin Schneider. 1989. Dictionary of the Rama Language, Berlin: Dietrich Reimer Verlag. Conzemius, E. 1930. Une tribu inconnue du Costa-Rica: Les indiens rama du río Zapote, Anthropologie 40: 93-108.
Sechura	Loukotka, Cestmír. 1949. Sur quelques langues inconnues de l'Amérique du Sud. Lingua Posnaniensis I. 53-82
Sirionó	Schermair, E. Anselmo. 1962. Vocabulario Castellano-Sirionó, Vienna: Mechitaristen-Druckerei.
Sirionó	Cadogan, Léon. 1992. Diccionario Mbya-Guaraní - Castellano, Asunción: Editora Litocolor S.R.L. Holmberg, Allan R. 1950. Nomads of the Long Bow: The Siriono of Eastern Bolivia, Washington:L United States Government Printing Office.

Taíno	Granberry, Julian & Gary S. Vescelius. 2004. Languages of the Pre-Columbian Antilles, Tuscaloosa: University of Alabama Press. Gaztambide Arrillaga, Carlos. 1992. Diccionario Gaztambide Taíno-Español/Español Taíno (Tomo XXIII), Puerto Rico: Ramallo Bros. Printing Inc. Highfield, Arnold R. 1997. Some Observations on the Taíno Language. In: Samuel M. Wilson (ed.), The Indigenous People of the Caribbean, Gainesville: University of Florida Press.
Teribe	Diego Quesada, J. 2000. A Grammar of Teribe, Munich: Lincom Europa. Heinze, Carol. 1979. Cursillo de Asimilación - Teribe, Panamá: Editorial de la Nación. von Thiel, Bernhard August. 1886. Vocabularium der Sprachen der Boruca-, Terraba-. und Guatuso-Indianer in Costa Rica, Archiv für Antropologi, XVI Band. Arroyo, Víctor Manuel. 1972. Lenguas indígenas costarricenses, San José: Editorial Universitaria Centroamericana (EDUCA). Gabb, William M. 1875. On the Indian Tribes and Languages of Costa Rica, Proceedings of the American Philosophical Society, 14(95): 483-602.
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Appendix E: Metallurgy wordlist

alloy
anvil
arrow [point]
arsenic
awl
axe
axe money/naipe
axehead
balance/scale(s)
bead
bell (different types)
bellows
blade, curved (for cleaning plancha)
blowtube
bowl
bracelet
brazier/clay furnace
breastplate
bronze
brooch
burin
button
cast/mould
chisel
cinnabar
clamps, c-clamps
compass
copper
crown
crucible
deposit (of ore/mineral)
digging stick tip
disc/coin
disc, flat used in electric grinders
disc, flat and thick of hammered copper
ear spool, earring
enamel
fan (electric)
file (iron or steel for smoothing)
finger ring
fire
firewood
fishhook
form/stake used to give a piece form
fuel
furnace
gilding
gold
hammer
head ornament
helmet
hoe
hot
ingot
iron
knife
lip plug, labret

lost wax casting
metalworker
mine
moneychanger, barterer
moveable metal stake
necklace
needle
nose ring
open ring
ore
outline/trace
pin
pit
pliers
pole, wooden for removing impurities
rattle
rocks around mouth of cendrada
scraping pole
scribed guidelines
shears
shield
silver
silversmith
slag
sledgehammer
smelter
smithy
smoke
soldering
spear head/point
stick for cleaning molten copper
stones for containing old metal
sword
temperature
tin
to add height to walls of vessel whilst deepening
to alloy
to cast
to crush [slag]
to even up
to fold object's edge
to gild
to give the object (cazo) the desired height
to hammer
to locate ore
to melt
to mine
to polish/shine/burnish
to shape
to silver-plate
to smelt
to solder, weld
to stretch, extend
to work metal
tongs
tool blade
tumbaga
tweezers
vessel, wide-mouthed
wax

white hot
woodblock, dapping bench
wooden piece for tracing circles
workshop

Appendix F: Languages recorded in Michoacán, 1521-1804 CE (following Gerhard, 1993 [1972])

Provincia	Modern state	Main language(s) at contact	Other language(s)
Amula	Jalisco	Otomí dialects (Amultecan, Bapame, Pino, Zapoteco)	N/A
Charo (Matlatcinco)	Michoacán	Pirinda/Matlatzinca, Tarascan	N/A
Cinagua y la Guacana	Michoacán	Tarascan	Nahua (traces, possibly)
Colima	Colima, Jalisco	Archaic Nahua (possibly), "Otomí", Xilotlantzinca (form of Nahua?)	Tarascan?
Cuiseo de la Laguna	Michoacán	Tarascan, Chichimec (likely Pame or Chichimeca-Jonaz)	N/A
Guaymeo y Sirándaro	Michoacán	Tarascan	Matlatzinca, Apaneca (aka Pantecan?), Náhuatl, Cuicatecan, Chontal
Maravatio	Michoacán	Tarascan, Otomí, Náhuatl	Mazahua (replaced Tarascan by mid-17th century)

Motines	Michoacán	Tarascan	Cuauhcomeca (inland), Epateca, Aquilan, Motintlan, Maquilian, Huahuan (all coastal, affiliations unclear)
Sayula (Avalos)	Jalisco	Sayultecan (probably Nahua variety), "Pinome" (aka Cora), Coca/Tachtoque (related to Pinome/Cora), another Nahua language	N/A
Tancítaro	Michoacán	Tarascan	Xilotlatzinca (Nahua)
Tetela del Río	Guerrero	Cuitlatec, Nahuatl	Chontal, Coixca (Nahua), Tarascan, Tepuztec
Tinhuindín	Michoacán	Tarascan	N/A
Tlapuxagua	Michoacán	Mazahuan	Pame, Nahuatl
Tlazazalca	Michoacán	Tarascan	Mexicano (i.e. Nahuatl)
Tuspa	Jalisco	Cochin, Chichimeca, Nahua, Piñol/Pino (probably Cora, Tiam, Xilotlantzinco (Nahua), Zapotlanejo (prob.	Tarascan (by 1570)

		Nahua variety of Zapotlán)	
Valladolid (now Morelia)	Michoacán	Tarascan	Nahua, Matlatzinca, Guamare
Xiquilpa (Guanimba)	Michoacán	Nahua (Sayultecan?)	Tarascan
Zacatula	Michoacán	Chumbian, Tolimecan, Pantecan, Cuitlatecan (all at contact); also Náhuatl ('mexicano tosco'; coastal lingua franca), Mexicano, Cuitlatec & Tepuztecan (aka Chinantec? Or another Nahua variety)	Tarascan (at trading outposts?)
Zamora y Xacona (modern Jacona)	Michoacán	Sayultecan, Tamazultecan (both Náhua), Tarascan, 'corrupt' Mexican (i.e. Nahuatl)	Chichimec (possibly)

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Postscript

her steel tringle rings
and bees swarm to her hollow oak
what magic brings *us* home?

[…]

to be drunk once more
at a Mexican fiesta!
Time doesn't matter

(Paul Friedrich, a goldfinch instant)

Curriculum Vitae

Kate Bellamy was born in Sheffield (UK) in 1981. She attended King Edward VII Secondary School, leaving in 1999 with Advanced Levels in English Language, French, German, General Studies and a GCSE in Italian. After a year working and studying in France and Italy, she went up to Cambridge University in 2000 to read Modern and Medieval Languages, graduating with a Bachelor (Honours) in 2004. From 2004 to 2010 she worked in the UK and Luxembourg, mostly on European cooperation projects in higher and vocational education. In 2010 she returned to studying, in the form of the Research Master in Linguistics (Structures and Variation in Languages of the World) at Leiden University, from which she graduated (*cum laude*) in 2012. During the Master's programme she also worked part-time as a Student Assistant in the 'Evolutionary Processes in Language and Culture' research group at the Max Planck Institute for Psycholinguistics in Nijmegen. Following a year working full-time as a Research Assistant in the same research group, in June 2013 she joined the ERC-funded project 'The Linguistic Past of Mesoamerica and the Andes: A search for early migratory relations between North and South America', led by Prof. dr. Willem Adelaar. This thesis is the main product of that research.

Nederlandse samenvatting

Over de externe relaties van het Purepecha
Een onderzoek naar classificatie, contact en woordvormingspatronen

Dit proefschrift, waarin gebruik wordt gemaakt van een systematische aanpak met meerdere methodes, bekijkt het Purepecha in de context van Latijns-Amerika vanuit genealogisch en contactueel perspectief, en biedt inzicht in de geschiedenis van de taal door middel van twee onderzoeken die zich concentreren op woordvormingsprocedés. Het genealogische onderzoek neemt de twee meest prominente classificatievoorstellen voor het Purepecha - Greenberg (1987) en Swadesh (1967) - opnieuw onder de loep en komt er op basis van een kwantitatieve woordenschatvergelijking aan de hand van de Oswalt Monte Carlo Shift Test en een meer traditionele typologische vergelijking van affixvolgorde op uit dat er geen teken van verwantschap tussen het Purepecha en enige andere hier onderzochte taal vastgesteld kan worden. De twee onderzoeken naar taalcontact behandelen mogelijke interactie tussen het Purepecha en andere talen op langeafstands-, regionaal en lokaal niveau. De woordenschat die betrekking heeft op metallurgie, het meest overtuigende archeologische bewijs voor interactie tussen Zuid-Amerika en West-Mexico, ondersteunt dit contactscenario niet, hoewel het gebrek aan waarneembare leenwoorden in dit domein mogelijk een gevolg is van de grotendeels non-verbale aard van technologische overdracht. Een woordenschatvergelijking van meer dan 1600 termen laat zien dat het Purepecha ook op regionaal en lokaal niveau heel weinig leenwoorden uit de precolumbiaanse tijd vertoont. Deze schaarste aan leenwoorden staat in contrast met de situatie in de moderne tijd, waarin het Spaans een enorme invloed uitoefent op alle aspecten van de taal. De omschakeling in het leenpatroon is te verklaren door de kolossale sociaal-politieke verschuiving die de sprekers van het Purepecha sinds de oplegging van het Spaans meegemaakt hebben, waarbij taal als een spiegel voor sociale verandering werkt. De twee onderzoeken naar woordvorming concentreren zich op de variërende semantische doorzichtigheid van de wortels en suffixen die in de taal voorkomen, met specifieke nadruk op reuktaal, en leiden tot het

idee dat de wortels misschien precategoriaal van aard zijn. Dit taalinterne werk verschaft meer context voor toekomstig onderzoek naar historische ontwikkelingsprocessen en mogelijke taalvergelijkende ondernemingen.