Synchronic and Diachronic Morphoprosody:

Evidence from Mapudungun and Early English

Benjamin J. Molineaux

St. Hilda's College

University of Oxford

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Contents

List of Abbreviations

Languages

Ch.Sp.	Chilean Spanish
EME	early Middle English (1066-1340)
EModE	early Modern English (1476-1650)
EOE	early Old English (attested 700-900)
IE	(proto) Indo-European
LME	late Middle English (1340-1476)
LOE	late Old English (900-1066)
ME	Middle English (1066-1475)
NF	Norman French
OE	Old English (approx. 700-1066)
OF	Old French
ON	Old Norse
PDE	Present Day English
PDM	Present-Day Mapudungun
Span.	Spanish

Reference Works

AUG	Diccionario Araucano-Español y Español Araucano, Fr. Félix de Augusta
BT	Bosworth & Toller Anglo-Saxon Dictionary
MED	Middle English Dictionary
OED	Oxford English Dictionary

Parallel Glossing

1	First person
2	Second person
3	Third person
ACC	Accusative
AGENT	Agentive
AMB	Ambulative
AND	Andative
APPL	Applicative
ASP	Aspectual
BI	Broken implicature
CAUSE	Causative
CIS	Cislocative
CONT	Continuative
D	Dual
DESID	Desiderative
DIR	Direct
F	Focus
FP	Focal person
FP	Focal person
FUT	Future
GEN	Genitive
HABIT	Habitual
IMP	Imperative
IND	Indicative
INF	Infinitive
INS	Instrumental
INV	Inverse
IPERF	Imperfect
NEG	Negative
NMLZ	Nominaliser
NOM	Nominative
P	Plural
PASS	Passive
PERF	Perfect
POSS	Possessive pronoun
POST	Postposition
PRET	Preterit
PROG	Progressive
PSIST	Persistence
PTCP	Participle
PURP	Purpose
PX	Proximity
REFLEX	Reflexive
REL	Relation
REP	Reportative
REST	Repetitive/Restorative
S	Singular
SIM	Simulative
SITU	Situator
SP	Satellite pers.
SUBJ	Subjunctive
SVN	Subjective verbal noun
TEMP	Temporal
TR	Transitive/Transitiviser
TRLOC	Translocative
VB	Verb/Verbaliser

For a detailed list of Mapudungun suffixes and Old English prefixes and their functions, see appendices B and D, respectively.

Abstract

In the individual grammars of time-bound speakers, as well as in the historical transmission of a language, prosodic and morphological domains are forced to interact. This research focuses, in particular, on stress, and its instantiation in different domains of the morphological structure. It asks what factors are involved in prioritising one system – morphology or stress assignment – over the other and how radical the consequences of this may be on the overall structure of the language.

The data comes from two typologically distinct languages: Mapudungun (previously *Araucanian*), a polysynthetic and agglutinating language isolate from Chile and Argentina documented for over 400 years; and English, far further into the isolating and fusional spectra, and documented from the 7th century onwards. In both languages, we focus on morphologically complex words and how they evolve in relation to stress. In Mapudungun we examine the entire historical period, while in English we focus on the changes from Old to Middle English (8^{th}-14^{th} centuries).

The analyses show how different types of data (from acoustics, to native and non-native intuitions; from historical corpora, to present-day experimentation techniques), can be used in order to assess whether the prosodic system will accommodate to the demarcation of morphological domains or whether morphological structure is to be shoehorned into the prosodic system's rhythmic pattern.

Original contemporary field and experimental work on Mapudungun shows stress to fall on right-aligned moraic trochees in the stem and word domains. This contradicts claims in the foot-typology literature, where Araucanian stress goes from left to right, building quantity-insensitive iambs. A reconstruction of the history of the stress system suggests a transition from quantity insensitivity to sensitivity and the establishment of two domains of stress, which ultimately facilitates the parsing of word-internal structure, emphasising the demarcative function of stress.

In the case of Early English, the focus is on the prefixal domain. Here the optimisation of the stress system – also trochaic – is shown to reduce the instances of clash in the language at large. As a result, a split in the prefixal system is identified, where prefixes constituting heavy, non-branching feet are avoided – and are ultimately lost – due to clash with root-initial stress, while light and branching feet remain in the language. In this case, it is the rhythmic or structural role of stress that is emphasised.

Language internal factors are evaluated – in particular morphological type and stress properties – alongside external factors such as contact (with Chilean Spanish and Norman French), in order to provide a more general context for the observed changes and synchronic structure of the languages. A key concept in the analysis is that of *pertinacity*, the conservative nature of transmission in grammars, which leads learners to perpetuate perceived core elements of the system.

Chapter 0

Introduction

To communicate, human languages must resolve the issue of grouping units of meaning by using elements that are predominantly formal, and which themselves are grouped into larger formal units. Although in a number of cases the units of meaning (the morphology) are coextensive with regular groupings of units of the formal type (the prosody), languages display wide variance in the way these two types of structure interact. A rich tradition of research in the domain of Prosodic Morphology (McCarthy & Prince 1986, 1990; Downing 2006) has shown that prosodic structures (more specifically, prosodic templates) may in some languages be the key morphological elements themselves. However, in most cases, parsing of prosodic and morphological structure is not isomorphic, requiring the two systems to find common ground, one level of structure acquiescing to the other's requirements.

In the chapters that follow, the focus will be on two languages – Mapudungun and Early English – presented as case studies towards understanding the complex relationship between prosodic structure and morphology. It will be argued that, while the first language represents a morphology-strong system, the second is prosody-strong. The emphasis is on the interaction of stress and affixation at the stressed edge of the

prosodic word. In particular this means examining suffixation in Mapudungun, for which it will be claimed that stress falls on the penultimate mora of the word, in counterpoint with prefixation in Early English, where stress is predominantly word-initial. The dominance relations of prosody and morphology are shown to be crucial both to the synchronic organisation of grammar and to the changes undergone by the morphology and prosodic structure diachronically.

A further claim is that the relative strength of the role of prosodic structure – stress in particular – in the two languages is not random, but follows from typological characteristics of the morphology. Where Mapudungun is polysynthetic and agglutinating, with a number of sub-syllabic or syllabically underspecified suffixes, Early English is only predominantly fusional, with minimally syllabic morphemes. Furthermore, where Mapudungun is exclusively suffixing, Early English is predominantly so, with prefixes (which are focused on here) making up the smaller category of affixes.

For Mapudungun the complexity of the morphology, alongside its lack of pre-defined syllabic structure, means that prosodic parsing and stress assignment are subordinated to the transparency of the morphology. In the case of Early English, the abundant prosodic structure embedded in the morphemes themselves (both prefixes and suffixes), and the fact that individual elements of meaning are not usually extractable as independent phonological units, means that they are susceptible to further modification based on the prominence of their position within the prosodic structure (cf. for instance van Coetsem 1996).

One of the overall arguments we present is that, based on the requirements of the morphology, stress and prosodic structure display different properties. The agglutinating language shows a use of stress and prosodic organisation that may be characterised as *functional*, relying mostly on communicational features such as demarcation of words and morphemes. On the other hand, stress and prosodic organisation in the fusional

language show properties that may be described as *structural*, relying on culminativity, alongside rhythmic organisation and clear positional prominence and non-prominence effects.

A key consequence of the differences in these two systems is that when push comes to shove in the diachronic interaction of prosody and morphology, Mapudungun displays changes to the stress-system (development of weight sensitivity, and changes to domain-edge marking), while English turns to modifying the morphological structure (prefix-loss and lexicalisation, and suffix reduction, merger and loss). The emphasis, therefore, is not only on what changes in the structure of the language tell us about said structure, but also on what elements specific grammars hold fast to, and why these appear to be more basic. This question bears upon what has been termed *pertinacity* in grammars (Dresher & Lahiri 2003), that is, their tendency to preserve particular structures in the context of more or less radical processes of change.

0.1 The role of stress in language

> ...[I]t would be folly to attempt to analyse English without stress. At best, obvious generalisations would be missed. Let us therefore assume that there is no disagreement of interpretation, that all researchers agree that English has word stress. The issue of interpretation becomes more relevant when approaching systems which, unlike English, show only a mild interest in stress.' (Hyman forthcoming: §2)

As has already been suggested, Mapudungun and Early English display markedly distinct prosodic properties. This is particularly so for stress. Whereas at every diachronic stage English shows the influence of stress to have percolated into its phonological system (cf. §6.1.3, §7.5 §8.1.2.2), Mapudungun shows practically no phonologisation of stress (cf. §8.1.2.2), even when it does show direct interaction of stress and morphological structure through demarcation (cf. §4.2.4.1, §4.3.2, §5.5.2). Although

the properties of Early English stress are more 'prototypical' (cf. Hyman 2009: 217-8) than those of Mapudungun, we will argue that both can be characterised as stress-languages and that the position of stresses is the most evident marker of certain levels of their prosodic organisation.

The physical manifestation of stress shows important variability from language to language (Gordon cf. 2011a for a summary), as well as overlap with the cues to other prominence types, such as tone or so called 'pitch accent' (Gussenhoven cf. 2004, 2007 but cf. Hyman 2009 for a critique of the latter category). The key suprasegmental acoustic parameters that are typically related to the presence of stress are greater pitch, duration and intensity as compared to syllables said to lack stress (cf. Fry 1955, 1958; Gordon 2004). In particular in the case of languages that signal stress through pitch differences alone, the line between stress, intonation and tone may be less clear-cut than in other languages (Hyman 2006).

Furthermore, a number of segmental and phonotactic phenomena may also affect stressed and unstressed syllables differently, providing cues to stress location (cf. Gordon 2011a). These latter phenomena, though part of more 'prototypical' stress systems such as English, need not surface in all stress languages. All in all, however, the phonetic form of stress is clearly independent from the perceptual or psychological reality of the phenomenon (cf. Lehiste 1970: 150, Hayes 1995: 9, de Lacy forthcoming: §3.7). Hence, a merely phonetic approach does not seem to capture the more essential properties of stress that interact with the rest of the linguistic system.

The two key perspectives on the role of stress in language are what were referred to above as the *functional* and *structural* approaches. Although both views describe the same phenomena overall, they do so with different explicative goals in mind.[1] While the

[1] According to Hyman (forthcoming: §2) the goal of functional approaches to stress is to answer the question 'What is the relative perceptibility of the different acoustic correlates of stress-marking across languages?', while the formal (read 'structural') approach attempts to tackle the question 'What is the range of structural rules assigning stress across languages?'

functional approach focuses on the value of stress and prosodic structure for parsing and communicating meaning, the structural approach focuses solely on the formal aspects of parsing the speech signal, with particular focus on rhythmic structure. Insofar as one of the two outlooks permits a better description of a specific language, we may claim that that language's properties give stress a more 'functional' or 'structural' role.

0.1.0.1 Functional approaches to stress

Although the bulk of the generative tradition on stress and prosody are predicated on structural properties (often in the form of parameters), the fact that not all languages place the same value on rhythm does tend to be acknowledged. In Hayes's (1995) account, where stress does not follow a predominantly rhythmic pattern, it can be said to display morphological properties: 'In a morphological system, stress serves to elucidate the morphological structure of the word' (32). The key property of stress in this type of analysis, we argue, is that of *demarcation*.

A morphological or functional view of stress, therefore, places emphasis on parsing morphological structure and, therefore, on the communicative value of stress overall. Such an approach, which is typical of the Prague School (Garde 1967; Martinet 1964), focuses on the parsing of words, with the issue of culminativity of stress being subordinate to demarcation. In short, the idea that every lexical word must have 'one and only one main stress' (i.e. *culminativity* cf. Jakobson 1931, Trubetzkoy 1939) naturally gives way to a criterion for wordhood (i.e. the word is the domain of maximal stress). Furthermore, since primary stress tends to be assigned in a fixed relation to a word-edge, then it can be said to communicate the beginnings or ends of words.

Some languages, however, take this focus on demarcation further, marking the edge not only of the word, but also of sub-lexical morphological domains. Although accounts often separate these two properties of stress-systems (i.e. 'morphological' stress marks

word-internal structure, while 'demarcation' *per se* marks word boundaries, cf. Garde 1967, Hyman 1977: 39), it is our claim that they are both essentially demarcational features that are displayed at different levels. The examples in Table 1 shows stress in Russian marking the stem-final syllable, as opposed to Polish, marking the penultimate syllable.

Table 1: Stem-final stress in Russian vs. Penultimate stress in Polish (data from Garde 1967 cited in Hyman 1977: 39)

Russian		Polish	
raspráva	'reprisal, NOM.S'	*rozpráwa*	'discussion, NOM.S'
raspráv	'reprisal, GEN.P'	*rózpraw*	'discussion, GEN.P'
rasprávami	'reprisal, INST.P'	*rozprawámi*	'discussion, INST.P'

Of course, where a purely word-level demarcative system presents no overt contradictions with rhythmic stress, a system that highlights more than one element of the morphological structure via stress-cues may well encounter some insurmountable difficulties in order to be analysed under a structural approach. This is particularly the case when stress is used to mark more than one level of the morphology, as we will claim to be the case for Mapudungun.

0.1.0.2 Structural approaches to stress

Standard generative approaches to stress are all predicated on a formal or structural approach to stress. Where the fundamental property of the functionalist perspective was claimed to be demarcation, here the key property is rhythm (Lieberman & Prince 1977; Halle & Vergnaud 1987a; Hayes 1995). Under the form of metrical feet or grids, this paradigm has focused on the organisation and distribution of stressed and non-stressed positions among the world's languages (cf. Gordon 2011b; Hermans 2011; Kager 2012: for recent surveys of these issues). To do so, it abstracts away from the phonetic and communicative aspects of stress, in order to concentrate solely on its

phonological characteristics: 'In a rhythmic stress system, stress is based on purely phonological factors, such as syllable weights or limitations on the distance between stresses and between stress and word boundaries.' (Hayes 1995: 31).

In such a system, the issue of culminativity is axiomatic, anchoring rhythmic organisation onto the edge of a prosodic unit. Furthermore, a number of other segmental and phonotactic processes are predicted to fall out from the position of stress. These positional prominence and non-prominence effects are predominantly related to enhancement and reduction of segmental contrasts under the influence of stress and lack of stress, respectively (van Coetsem cf. 1996; Gordon cf. 2011a and §8.1.2.2).

0.1.1 Morphology, stress and change

The diachronic interaction of stress and morphological structure usually invokes the issue of *deflection* (cf. Weerman 1989). This type of phenomenon, typical of most Germanic languages (particularly English), refers to the collapse of inflectional categories, which is, in turn, linked to processes of reduction and loss in unstressed syllables (Lass cf. 1992: 105, §6.1.3). This erosion of inflection is usually taken to represent a pattern of change from one morphological type to another (typically from synthetic to analytic) for which Sapir (1921: 129) coined the term *drift*.

Although these types of morphological change are crucial to an ultimate understanding of the diachronic relationship between morphological and prosodic structure, this thesis focuses not on phenomena derived from weakness of structure due to stresslessness, but on the changes spurred by conflict among strong, stressed elements. The key insight to this effect is that stress-clash (i.e. the immediate adjacency of two stressed syllables) is dispreferred crosslinguistically. This is the case both for languages that emphasise the structural role of stress and those that privilege its functional properties. While in the former case, stress-clash interferes with the rhythmic organisation

of prosodic units, in the latter languages stress adjacency (or even surface conflation, §5.5.2) entails less distinct prominence contours and, therefore, a loss of precise information concerning morphological boundaries.

In the case studies, immediate succession of two stressed syllables within a word is always the result of morphological concatenation. For the earliest stages of Mapudungun (17^{th}-18^{th} centuries) we find that this arises between stem-final stress and word-final trochaic stress (1.a). By later stages of the language (19^{th}-20^{th} century) this clash is resolved through reassigning the domain of stem-stress in order to include little more than the verbal root (1.b). This type of change, it is claimed, allows the morphological structure to be highlighted more clearly.[2]

(1) Mapudungun: Diachronic reassignment of clashing stem-(S) and word-stress (ω)

	17^{th}-18^{th} centuries		19^{th}-20^{th} centuries
a.	$[[$kɨθaw-kijáw$]_S$-ì-m-i$]_\omega$ 'work-AMB-IND-2-S'	>	b. $[[$kɨθáw$]_S$-kijaw-í-m-i$]_\omega$ 'work-AMB-IND-2-S'

Although Early English is also predominantly suffixing, the focus here is on prefixes, which attach to stress-initial root-morphemes. As a result, such prefixes may clash with root-stress if they are monosyllabic and stressed. While in Old English this clash was tolerated, independent language internal factors seem to have led to a preference in Middle English for branching feet, and a dispreference for clash overall. As a result, it will be claimed that heavy monosyllabic prefixes were either lost (2.a) or lexicalised (2.b) in order to fit in with the language's prosodic structure. Key to the analysis is the idea that prefixes were parsed as full stress-bearing prosodic words only if they met the minimal word requirement of bimoraicity.

[2]Details of the analysis will follow (cf. §4.5.2, §5.5.2), however, we mention here that the distinction between Mapudungun primary and secondary stress is usually only obvious in clash conditions and hence is only marked in such contexts (cf. Example 1).

(2) Early English: Loss (a.) and lexicalisation (b.) of clashing prefixes

	Old English		Middle English
a.	[òn]$_\omega$-[scúnian]$_\omega$ 'away-shun'	>	[shónen]$_\omega$ 'shun'
b.	[wìð]$_\omega$-[stándan]$_\omega$ 'against-stand'	>	[withstánden]$_\omega$ 'withstand'

It will be claimed here that properties of morphological and stress systems are not randomly distributed in languages and that, furthermore, their relationship over time leads to non-trivial changes overall. The effects of such changes tend to be seen, by and large, in the system which is deemed subordinate.

0.2 The languages, data and methods

It will be clear by now that the choice of Mapudungun and Early English as case studies stems from the possibility of examining similar phenomena in radically different linguistic systems. While the key issue to be explored is the interaction of stem and affix stress, morphological and stress type are considered to affect the synchronic and diachronic outcome of their interaction.

There is no doubt that an analysis of these types of phenomena would benefit from a broader sampling of languages than the two we focus on here. A closer look at the complexity of the data in the upcoming chapters, however, will show that simple blanket generalisations on the relation of stress and change at morphological boundaries are risky without an overall understanding of the languages. In this sense, the careful examination of case studies is suggested to be more illuminating than attempts at drawing inferences from only partial views of a language.[3]

[3]This type of issue will be particularly evident when examining the typological claims made about Mapudungun in the literature, on the basis of the data in Echeverría & Contreras (1965). See de Lacy (forthcoming) for more on this issue in particular.

Of course, though we find clear differences in the morphological type and prosodic structure of Early English and Mapudungun, there are also a number of aspects in which the languages converge. As we shall see, both languages are predominantly suffixing and, it shall be argued, have uneven trochees as their basic foot structure. Furthermore, although we shall argue mostly for language-internal changes, the periods we shall examine are marked by a substantial amount of lexical borrowing and persistent contact with incoming languages.

0.2.1 Mapudungun

Substantial portions of this thesis (chapters 2, 3, 4) attempt a synchronic description of Present Day Mapudungun (hereafter 'PDM', isolate: Chile, Argentina). The language's richness and variety of polysynthetic, agglutinating morphological structure (cf. §1.2.2), coupled with weight-sensitive stem and word-level stress assignment patterns, make the field of Mapudungun morphoprosody an interesting challenge. At the very least, the abundance of discrete morphology means more material over which to compute word-prosodic structure. It also means, potentially, more levels of embedding of the material. In the ideal polysynthesis condition in which 'each sentence consists of one word', sentence prosody is redundant. This, furthermore, brings up questions regarding the relation between word-internal prosodic domains in polysynthetic languages and sentence prosody in languages of the isolating spectrum, as well as a reassessment of the classic properties of word-stress (culminativity, demarcation, rhythm) in polysynthetic languages.

Mapudungun stress has recently been put in the spotlight by de Lacy (forthcoming), for issues relating to the uses and abuses of stress-data in linguistic typology. In particular de Lacy levels a number of criticisms at the widespread use of the data in Echeverría and Contreras's (1965) study of Mapudungun (Araucanian) phonology.

Much of the prosodic-typology literature (cf. Hyman 1977: 41-2, Kager 1993: 409, 2007: 205-6, Hung 1993: 177-80, 1994, Kenstowicz 1994a: 556, Hayes 1995: 266, Gordon 2002: 522, 2011b: 143 Hyde 2002, McGarrity 2003: 59-61, Tesar 2004: 220-21, Hermans 2011: 982-984 to name only a few) use the handful of forms given in the 1965 article in order to substantiate claims regarding the existence (or lack thereof) of prosodic structures following a left-to-right quantity insensitive iambic pattern. Crucially, in all possible parameters the 'typological' description is opposed to what we find in the predominant claims of Mapudungun-specific studies (cf Valdivia 1606; Febrés 1765; Havestadt 1777; Augusta 1903; Moesbach 1962; Erize 1960; Salas 2006; Zúñiga 2006b).

Table 2: Mapudungun stress-assignment parameters in typological literature (based on Echeverría & Contreras 1965), vs. the Mapudungun-specific literature (cf. in particular Zúñiga 2006a, 2007b).

Account	Foot	Weight	Direction	Iteration
Typological	Iambic	Insensitive	Left-Right	Yes
Lang-specific	Trochaic	Sensitive	Right-Left	No

It seems clear that a new assessment of the issue of Mapudungun stress is sorely needed. Although the original data and analysis presented here will ultimately come down closer to the side of the language-specific studies, some very important shortcomings in these accounts are also noted. A number of arguments will also be ventured in order to explain the fact that there is such divergence in the interpretation of the stress-patterns. In line with the main argument of the thesis, we point out that the key issue that earlier accounts do not tackle is that of morphological structure and its influence on the position of stress.

The data for contemporary Mapudungun upon which the new analysis is based comes from original fieldwork undertaken in Chile (cf. §3.1, Appendix A). Some methodological issues, however, arise with regards to the reliability of judgements for

stress position. Even though native speakers were consulted as to their intuitions for the position of stress in words in isolation, all informants were bilingual in Spanish. The possibility that overlap in the speakers' phonological modules for stress assignment in Spanish and Mapudungun could affect their perception of stress position in the latter language (de Lacy forthcoming: §3.2) led to a search for further means to disentangle these intuitions. Key to this effect was the use of acoustic measures (§3.2.1.2, §3.2.2.2) and the design of a perception task for non-native speakers of Mapudungun (§3.2.1.3). The results of both additional methods showed clear consistency of native speaker intuition and a distinct pattern from that of Spanish, thus giving greater strength to the assessment of stress-position overall.

As we shall see (cf. Chapter 1, §5.5.5), attestations of Mapudungun date back over four centuries. This period has been marked by growing contact with Spanish, intensive borrowing, a shrinking number of native speakers, and – since the mid-twentieth century – practically universal bilingualism. A reasonable amount of historical data is therefore available. Such data spans a stage of the language under conditions that may be conducive to important language change. Nevertheless, work on the history of Mapudungun is still limited,[4] a situation which this thesis intends to contribute towards ameliorating.

In a way the historical Mapudungun section (Chapter 5) is an experiment: to try to draw as many consequences as possible from sparse data. Unless there is very strong evidence otherwise we take the historical accounts – predominantly missionary grammars – to be accurate. Although the amount of data Indo-European linguistics

[4]Lenz (1895-1897) unsystematically observes some segmental variation between the older and newer missionary grammars. Salas (2003) provides a few guidelines for a historical study of the language, which basically involve a contrastive analysis of the early grammars. More significantly, Zúñiga (to appear) uses language-internal data, alongside earlier grammars, to explore the diachrony of Mapudungun applicatives, while Hasler & Soto (2012) provide an analysis of the history of some aspects of the consonantal inventory of sixteenth- and seventeenth-century Mapudungun, based on the incorporation of Spanish loanwords.

has had at its disposal is undoubtedly far greater than will ever be available for Native American languages overall, Indo-Europeanists have reached the current state of the art through a fair amount of speculative work and 'best possible use of bad data'. This is precisely what is attempted here: to take some first tentative, exploratory steps into the historical linguistics of an endangered, under-documented language.

0.2.2 Early English

Early English (Germanic: Anglo-Saxon/Medieval England) encompasses both the Old and Middle English stages of the language. The focus here is on the period spanning the late eighth to the late fourteenth centuries, which saw a number of substantial changes throughout the language, including the syntax, morphology, phonology and lexicon. As regards the morphoprosody, the most prominent changes were those related to unstressed inflectional suffixes (§6.1.2).

Another important change, however, was the loss of a large number of native prefixes. Accounts of their loss in Early Middle English (EME) have been proposed on the basis of semantics (Samuels 1972; Brinton 1989; Kastovsky 1992), syntax (Hiltunen 1983; van Kemenade & Los 2003; Elenbaas 2007), phonology (Lutz 1997), and Grammaticalisation Theory (Hopper & Traugott 2003; van Kemenade & Los 2003). All such accounts, however, have been restricted to the loss of verbal prefixes, failing to explain the simultaneous decay of identical structures within nouns and adjectives.

Since explaining prefix loss on the basis of word category membership has led to a piecemeal account of the overall process, this study disregards the distinction altogether, focusing exclusively on prosodic factors. Contrary to what is found with suffixes, however, it is not the light prefixes (*be-, ge-*), but the heavy ones (*æt- tō-, þurh-*, etc.) which were lost between Old and Middle English, which may be precisely why this aspect has been overlooked thus far.

The preservation of stressed, disyllabic prefixes (*ofer-, under-, fore-*), along with uniformly unstressed, light prefixes (*be-, ge-*), should give a clue to the reasons behind prefix loss proposed here. In both prefix types, the syllable immediately preceding the root is unstressed, regardless of word category, as exemplified in 5.5.6.

(3) Preserved prefixes: no clash in disyllables (a-b) or light monosyllables (c-d)

	*	*				*	
a.	[un.der]	[stan.dan]	'understand'	c.	[be]	[se.ōn]	'look around'
	*	*				*	
b.	[fo.re]	[heā.fo.de]	'forehead'	d.	[ge]	[cynn]	'nature'

In the case of heavy syllables, it will be argued that regardless of alternation between primary stress on nominal prefixes and on roots for verbal prefixes, all heavy Old English prefixes bore some level of stress. In this sense, the Germanic stress-to-weight tendency would assign secondary stress to heavy verbal prefixes, resulting in stress clash across the prefix-root boundary in all word categories, as exemplified in (4).

(4) Lost prefixes: clash of root and heavy monosyllable stress

	*	*				*	*
a.	[and]	[gyt]	'intellect'	b.	[æt]	[ȳ.wan]	'reveal'

In the cases where prefix-weight led to stress clash in Old English, by Middle English the prefix had ceased to be productive. As a result, the fundamental hypothesis that is presented is in line with Molineaux (2012), in claiming that while stress clash was commonplace and acceptable in earlier stages of the language, early English saw the rise of a clash-avoidance constraint, which resulted in the radical restructuring of English prefixation. The motivations, evidence and consequences attached to this hypothesis make up the body of Chapter 7.

While the research ultimately delves into some important theoretical issues in the field, overall, the account is a data-driven one. Consequently, an important section of the section on Early English is dedicated to a corpus study of prefixation in the periods immediately preceding and following the major changes. Based on the type-frequency of prefixes, a repertoire of productive forms is produced for each period, thus effectively establishing a baseline for any account of prefix loss and preservation. With an eye to these two end-states, a prosodic account is built up.

0.3 Theoretical and data issues

Although the main issue investigated in the thesis – i.e. the synchronic and diachronic relationship of stress properties and morphological type – has already been laid out, there are a number of other important issues that are part of the general argument and which should be highlighted.

0.3.1 Evidence for the position of stress

As we have mentioned already, languages vary in terms of the degree of phonologisation of stress, and hence may or may not display segmental processes related to the position of stress. Of course, stress which is multiply cued may be more easy to diagnose, making the prosodic structure of the language somewhat more transparent. In languages that do not show these added positional asymmetries, stress is usually only perceptible through suprasegmental cues.

While the different historical periods of English appear to show these positional asymmetries, as well as the use of stress as a key part in metrical versification, Mapudungun does not seem to display them, hence providing little more than the syntagmatic differences between syllables as evidence for stress position. This said, native

speakers of both languages have clear intuitions as to the position of prominences in words.

In the case of Mapudungun, the fact that all speakers are bilingual in Spanish, as well as the fact that there are some alternations in the position of stress in vowel-final disyllabic nouns (cf. **??**), leads to some questions as to the firmness of these intuitions. Overall, even though native intuitions on stress are unavoidable in the investigation of stress position, efforts can be made in order to clarify what the actual source of the intuition is, and how consistent and 'native' it may be said to be. This is precisely the point made by Hualde and Nadeu in a recent article:

> We take the position that an intuition or perception of prominence (like a grammaticality judgment) is a datum to be explained. Data from intuition are worthy of attention to the extent that they are consistent among speakers of the language. When this is the case, we should investigate the source of the intuition. (Hualde & Nadeu forthcoming: §1)

Our exploration of the acoustic correlates of Mapudungun native stress intuitions, alongside their contrast with non-native ones attempts to provide precisely this type of explanation. From a methodological standpoint, the high levels of agreement of native and non-native perceptions also allows us to have greater confidence in the early accounts of stress which were all produced by European missionaries or scholars.

0.3.2 Stress domains and cyclicity

One of the major issues that the thesis deals with is that of domains for stress assignment. While it has been mentioned that Mapudungun appears to change the boundaries of the stem-domain over time, synchronically, strategies to highlight the stem domain in the context of clash are also visible. One of the key issues here re-

lates to the fact that derived stems in PDM always bear maximal prominence, while underived ones are usually stressed to a lesser degree than the word-edge stress.

Although the details of the analysis must wait until the data is presented in full, the general idea is foreshadowed here. As verbal stems receive final stress, and stem-extending suffixes are always monosyllabic, it is proposed that stem-stress is cyclically assigned, thus stressing the final syllable first of the underived and then of the derived stem (5.a-b). In order to resolve the adjacency (clash) of the two stresses, the rightmost is promoted to a level of prominence that cannot be matched by the stress which is assigned at the word level (5.c-d).

(5) Example derived and underived stem-domain (S) stress:

Underived -stem	>	Derived-stem, clash (unresolved)	>	Derived-stem, clash (resolved)	>	Word stress added
				*		*
*		* *		* *		* * *
a. [kon]$_S$ ‘enter-’	b.	[kon]$_S$-ił]$_S$ ‘enter-CAUSE’	c.	[[kon]$_S$ -ił]$_S$ ‘enter-CAUSE’	d.	[[[kon]$_S$-ił]$_S$-a-j]$_\omega$ ‘enter-CAUSE-FUT-IND.3S’

The ultimate result is that the stem level in PDM is built cyclically, a state of affairs that may be explained following the main tenets of the theory of Lexical Phonology (Kiparsky 1982, 1985; Mohanan 1985). Cyclicity within a single level of the morphology, however, is not accepted in the otherwise similar approach of Stratal Optimality Theory (Kiparsky 2000, 2008, Bermúdez-Otero 2011, in preparation). We therefore follow the rule-based theory throughout our analyses of PDM (see §4.5.1.2).

The claim of cyclical stress assignment, of course, is a familiar one in the Generative tradition, particularly for the phonology of English (cf. Chomsky & Halle 1968; Halle & Keyser 1971; Lieberman & Prince 1977; Halle & Vergnaud 1987b; Kager 1989 among others). In such accounts, nevertheless, it is rhythmic alternation of stress that

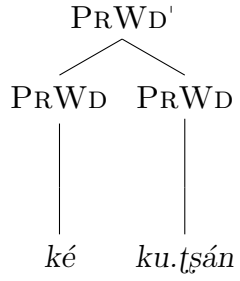
is preserved through clash-avoidance in the cyclic re-application of stress rules. For Mapudungun, the claim is that cyclicity reinforces the morphological role of stress in the language.

0.3.3 Recursive prosodic words

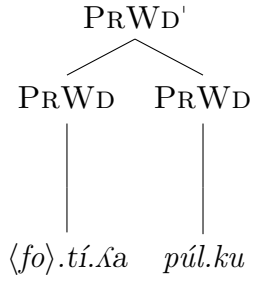
Both for the analysis of Mapudungun and Early English we encounter cases where the evidence points towards certain elements of the morphology acting as independent prosodic words with regards to particular phenomena, but not to others. This is the case, specifically, for individual nominal elements within Mapudungun compounds and for prefixes that are minimally bisyllabic (i.e. that meet the minimal word constraint) in Old and Middle English. We propose that these types of structures constitute recursive prosodic words (van der Hulst 2010; Revithiadou 2011).

In the case of PDM, nominal compounds are characterised by the need to stress subordinate nominals unless they present clash. This is the case even if such stress implies stressing a sub-minimal foot, or a syllable that would otherwise be extrametrical (6.a). Furthermore, the second subordinate noun is not the target of initial extrametricality (6.b), where this position is avoided in the first element (6.c).

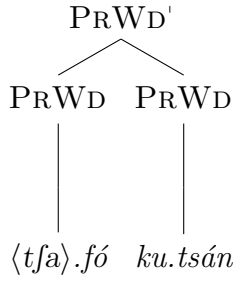
(6) Mapudungun compounds as recursive prosodic words (right-aligned moraic trochees and initial extrametricality)

a. 

'liver-disease'

b. 

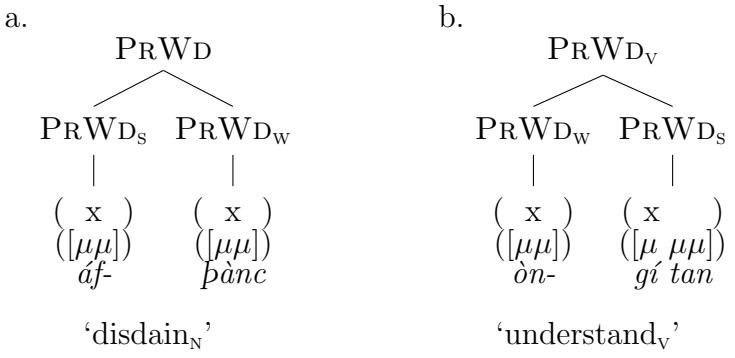
'bottle-wine'

c. 

'cough-disease'

For Old English, following Minkova (2008: 32-33), minimally bimoraic nominal prefixes are fully fledged, stressed prosodic words. This claim is furthered by the fact that there is no resyllabification across the prefix-root boundary (*ibid*: 28). In the case of verbal prefixes, the claim is that – although non-alliterating – these would have borne secondary stress if they fulfilled the minimal word condition. As a result, the superordinate prosodic word would be sensitive to word category, with main stress being assigned to the leftmost subordinate PrWd in nouns (7.a) and to the rightmost one in verbs (7.b).

(7) Old English prefixed nouns and verbs as recursive prosodic words



Further issues are also explored in relation to the notion of the prosodic word and its relation to morphological type. This question is particularly interesting as regards polysynthesis, where all the verbs' arguments are marked or incorporated into the verb-form, making it possible for a full sentence with a number of arguments to be a single word.

0.3.4 Extrametricality and edge-markedness

One of the more contentious elements of the analysis presented here for PDM stress assignment relies on the fact that stress rarely falls on the initial syllable of words and, hence, the language may be considered to display initial syllable extrametricality

(cf. §4.2.3). Theoretical work on extrametricality, though originally not restricted to a particular word edge (Lieberman & Prince 1977; Nanni 1977; Hayes 1979, 1982; Halle & Vergnaud 1987a), has since shown there is a clear preference for systems with final extrametricality (cf. Hayes 1995; Prince & Smolensky 1993). This 'edge-markedness' of extrametricality has been taken a step further by a number of theoretical accounts – particularly in the context of OT-based stress-typologies – in order to claim that extrametricality is restricted to the word's right edge alone (Hyde 2001, 2002; Hyde et al. 2012; Kager 2005, 2012; Alber 2005).

In a review of the crosslinguistic data (§4.2.3.2), as well as the motivations within Mapudungun itself for its inclusion (§4.2.3.1), it will be claimed that banning left-edge extrametricality from prosodic inventories leads to unnecessary complexity. Although there are unattested patterns of foot and left-edge extrametricality interaction (cf. Hyde 2002; Altshuler 2009; Kager 2012), this will be considered insufficient grounds to exclude the structure altogether from possible grammars.

0.4 Goals:

Although the partial goals of the thesis are all subordinate to developing its central hypothesis, each one of these has independent value, providing advances in the documentation and analysis of specific phenomena.

(8) Goals and hypotheses

- Main goal
  - To provide an account of the relationship of morphological structure and prosody – specifically stress – both synchronically and diachronically, with reference to Mapudungun and Early English.

- Main hypotheses
  - The role of stress and its specific properties are linked to the morphological type of a given language.
    - Where the morphology plays a larger role in the linguistic system overall (polysynthesis) and is more clearly decomposable into individual items of meaning (agglutination), stress has a predominantly functional role, being subordinate to the transparency of morphology.
    - Where the morphology tends to group items of meaning into single undecomposable units with a pre-imposed prosodic structure (fusion), stress has a predominantly structural role, regularly superseding the morphology's form.
    - Diachronically, this hierarchical organisation leads changes to occur predominantly within the subordinate system.
- Specific goals
  - To give a new, evidence-based account of stress in PDM, taking into account the incidence of morphological structure.
  - To assess the historical data for Mapudungun stress and morphological structure, proposing synchronic stress assignment systems for distinct stages in the language.
  - To propose a path of diachronic development of the interaction between stress and morphological structure in the 400 years of attested Mapudungun.
  - To investigate the prosodic conditions for native prefix loss and preservation in Early English.
  - To situate the role of stress within the synchrony and diachrony of Early English, with particular reference to morphological structure.
  - To compare and contrast the synchronic and diachronic role of stress vis-à-vis morphology in Mapudungun and Early English.

0.5 Structure of the thesis

The thesis is divided into three parts, mostly on the basis of the proposed case studies.

Part I deals with Mapudungun, first laying out some background on the language's context, speakers and linguistic structure (Chapter 1). This is followed by a review of

previous accounts of PDM stress (Chapter 2). Chapter 3 goes on to present and organise the new data for the interaction of stress and morphology. The analysis of this data, and the proposals for stress assignment and morphological structure are presented in Chapter 4. Finally, Chapter 5 surveys the historical data for Mapudungun, identifying three distinct synchronic stress assignment systems, and proposing a transition from one to the next and on to PDM.

Part II deals with the question of changes in the morphoprosody of Early English. While Chapter 6 gives a general overview of Old and Middle English and the effects of stress on morphological change therein, Chapter 7 (an extended version of Molineaux 2012), presents new corpus data and analysis for the prosodic conditions of prefix loss and preservation.

Part III is made up solely of Chapter 8, which presents a more general comparison of the two studied languages, proposing some logical and possibly typological correspondences between morphological type and a language's stress properties. Finally, a more general case is made regarding the hierarchy of prosodic and morphological structure in languages and its consequence for change and preservation within their grammars.

Part I

Mapudungun Stress Assignment:

Synchrony and Diachrony; Prosody and Morphology

Chapter 1

Mapudungun: *an introduction*

1.1 The language and its speakers

Mapudungun (also Araucanian[1], Mapuche or Mapuchedungun) is the ancestral language of the Mapuche ethnic peoples of south-central Chile and Argentina. At the arrival of the first Europeans in the middle of the sixteenth century, the Mapuche were a loosely federated nation made up of small, mostly sedentary, clan-like extended family groups. Their number in the sixteenth century is estimated at around one million (see Bengoa 2000: 14).

The northernmost Mapuche, in the areas near present-day Santiago, were strongly influenced by the Quechua-speaking Inca Empire, borrowing from it irrigation techniques, crops and livestock, alongside lexical items related to agriculture and administration (Salas 2006: 23-31). The southernmost groups extended to the island of Chiloé

[1]Araucanian (or *araucano* in Spanish) was the name given to the native peoples of Chile and their language upon the *conquistadores*' arrival. It has, however, been rejected both by indigenous organisations and academics in favour of the endonym Mapuche 'land people', to designate the people, and Mapudungun 'land speech', to designate the language (sometimes spelled Mapuzungun, ⟨d ∼ z⟩ standing for IPA [θ]). The origins of the word *araucano* are debated, sometimes assumed to be a Spanish demonym based on a Mapuche place name, such as *rag ko* 'muddy water'. It has also been suggested that the word derives from Quechua *purum awqa* 'savage enemy', as the Mapuche were in a more or less continuous state of war with the Inca Empire (Zúñiga 2006b: 29).

Figure 1.1: Distribution of Mapudungun at the time of European arrival (1541). Based on Adelaar & Muysken (2004: 503)

in what is today Chile's 10th Region. They occupied the coastal areas, as well as the central valley and the western slopes of the Andes, spreading across the mountain range during the time of Spanish invasion to occupy large areas of the Argentine pampas. Here they merged with other groups, either through alliance or conquest, sometimes taking on features of local tongues – such as Tehuelche (Chon) in the case of the Mapuche of the Chubut province (cf. Fernández-Garay 1991; Díaz-Fernández 2011) – but mostly continuing to speak closely related dialects of Mapudungun.

The Mapuche fought the *conquistadores* bitterly throughout the first century of Spanish invasion, forcing them to capitulate and establish a peace treaty. The treaty of Quilín (1641) gave the natives dominion over the lands stretching from the Biobío river south to the Toltén river (the region known as *La Araucanía*, *La Frontera* or *Wallmapu*[2]). Although the terms were often violated, the region remained the main Mapuche stronghold throughout the colonial period. It was not until the 1880s – well after Chilean independence from the Spanish crown (1810) – that a powerful military force took hold of these lands in the name of the Chilean state, decimating the population through battle and disease, in what was paradoxically known as the 'pacifying of Araucanía'. The remaining Mapuche were placed on reservations, where their traditional lifestyle could no longer be practised. Today, many Mapuche people live in such *reducciones*, farming traditionally, or have migrated to cities such as Santiago and Temuco. In the vast majority of cases, the Mapuche live in conditions of extreme poverty, as well as stigmatisation and social discrimination (cf. Irarrázaval & Morandé 2007; Smeets 2008; Cerda 2009).

The period of relative autonomy of the Mapuche territories did not preclude, however, sporadic contact between the natives and the Spanish-speaking colonists, or later, the independent Chileans. Commerce was one of the main vehicles of such interactions,

[2] *Wall-mapu* 'surrounding lands' is the preferred term today among the Mapuche people, in particular in the context of present-day struggles surrounding territorial demands and political autonomy.

the Mapuche economy having shifted to herding after the introduction of sheep, cows and horses. The second source of intense contact was religion, the treaty of Quilín allowing for Christian priests to establish missions in the Araucanía region.

The Mapuche language was first formally described by one such missionary, Father Luis de Valdivia, albeit almost half a century before the treaty was in force. The grammar, published in Lima in 1606, held that 'no other language than this runs down from the city of Coquimbo and its surroundings to the island of Chiloé and beyond, and from the foot of the great snow-covered mountain-range to the sea' (Valdivia 1606: 'To the reader'). Mapudungun is portrayed as a mostly homogenous language, with some regional variation in its vocabulary, though 'the precepts and rules of this art are general for all the provinces' (*ibid*).

Whether Valdivia's assessment is correct or not, the past 400 years have seen drastic changes both in the language's geographic distribution and range of use. Today Mapudungun is spoken mostly in pockets of Chile's 8^{th}, 9^{th}, 14^{th} and 10^{th} regions by an estimated 144,000 speakers (Zúñiga 2007a). Monolingualism is virtually extinct, with the range of interlocutors and topics for the use of the language having grown progressively smaller, and the majority of speakers being elderly and living in traditional, rural communities (Gundermann et al. 2008; Zúñiga 2007a). Even in this setting, speakers are estimated to use the language to address children in no more than 8.2% of cases, while in urban settings a mere 0.8% of speakers tend to do so (CEP). Census numbers in Argentina are much smaller, with just over 8,400 self-reported speakers (INEC).

The language's regional dialects are relatively similar to each other (see Salas 2006; Lenz 1895-1897; Croese 1980, 1985). *Huilliche* (Dialect VIII in Croese's 1980 dialectological survey), the southernmost variety (also the least robustly preserved), is considered the furthest outlier (cf. Alvarez-Santullano Busch 1992), being used around Lake Ranco and the costal areas near Osorno, as well as towards the southern tip of the island of

Chiloé. Usually referred to simply as *Mapuche* or *Mapudungun*, the central branch of the language (*Moluche*, in Lenz's 1895-1897 terminology, Dialects III, V, VI and VII), is spoken in the Mapuche heartland: the central valley and costal areas south of the city of Victoria in Chile's Araucanía and Los Ríos regions (known as *Lafekenche* in costal areas – Dialect V). Although the central variety is the basis of most contemporary linguistic descriptions, it differs only slightly from *Pehuenche*, spoken in the Andean foothills surrounding the Biobío river (Dialect IV). Finally, *Picunche*, in the northernmost Mapuche territories, spreads over the Nahuelbuta mountain range into the central valley, and the mountainous areas of the Malleco province, south of the Biobío (Dialects I and II)[3]. This final variety, quite poorly preserved, appears further removed from the core Moluche-Pehuenche varieties, but not so much as Huilliche. It seems, nevertheless, that Picunche may be the source of Argentinian varieties of Mapudungun, as they share phonological features (such as voicing in fricatives [v] and [ð]), as well as specific lexical items (Fernández-Garay 1991). East of the Andes, the Mapuche's independent migrations, as well as government-relocation, has led them to congregate in the province of Neuquén, though there are additional communities in the provinces of Buenos Aires, Chubut, La Pampa and Río Negro (cf. Adelaar & Muysken 2004: 510).

The genetic affiliation of Mapudungun is uncertain. A number of claims have been made, ranging from relation to near-neighbours to the north – such as Quechua, Aymara (Englert de Dillingen 1936) and Pano-Tacanan (Loos 1973; Key 1978, 1981) – and to the south – Kawésqar, Yaghan and Chon (Tierra del Fuego, now extinct – Greenberg 1978; Key 1981) – as well as membership in more distant families such as Arawakan (Payne 1984; Croese 1989, 1991) or Mayan (Stark 1970, but see Hamp

[3]The terminology here has been mostly passed down from Lenz (1895-1897): *tʃe* 'people'; *wiʎi* 'south'; *molu/ŋolu* 'west'; *pewen* 'araucaria tree' (the 'monkey-puzzle' tree, typical of the southern Andean foothills); *pikun* 'north'; *l̪afken̪* 'sea'; *mapu* 'land, country'.

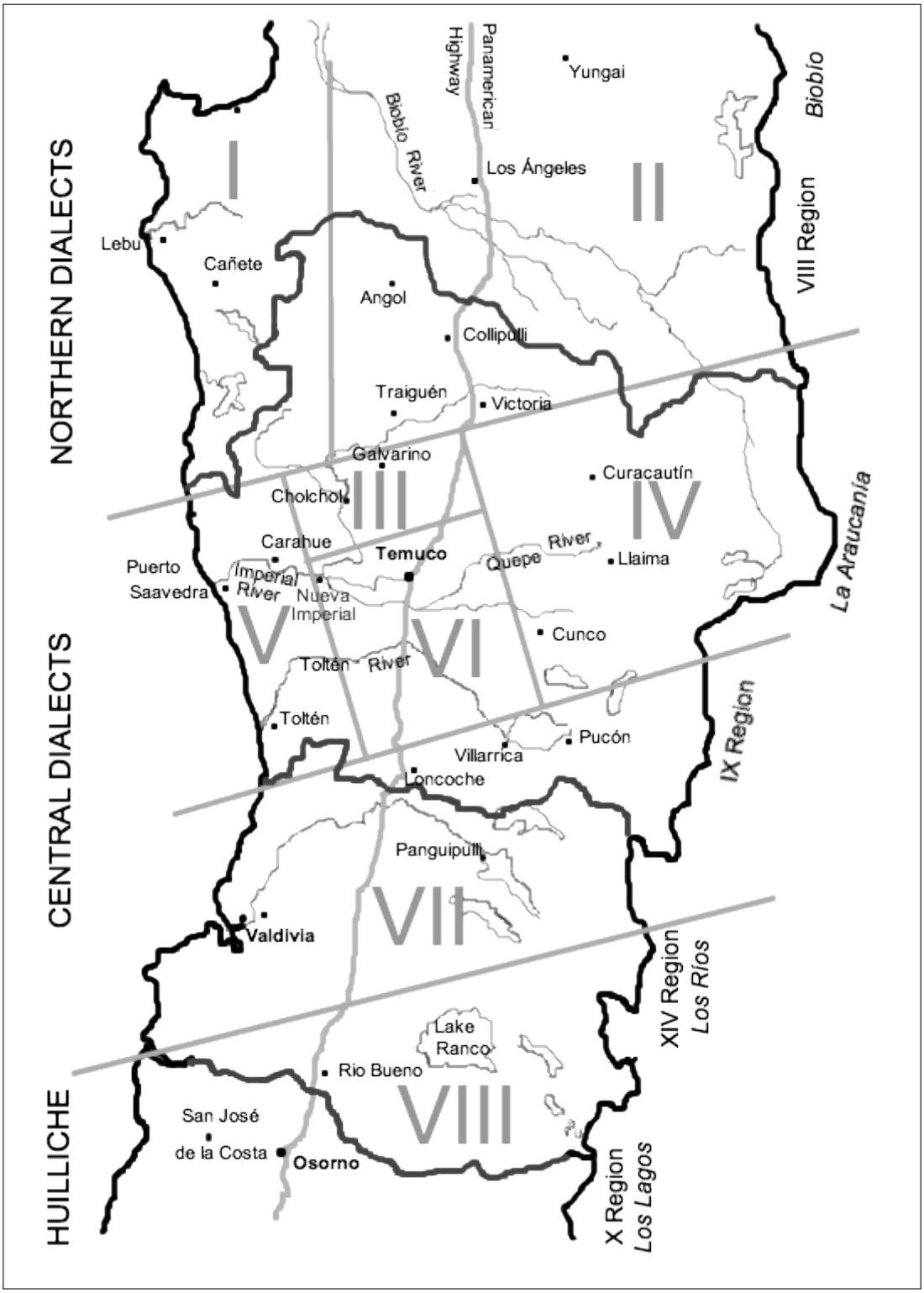


Figure 1.2: Mapudungun dialectal distribution, according to Croese (1980) p.38.

Figure 1.3: Present day distribution of Mapudungun in Chile and Argentina. Based on Adelaar & Muysken (2004: 504)

1971; Campbell 1997: 207), Aztec and Uto-Aztecan (Key 1981). With strong evidence lacking for any of these theories, the language is often presumed to be an isolate (Lenz 1895-1897; Kaufman 1990; Campbell 1997). From a regional-typological perspective, however, it can be grouped with other Andean-type languages with agglutinating, strictly ordered morphology (Tovar & Larrucea 1984; Greenberg 1978; Salas 2006), with a special affinity towards Quechua and Aymara, as far as the tendency for suffixation goes (Adelaar & Muysken 2004: 517-8).

1.2 Linguistic structure

1.2.1 Phonology

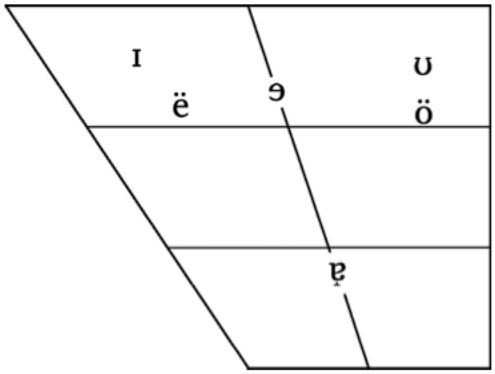
1.2.1.1 Segmental inventory

The phonemic repertoire of the language traditionally includes the five canonical vowels [i, e, a, o, u], as well as an additional high, mid or back, unrounded one, [ɨ] or [ɯ].[4] This 'sixth vowel' appears in complimentary distribution to [ə], which, in most accounts, occupies unstressed positions (Lenz 1895-1897; Suárez 1959; Echeverría 1964; Echeverría & Contreras 1965; Salas 2006; Zúñiga 2001, 2006b, 2007b; Smeets 2008). Further acoustic analyses of the vowels by Catalán (2012) find only minimal differences between the first five vowels of Mapudungun and the five vowels of the Spanish spoken in the city of Valdivia (Chile) as described by Cepeda et al. (1995). A more recent, detailed study by Sadowsky et al. (2013) finds Mapudungun vowels to be far more

[4]In earlier grammars and dictionaries (Augusta 1903, 1916; Erize 1960), this vowel was often described as French or German [y], and is still written in most cases as ⟨ü⟩, which, of course, creates some confusion. Zúñiga (2006b) and Sadowsky et al. (2013) report the vowel surfacing as central [ɨ], rather than back. Lagos (1981: 48-9) identifies the vowel as having a drop in F2 which he takes to be a sign of backness. Alvar et al. (1997) find some acoustic evidence for the vowel's similarity to Tokyo-Japanese [ɯ], while Catalán's (2012) study places it half way between central and back, designating it as 'semi-posterior'.

mid-centralised than the canonical ones,[5] with the stressed variants being equivalent to IPA [ɪ ë ɐ̈ ö ʊ ə], and the unstressed ones to [ɪ̈ ë̈ ɜ ö̈ ʊ̈ ɨ̈] (where double dots signal centralisation).[6]

Figure 1.4: Mapudungun (stressed) vowel chart, Sadowsky et al. (2013).



Interestingly, this distribution of Mapudungun vowels seems very similar to the vowel space of Chilean Spanish (in particular the dialect of Concepción), which Sadowsky (2012b) also finds to be extremely mid-centralised as opposed to other varieties of the language, both New and Old World. In this sense, the fine-grained phonetics of Chilean Spanish's vocalic system may well be the result of the long-term contact of the two languages (a view put forth by Sadowsky 2012a, 2013).[7]

As for the sixth vowel, Catalán (2012) identifies correspondences with either [ɨ] or [ə] in individual tokens, but finds an overall lack of consistency in the stress patterns

[5]In stark contrast to these conclusions – at least for high vowels – is the claim put forth by Salas (1976: 62, 1978a: 144) that Mapudungun high and mid vowels are 'closer' than those of Spanish. Although dialectal and historical differences may account for this difference, it is also likely that the differences arise from Sala's more impressionistic data, as opposed to Sadowsky *et. al*'s instrumental approach.

[6]The variety of Mapudungun examined for the study was that of Isla Huapi, near Puerto Saavedra, in Chile's 9th Region, which belongs to the central Mapudungun dialect, described by Lenz (1895-1897) as 'Moluche' and by Croese (1980, 1985) as 'Dialect V' (see Fig. 1.2). Present day Mapuche would refer to this group as *Lakenche*, 'sea-people'.

[7]We note that this type of interpretation follows the tradition of *indigenist* theories regarding the origins of New World varieties of Spanish. In particular, the *rephonetisation* of Chilean Spanish vowel-system under the influence of Mapudungun (cf. Sadowsky 2012a, 2013) is in the spirit of Rudolf Lenz's work, who claimed that 'the Spanish of Chile is basically Spanish with Araucanian [i.e. Mapudungun] sounds' (Lenz 1893: 208, see §5.4.2.1).

of her data, remaining inconclusive as regards its conditioning of the alternation. A very brief acoustic study by Alvar et al. (1997) was also unable to relate stresslessness to [ɨ]-centralisation. Finally, as noted above, Sadowsky et al. (2013) find the opposite distribution of allophones, with [ə] in stressed syllables and [i̞] in unstressed ones. The inconsistency of all of these accounts has ultimately led us not to consider vowel quality as a reliable source of information for the position of stress. From a practical standpoint, we follow general convention – and systematic phonological distribution[8] – by transcribing the vowels as ⟨i, e, a, o, u, ü⟩, the final vowel understood to be high-central or back and unrounded, in alternation with schwa.

The central variety of the language has also been claimed to have nineteen consonants, realised in seven different places of articulation (see Table 1.1, after Salas 1976, 1978a, 2006; Zúñiga 2001, 2006b,a, 2007b and Sadowsky et al. 2013). The inventory is completed by three glides: labio-velar [w], alveolo-palatal [j] and velar [ɯ̟].

Table 1.1: Mapudungun consonants

	Bilabial	Labio -dental	Dental	Alveolar	(Alveolo-) Palatal	Retro-flex	Velar
Stop/affricate	p		t̪	t	t͡ʃ	t̪͡s̪	k
Fricative		f	θ	s	ʃ		
Nasal	m		n̪	n	ɲ		ŋ
Liquid			l̪	l	ʎ	ɻ	
Approximant	w				j		ɯ̟

Laryngeal features (such as aspiration and voicing) are non-contrastive. All obstruents are voiceless in central varieties of the language (but see Lenz 1895-1897; Echeverría 1964; Echeverría & Contreras 1965; Sánchez 1989; Salas 2006; Sadowsky et al. 2013 for voicing in other dialects). There is regular aspiration of stops, although the default seems to be for more lenis than in English, for example (Sadowsky et al. 2013:

[8] A formal, feature-based account of the phonological distribution of the Mapuche vowels is given in Rivano (1990).

89). Also, palatalisation – especially of [s] to [ʃ] – is commonplace, usually carrying an affective meaning. Salas (2006: 79-80) compares the semantic/pragmatic effects of such palatalisation with some cases of the Spanish diminutive. Affective palatalization may also occur in some cases with [ɻ] and [l̪].

(1.1) Palatalisation and affective implications (Salas 2006):[9]

kuse = Sp. 'anciana' / 'old lady'	*naɻki* 'cat'	*pal̪u* 'aunt'
kuʃe = Sp. 'ancianita' / 'little old lady'	*naʃki* 'kittie'	*paʃu* 'auntie'

Observations vary as to the nature of the rhotic, but all descriptions provide the retroflex form [ɻ] as an allophone, either alongside alveolar [ɹ] (Salas 2006; Zúñiga 2006b) or the retroflex fricative [ʂ] and the retroflex lateral [ɭ] (Sadowsky et al. 2013). Alternation between [t͡ʂ] and [tʰ], and [ɯɻ] and [ɣ] also seem common (Salas 2006: 66-7).[10] Finally, although contrast between dental [t̪, n̪, l̪] and alveolar [t, n, l] is said to occur only in very careful articulation of more traditional speakers (Zúñiga 2006b: 59), Sadowsky et al. (2013) find paletographic evidence for their contrast among speakers of central Mapudungun. Salas (2006: 81-2) further speculates that presence or absence of the contrast correlates to dominance of Spanish or Mapudungun in each individual's linguistic proficiency.

Spelling conventions are multiple and choice thereof is affectively laden (see Zúñiga 2001), but generally, where the IPA symbol is not used, the equivalences in Table 1.2 may be found. This thesis strives to use phonetic script as much as possible. Otherwise, the first of the listed orthographic variants is used.

[9] Family relations have a much more complex structure than English, especially as regards gender. *pal̪u* refers, specifically to a male's paternal aunt.

[10] In the dialect described by Sadowsky et al. 2013, the retroflect africate [t͡ʂ] alternates with apical, post-palatal [t̻͡s̻] and [t̻ʰ] (use of underdot follows Ladefoged & Maddieson 1996), while [ɣ] seems to be the main allophone for cognates that in Salas's (2006) and Zúñiga's (2006b) descriptions are given with [ɯɻ].

Table 1.2: Spelling variants in Mapudungun

⟨ɨ⟩	/⟨ü⟩ ⟨ï⟩ ⟨ɯ⟩ ⟨v⟩ ⟨ə⟩	/θ/	⟨d⟩ ⟨th⟩ ⟨z⟩	/j/	⟨y⟩ ⟨i̯⟩
/w/	⟨hu⟩ ⟨u̯⟩	/ʃ/	⟨sh⟩	/ʎ/	⟨ll⟩ ⟨j⟩ ⟨lh⟩
/t̻/	⟨t⟩ ⟨t̯⟩ ⟨t·⟩	/t̻s̻/	⟨tr⟩ ⟨č⟩ ⟨x⟩ ⟨tx⟩	/ɲ/	⟨ñ⟩
/n̻/	⟨n⟩ ⟨n̯⟩ ⟨n·⟩	/tʃ/	⟨ch⟩ ⟨č⟩ ⟨c⟩	/ɯ̨/	⟨g⟩ ⟨q⟩
/l̻/	⟨l⟩ ⟨l̯⟩ ⟨l·⟩	/ŋ/	⟨ng⟩ ⟨g⟩	/ɻ/	⟨r⟩ ⟨ɽ⟩ ⟨z̨⟩

1.2.1.2 Syllabification

Syllabic structure in the language is fundamental to the data and analyses presented in upcoming chapters (§2, §5). Here we follow Echeverría (1964); Salas (1976, 1978a, 2006); Zúñiga (2006b), who present the most detailed accounts. The minimal requirement for a syllable is a vocalic nucleus, with all vowels able to stand alone as a syllable. All consonants may occupy the onset position, but only the sonorants and fricatives may be codas. No consonant clusters are permitted either in the syllable onset or in the coda.

(1.2) Possible Mapudungun syllables (C_1 = any C; C_2 = sonorants and fricatives):

V	C_1V	VC_2	C_1VC_2
i.lo 'meat'	**ɻu**.ka 'house'	**an**.tu 'day'	**man**.sun 'ox'

Finally, glides are distributed as other sonorant consonants, but for the fact that [ɯ̨] never surfaces word-initially. In very careful articulation, however, the vowels [i, u, ɨ] may be preceded by homorganic on-glides [j, w, ɯ̨] word-initially. [ɯ̨] may also follow word-final [ɨ] as an off-glide (cf. Salas 2006: 64-5).

In fast speech, a series of more than one vowel where one is high – normally syllabified separately – may be pronounced as a single syllable, the high vowel being realised as a glide. Some alternation also occurs in mid-vowels: a final post-vocalic [o] may also surface as [w], and the series [ew] may become [u] (see Salas 2006: 72).[11]

[11]Note that in examples in 1.3, lexical words (i.e., not *fejmew*) do not reduce final closed syllables or penultimate vowels followed by an open syllable. Crucially, as we shall see further on (§4.1.1), this is the locus of stress for morphologically simple words.

Table 1.3: Glides, underlying and surface

(Full) Semi Vowels		On- and Off- Glides	
ONSET	CODA	WORD INITIAL	WORD-FINAL
jaʃ	*aj.wi.ɲ*	*ʲi.lo*	—
'man's offspring'	'shadow'	'meat'	
wiŋ.ka	*lew.fɨ*	*wule*	—
'foreigner'	'rover'	'morning'	
—	*naɯɻ*	*ɯɨʌtʃa*	*kolɨɯ*
	'low'	'girl'	'maroon'

(1.3) Syllabic reduction in fast speech (see Salas 2006: 72):

ʦa.pi.al	∼	*ʦa.pjal*	'mountain lion'	*pu.el*	∼	*pwel*	'east'
tʃa.o	∼	*tʃaw*	'father'	*e.pe.o*	∼	*e.pew*	'story'
fey.mew	∼	*fey.mu*	'then'				

In the case of successive homorganic vowels – which only occur at morpheme boundaries – there is also a robust process of glide insertion (Salas 1976: 152, 1978a: 72, Rivano 1990: 138). The place of articulation of the glide is apparently determined by that of the following vowel.

(1.4) Intervocalic glide insertion:

a. /ʦipa-a-n/ → [ʦipajan]
'exit-FUT-IND.1S'

b. /pu-u-n/ → [puwun]
'there-come-IND.1S'

c. /kon-l-i-u/ → [konliju]
'enter-SUBJ-1-D

The status of full vowels and glides becomes particularly interesting when we examine the verbal system, where the interplay of underlying segments and surface vowels and glides plays a key role in syllabification and weight of the final syllables of the word (cf. 3.23).

Another similar issue is that of vowel epenthesis. The nature of the epenthetic vowel seems relatively straightforward for present day Mapudungun (hereafter PDM, cf. §5.5.3 for the historical development), corresponding to the phoneme usually spelled as ⟨ü⟩ and which may manifest as [ɨ], [ə] or ∅. The context for the epenthetic vowel is also unambiguous as it tends to be found breaking up a series of consonants that would otherwise form a cluster in either the coda or onset of a syllable.[12] In a number of cases the alternation seems quite free (1.5a, b), while in others, the intervocalic vowel – though surfacing in both the mid-central ([ə]) and high-central ([ɨ]) varieties, does not reduce, and may even be stressed (1.5c, d).

(1.5) Interconsonantal [ɨ]∼[ə], deletion vs. stress:

a. *pɨʌ́í* ∼ *pəʌ́í* ∼ *pʌ́í*
'fly$_N$'

b. *ʈʂipá-j-m-ɨn* ∼ *ʈʂipájmən* ∼ *ʈʂipájmn*
'exit-IND.1S'

c. *n̻amɨ́n̻* ∼ *n̻aməń̻*
'foot'

d. *lef-ɨ́n* ∼ *lefə́n*
'run-IND.1S'

Clearly, although the forms of the type represented in 1.5 (a) and (b) can be considered to be surface epenthetic vowels, cases such as (c) and (d) cannot, as they interact with stress and are not fully optional. Importantly these two patterns are not easily teased apart in the contemporary data, and, furthermore, appear to favour the first pattern the further back we look in the language's history (see Chapter 5).

[12] Echeverría (1964: 45) and Echeverría & Contreras (1965: 134) present the issue as one of vowel reduction and deletion, which seems to be based on the form's lack of stress. However, the only example they give is of reduction in a syllable which they predict would not bear stress on the surface anyways ([kɨθáw]∼[kθáw] 'work'). The crucial question has to do with whether a syllable which is predicted to have stress on the surface, is found to actually lack stress on the surface (i.e. [n̻amɨ́n̻]∼*[n̻ámn̻]).

Other aspects of the interaction of stress, morphology, vowel/glide alternations and epenthesis are dealt with in detail in the following chapters. For now, we mention only that throughout the more recent historical evidence for the language's stress system, the difference between open and closed syllables – especially at the right edge of the word – appears to be crucial.

1.2.1.3 Intonation

The general features of Mapudungun intonation seem rather uncontroversial, following Echeverría (1964: 49-50), Echeverría & Contreras (1965: 134-5), Salas (1976: 85-6), 2006: 75 and Zúñiga (2006b: 253-4). Statements and WH-questions tend to have falling intonation, while questions with no WH-particle have rising intonation. According to Echeverría and to Echeverría and Contreras, before a minor syntactic break, a small rise may be seen on the final syllable of a word.

(1.6) Intonation patterns in Mapudungun utterances:[13]

a. *wiɨle* *mawiɨn-a-j*↘ Echeverría (1964: 50)
tomorrow rain-FUT-IND.3
'it will rain tomorrow'

b. *tʃem* *kiɨpa-l-i-m-i*↘ Salas (2006: 75)
what come-CAUSE-IND-2-S
'what did you bring?'

c. *wiɨt̻se-j-m-i* *kaj*↗ Echeverría & Contreras (1965: 135)
cold-IND-2-S AFFIRM
'are you really cold?'

d. *aku-l-e* | *elu-a-fi-m-i* *kaj* *kofke*↗ Echev. (1964: 50)
come-SUBJ-3S give-FUT-3SP.IND-2-S AFFIRM bread
'if he comes, will you really give him bread?'

[13]For some interpretations of the affirmative particle *kaj*, found in examples (c) and (d) see Zúñiga (2006b: 258). He suggests the particle is directly related to the conjunction *ka*∼*kaj*, with the post-verbal meanings *what about X?, what if X?, how about X?*.

1.2.2 Morphosyntax

1.2.2.1 The verbal system: polysynthesis and agglutination

Mapudungun is considered a polysynthetic, agglutinating, head-marking language. Insofar as these categories can be considered useful, their fundamental locus of instantiation in the language is the verb, which displays – aside from intricate (obligatory and optional) inflectional morphology – a wide array of derivational and compounding processes. This richness of verbal morphology is in stark contrast with the noun, where, barring compounding (which is highly productive), morphological structure is markedly sparse, displaying no gender and practically no case or obligatory number marking.

The notions of polysynthesis and agglutination, as developed by early American and enlightenment linguistics (cf. Du Ponceau 1838; von Humboldt 1836 *inter alia*), are viewed today with some scepticism since the different 'language types' of traditional typology are gradient, overlapping unpredictably. Nevertheless, they are still employed today as useful descriptive shorthands. Comrie (1989: 42), for instance, points out the idealising nature of these categories, and the need to relativise them in terms of their ability to predict other typological features of the language. He does go on to tell us that a '[i]n a polysynthetic language, or rather in an ideal polysynthetic language, each sentence consists of just one word, this word in turn, consisting of as many morphemes as are necessary to express the intended meaning' (1989: 46). An ideal agglutinating language, on the other hand, is characterised by the fact that that each morpheme expresses a separate item of meaning and that 'the boundaries between morphemes in the word are always clear-cut' (*ibid:* 43). Although, of course, these are extreme claims, they do make certain trends evident in languages.

Mapudungun's verbal system fits broadly into a loose definition of both polysyn-

thesis and agglutination (see, for example Aikhenvald 2007). The nominal morphology of the language, of course, does not fall in with the polysynthetic claims, displaying few derivational processes and no true inflectional morphology. Obligatory verbal inflection, furthermore, includes a few portmanteau morphemes as well as some degree of morpheme fusion (cf. §3.4.1.1, p. 117ff.), a possible sign of typological drift away from the agglutinative pattern.

The language, nevertheless, does fall in well with more restrictive contemporary theories of polysynthesis which relate the morphological type either to the 'ability to incorporate productive noninflectional concatenation.' (de Reuse 2006: 745) or to the parameter by which 'every argument of a head element must be related to a morpheme in the word containing that head' (Baker 1996: 14). The incorporation of non-inflectional material is most clearly exemplified in Mapudungun by NP incorporation and serial verb construction, while head-argument indexation is shown in the language's strict head-marking inverse morphology, as well as NP incorporation (i.e. the inclusion of the NP argument within the head verb).

Nominal incorporation: This phenomenon has attracted significant attention to Mapudungun, in particular as regards the relation of syntax and morphology in the language (Harmelink 1992; Baker et al. 2005; Baker 2009; Baker & Fasola 2009). Speakers have the option of incorporating one of the arguments of the verb into its structure. This may occur either with a single noun (1.7b), or an entire noun phrase (1.7d)[14], the latter being a rare feature among younger speakers (cf. Zúñiga 2006a).

[14]A formal account is provided by Baker et al. (2005).

(1.7) Examples of Mapudungun nominal incorporation (from Zúñiga 2006b: 181)[15]

a. *kaʈ̠ʂ̠i-me-a-j* *katʃu.*
cut-AND-FUT-IND.3S grass
He (she, it) went there to cut grass.

b. *kaʈ̠ʂ̠i-katʃu-me-a-j*
cut-grass-AND-FUT-IND.3S
He (she, it) went there to cut grass

c. *aθkintu-jaw-i-j* *we* *ŋiʎan* *mansun.*
watch-AMB-IND-3S new buy ox
He (she, it) went around watching recently bought oxen.

d. *aθkintu-we-ŋiʎan-mansun-kijaw-i-j*
watch-new-buy-ox-AMB-IND-3S
He (she, it) went around watching recently bought oxen.

Serial Verb Constructions: Two or more verb-roots strung together in order to act as a single predicate, without overt coordination, subordination or dependency marking (Aikhenvald 2006: cf.) are also common in the language, corresponding to what are termed serial verb constructions (SVC).[16] Fernández-Garay & Malvestitti (2008) claim that SVC in Mapudungun ultimately behave as single grammatical and phonological words which may be either asymmetrical – including both open and closed-class roots (1.8a) – or symmetrical – made up of open class roots alone (1.8b) – the first being more common.

[15]Note that in the glossing of (a) and (b) the final morpheme is shown as representing both mood and person. This is probably not a fusinal morpheme, but rather a phonological merger of two underlying high front sonorants, which surface as a single glide [j]. Note that in (c) and (d) the same morphemes are given separately, where they follow a consonant. For reasons we detail later in the account (§3.4), we have modified Zúñiga's transcription to include the final glide. This is the convention we try to follow throughout the presentation of our own arguments.

[16]'...verb stem serialization is, albeit still ill-understood, a recognized word formation processes in the language' (Zúñiga 2010: 211)

(1.8) Mapudungun asymmetrical (a) and symmetrical SVCs (b):[17]

a. *pepi-ɨʈʂɨf-pɨra-m-la-j* *tʃi* *kura* (Zúñiga 2006b: 181)
be.able-throw-ascend-CAUSE-NEG-IND.3 the stone
'He (she, it, they) couldn't throw the stone up high'

b. *ŋɨjŋe-la-j-m-i* (Fernández-Garay & Malvestitti 2008: 43)
be.hungry-die-IND-2-S
'You died of hunger'

Suffixation: Beyond these compounding-type processes (Baker & Fasola 2009), the Mapudungun verb remains extremely rich in its morphological structure and expressive capacity. Smeets (2008: 149) distinguishes at least 100 different verbal suffixes, with independent functions and meaning. She also establishes 36 separate slots based on the relative position of suffixes within the word. Zúñiga (2006b,a) and Salas (2006) distinguish suffixes as marking mood, tense, evidentiality, polarity, directionality, voice, aspect, 'modality in a broad sense' (immediacy of the action, suddenness, broken implicature), as well as person and number of core arguments. Minimally, a finite verb must mark mood, person and number. Tense marking is only explicit for the future (with the suffix *-a*). Where no marking is given, a non-future interpretation is given, usually glossed as the preterite.[18]

Inversion: Key among the language's morphosyntactic peculiarities is its inverse person-marking system, which Baker (2003, 2006) and Baker et al. (2005) link to the language's compliance with the polysynthesis parameter. The fundamental claim to this effect is that all verbal (head) arguments are morphologically marked on – or incorporated into – the head. In such a system (see Salas 1976; Grimes 1985; Rivano

[17]Note that *pepi-* 'be able' and *pɨra* 'ascend, up' are both part of closed-classes of verbal modifiers, the first being usually placed before the 'main' verb-root and having modal or aspectual meanings; the second usually comes after and indicates a spatial relation or movement.

[18]Further details on verbal morphology are given in §3.4.1.1, as well as in Appendix B.

1989; Arnold 1994; Baker 2003; Salas 2006; Zúñiga 2006b; Adelaar 2009; Golluscio 2010), person-marking does not rely on grammatical relations, such as subject/object, but on the semantic roles of 'focal' and 'satellite person' (FP and SP, respectively). In other words, person marking indicates whether the FP in the clause is the agent or the patient and, consequently, what the role of the SP is as well. Evidently, these relations become significant only in clauses with more than one argument.

Furthermore, Salas (1976, 2006: 109-127) has shown that these relations are subject to an 'egocentric' hierarchical organisation, where the first person is the ideal FP, followed by the second person, then by the third person 'central' and finally the third person 'peripheral' (the difference between these last forms is determined only by the context of discourse). In a transitive clause, then, direct marking implies that the form that is higher in the hierarchy is the agent, and the one lower is the patient. In the case of inverse marking, it is the SP (the one lower in the hierarchy) that plays the role of agent.[19]

(1.9) Person marking in Mapudungun, intransitive and transitive direct/inverse forms (based on Zúñiga 2006b: 120)[20]

a. *leli-j-u* (intransitive)
watch-IND.1-D
'We$_D$ watched.'

b. *leli-fi-j-u* (transitive, direct form)
watch-3SP-IND.1-D
'We$_D$ watched him (her, it, them).'

[19]For a detailed generative account of inversion in Mapudungun, see Baker (2003).

[20]In the glosses here and later in the text, the person and number for the FP requires no explicit marking apart from '1,2, 3, S, D and P', but SP person and number marking is followed by 'SP', so as to disambiguate. In the same fashion, direct forms are unmarked in the gloss, while the inverse ones are given the glossing 'INV'.

c. *leli-e-j-u-mew* (transitive, inverse form)
watch-INV-IND.1-D-3SP
'Us$_{D}$, he (she, it, they) watched' or 'He (she, it, they) watched us$_{D}$.'

In sum, Mapudungun can be considered agglutinative insofar as it displays a clear dispreference for phonological or semantic coalescence among morphemes. It is polysynthetic by virtue of its high morpheme-to-word ratio – extensive, productive non-inflectional morphology – as well as abundant indexation or incorporation of arguments within the head constituent.

1.2.2.2 Nominal and adjectival marking

We have noted that, aside from nominal compounding, which is highly productive, nouns are morphologically poor, with no gender and practically no case or obligatory number marking. The only true case marker in the language is the oblique or circumstantial postposition *mew* (also *mu*), which Smeets (2008) considers an instrumental suffix. Depending on the context of discourse and nature of the verb, the particle may indicate place (1.10a), time (1.10b), instrument or means (1.10c), cause (1.10d), circumstance (1.10e), as well as the standard of a comparison (1.10f).[21] More generally, it can be framed as an indirect object marker (1.10g).[22]

(1.10) The oblique/circumstantial marker (examples from Smeets 2008: 62-6):

a. *amu-a-j* *waria* *mew*
go-FUT-IND.3 town POST
'he will go to town'

b. *kɨla* *antɨ* *mew* *kuṭ̱an-fu-n*
three day POS illness-BI-IND.1S
'I have been ill for three days'

[21] See Harmelink (1987) for extensive exemplification on the topic.
[22] For the clitic plural-marker *=ŋɨn* see Table 1.4, below.

c. *anel-tu-fi-n* *kiɲe* *kutʃiʎo* *mew*
threaten-TR-3SP-IND.1S one knife POST
'I threatened him with a knife'

d. *pepi-wiri-la-n* *rume* *wɨʈʂe-le-n* *mew*
be.able-write-NEG-IND.1S very cold-PROG-INF POST
'I cannot write due to it being very cold'

e. *re* *ʎɨka-n* *mew* *mɨle-ke-fu-j=ŋɨn*
only fear-NOM POST be-HABIT-BI-IND-3=P
'they lived only in fear'

f. *Rude* *iɲtʃe* *mew* *ina-n*
Rude I POST next-INF
'Rude [is] the one that comes after me (i.e. younger than me)'

g. *elu-ŋe-n* *θomo* *mew.* (Baker 2003: §3.4)
give-PASS-IND.1S woman POST
'I was given to the woman.'

The only exception to lack of number marking in nouns is that of non-singular animate arguments, which are preceded by the particle *pu*.

(1.11) Pluralisation of nouns in Mapudungun

a. *ʈʂewa* 'dog' b. *pu ʈʂewa* 'dogs' c. *kuɻa* 'stone/stones'

Only a limited number of noun-noun derivations are available in the language. Two such cases are the 'relation' marker *-wen* – used exclusively to mark reciprocal family relations (cf. *fotɨm* 'son' vs. *fotɨm-wen* 'son-REL = father and son') – and the place-name marking suffix *-we* (cf. *kuɻa-we* 'stone-PLACE = place of stones'). Category-changing derivations, on the other hand, are relatively commonplace. The adverb-marker *-tu* is very common, attaching to nouns (cf. *n̻amɨn̻-tu* 'foot-ADV = on foot'), and the agentive *-fe* attaches to verbal roots in order to create nouns (cf. *wejtʃa-fe* 'fight-AGENT = warrior').

However, the key category-changing morphological process in the language is verbalisation – as expected for such a 'verb-heavy' language. Nouns, adjectives and numerals can either be used wholesale as verbal roots (that is, 'zero derived' into verbs, cf. 1.12a-b),[23] or they can take on one of a number of suffixes (Smeets 2008: 121-128; Zúñiga 2006b: 163), among which *-tu* for nouns (1.12c) and *-(n)tu* for adjectives (1.12d) are most frequent.

(1.12) Verbalisation of nouns and adjectives in Mapudungun (Ø and *-(n)tu* marking)

a. *mojo-n*
'breast-INF' (to suckle)

b. *liɨuɋ-j-m-i*
'white-IND-2-S' (you went white)

c. *kofke-tu-j*
'bread-VB-IND.3' (he ate bread)

d. *kiɨme-tu-n*
'good-VB-IND.1S' (I was good)

Adjectives, which form a relatively small word category in the language (cf. Augusta 1903: 18), do not mark gender or case either, however, they do mark non-singular forms, which take the suffix *-ke*.

(1.13) Pluralisation of adjectives in Mapudungun

a. *ŋiɨmi ɻajen* 'fragant flower' b. *ŋiɨmi-ke ɻajen* 'fragrant flowers'

Both pre- and post-positions are used in the language to modify the NP, among the former are the non-singular marker *pu* and its homophone with the meaning 'in/within', as well as *ina* 'along/next to', *miŋtʃe* 'under' and *wente* 'above'. There are two post-positions, the most common being the oblique marker *mew*, although *piɨle* – with the meaning 'towards/around' – is also widely used.

[23] Whether there is an actual underlying zero morpheme (∅) in these cases is unclear and does not seem relevant to our own purposes.

1.2.2.3 Pronominal system

Pronouns mark first, second and third person, as well as singular, dual and plural number. The third person, however, has no purely pronominal form, but uses the demonstrative form *fej*, which can also be further specified by the clitic forms *eŋu* (dual) and *eŋɨn* (plural).

Table 1.4: Personal Pronouns (free-standing)

	Singular	Dual	Plural
1st Person	iɲtʃe	iɲtʃu	iɲchiɲ
2nd Person	ejmi	ejmu	ejmɨn
3rd Person	fej	fej=eŋu	fej=eŋɨn

In the case of the third person pronouns, the clitic element, though optional, may appear attached to the right edge of either the demonstrative or of the verb (see 1.14). As a general pattern, the use of the clitic person/number marker appears to be on the rise as a result of contact with Spanish, where these features of the subject are very clearly signalled in verbal inflection.

(1.14) Pronominal and post-verbal 3rd person non-singular marking:

a. *fej=eŋɨn ʈ̪ʂipa-j*
DEM=P exit-IND.3

b. *fej ʈ̪ʂipa-j=ŋɨn*
DEM exit-IND.3=P

Pre-nominal possessive pronouns are also widely used. However, the fact that the form of all third person markers is identical to the first person singular (Table 1.5), often requires further specification of the possessor.

Table 1.5: Possessive Markers (pre-nominal)

	Singular	Dual	Plural
1st Person	ɲi	ju	iɲ
2nd Person	mi	mu	mɨn
3rd Person	ɲi	ɲi	ɲi

Possessive markers may be further specified either by a preceding pronoun or noun.

(1.15) Examples of ambiguity and disambiguation for possessive pronouns

a. *ɲi kura*	b. *intʃe ɲi kura*	c. *Juan ɲi kura*
'my/his/their stone'	'my stone'	'Juan's stone'

1.2.2.4 Word order

Although the language has alternatively been claimed to display free word order (Rivano 1989; Arnold 1994), and non-configurationality (Baker 2003),[24] the explicit statement of more than one verbal argument is rare, as Mapudungun displays a tendency towards 'rampant pro-drop' (Baker 2003). Since all arguments of the verb are indexed within the verbal morphology itself, there is little need to make these arguments explicit by employing pronouns. In intransitive constructions, the verb can come either before or after a single argument, while in constructions with more than one argument the single explicitly stated NP tends to follow the verb (usually the SP, as it is less likely to be omitted, though it may also be the theme in a ditransitive construction, cf. 1.16c).

(1.16) Word order in the case of a single explicit verbal argument:

a. *l̪a-j ɲi tʃao* ∼ *ɲi tʃao l̪a-j* (intrans., Zúñiga 2006b: 240)
die-IND.3 my father
'my father died'

b. *mɨʈʂɨm-e-n-ew tʃi kalko* (transitive, Rivano 1989: 69)
call-INV-IND.1S-3SP the wizard
'The wizard called me'

c. *elu-e-n-ew kiɲe waka* (ditransitive, Golluscio 2010: 727)
give-INV-IND.1S-3SP one cow
'He gave me a cow'

[24] Rivano (1989) and Arnold (1994) give some proposals as to the basic word-order of Mapudungun, among which figure SVO, SOV and VOS. Baker (2003) on the other hand, bases his notion of non-configurationality on the language's relatively free word order and lack of agreement on the NP.

As Zúñiga (2006b: 242; 2010: 204) points out, the grammatical roles of subject and object are an oversimplification for the purposes of word order in Mapudungun, since these are not isomorphic with speech act participants. With this in mind, it is much more illuminating to say that the 'focal person' tends to precede the 'satellite person' (Zúñiga 2006b: 204). When a second argument is made explicit, the FP tends to come before the verb, and the SP, to follow it. Other orderings are possible, however, in which case the FP tends to be nearest to the verb (cf. Zúñiga 2006b: 240).

(1.17) Word order and participant hierarchy in Mapudungun transitive verbs (from Zúñiga 2006b: 240).

a. *Rayen* *mi̱ṯṣi̱m-fi* *Leftsaru*
R. call-3SP.DIR.IND.3 L.
'Rayén$_{\text{FP}}$ called Lautaro$_{\text{SP}}$'

(also: *Leftsaru Rayen mi̱ṯṣi̱mfi* or *mi̱ṯṣi̱mfi Rayen Leftsaru*)

b. *Leftsaru* *mi̱ṯṣi̱m-e-j-ew* *Rayén*
L. call.INV-IND.3-3SP R.
'Rayén$_{\text{SP}}$ called Lautaro$_{\text{FP}}$'

(also: *Rayen Leftsaru mi̱ṯṣi̱mejew* or *mi̱ṯṣi̱mejew Leftsaru Rayen*)

Chapter 2

Mapudungun Morphoprosody Today: *Previous accounts*

Elements of the prosodic structure of Mapudungun are dealt with briefly in most contemporary phonological accounts of the language. This said, there is little coherence in the evidence and ultimate analysis that different researchers provide. Such substantial divergence may be due to methodological and dialectal differences, as well as the theoretical assumptions of those collecting, analysing and presenting the data. The last of these points is argued particularly strongly by de Lacy (forthcoming) with regard to the evidence provided by Echeverría & Contreras (1965) for Mapudungun stress. His claim is that using data that was gathered with a particular theory in mind, may not meet the adequacy criteria to be used as evidence in a different theory.

Unfortunately, at this stage we have no way to corroborate the uniformity – regarding stress – of the varieties of the language used in the different contemporary studies. In most cases, we are not provided with many details as to the techniques for eliciting and evaluating the stress data, so it is difficult to judge its value. What we can do is learn from the puzzles presented to us by the studies and methods, with an eye to

improving on them.

The contemporary accounts we survey begin just over half a century ago, with the studies that first apply the phonemic principle to Mapudungun data.

2.1 Suárez, 1959

The first truly contemporary (phonemic) analysis of Mapudungun phonology is that of Argentinian Jorge Suárez. His article relies exclusively on the corpus gathered by Rudolf Lenz at the turn of the century (cf. Lenz 1895-1897). As a result, his assessment of prosody is unilluminating, given that 'accent is only exceptionally marked in the Pehuenche texts' (Suárez 1959: 178), these being the most abundant in Lenz's collection.[1] Ultimately, Suárez does little more than restating Lenz's (1895-1897: XXIV; 6; 388) observations on stress.

(2.1) Mapudungun Stress (Suárez 1959: 178)

a. it is not very strong;

b. it moves from one syllable to another depending on the rhythm of the utterance;

c. it moves from one syllable to another when particles are joined to the word;

d. words in general bear penultimate stress when ending in a vowel and ultimate stress when ending in a consonant.

Suárez goes on to speculate that stress might be assigned with reference to juncture or to the size of the utterance (as in the case of 2.1b) or with reference to morphological structure (with regards to 2.1c). In any case, he provides no conclusive analysis.

[1]Interestingly, the central Mapudungun texts, also called *Moluche*, in Lenz's *Estudios Araucanos*, are the most sparsely marked for stress in this work, while the Huilliche texts – the furthest outliers – have abundant marking. See §5.4.2.1 for more details.

2.2 Echeverría, 1964

Sergio Max Echeverría's study is perhaps the most methodologically transparent and rigorous one, although it may also be the most inconclusive. His team relied on an original data set of recordings from five informants native to the province of Cautín, near Temuco (see Figure 1.2). Though generally in line with Suárez's phonemic inventory, Echeverría questions the feasibility of 'word stress' in Mapudungun, especially if Lenz and Augusta's (and ultimately all the missionary grammars', see Chapter 5) assignment system is accurate (i.e. stress the last vowel before a consonant). To this effect, he provides an example from his data (p.46):[2]

(2.2) Unexpected stress in Mapudungun (Echeverría 1964: 48)

eymú	*epú*	*wijá*	*θuɲu-j-m-ú*
you-D	two	yesterday	speak-IND-2-D

'you two spoke yesterday'

In this case, all the (morphosyntactic) words in the utterance are stressed on the final syllable. Echeverría therefore explores the possibility of Mapudungun having 'phrasal stress', for which he conducts a brief perception experiment. His team was given 13 Mapuche utterances with all possible stress alternations to record and then play back to a native speaker (María Catrileo) who would then judge their acceptability in a randomised listening task (each variant was presented twice). The results show little consistency in the acceptability of stress positioning for phonotactically similar utterances:

[2]Glosses are my own.

(2.3) Acceptable and unacceptable stress patterns (Echeverría 1964: 64)

a. *inʈʂé ɲi fiʈá* (acceptable)
I POSS husband
'my husband'

b. *kɨmé ʈʂipantú* (not acceptable)
good year
'good year'

c. *θúŋu-lá-ja-j-í-ɲ* (acceptable)
speak-NEG-FUT-IND-1-P
'we will not speak'

d. *wúl kɨθaw-á-n* (not acceptable)
tomorrow work-FUT-IND.1.S
'I will work tomorrow'

As these results provide no further insight into stress assignment, Echeverría simply tells us that Mapudungun has 'a strong tendency towards alternation in stress, and many words change their stress according to their position' (47). Since he has given some evidence as to the fact that neither Suárez's simple word-level rules (2.1 above) nor utterance/phrasal ones (2.1) are immediately transparent, he suggests the possibility that stress may be conditioned by morphological factors. In other words, he suggests that stress could be sensitive to certain morpheme boundaries, or that certain morphemes could have fixed stress. Unfortunately he undertakes no further analysis to try to clarify this point.

The author also states that it is possible to distinguish two 'levels of phonemic stress' (48), one which is 'strong', receiving a mark, and the other which is 'weak', being left unmarked. In other words, Mapudungun has only stressed and unstressed syllables (i.e. no graded differences between stresses). He tells us also that there is no 'phonemic' stress in the sense of being contrastive, but that, as stress is not predictable by rule, it is likely to be linked to specific morphemes (i.e. lexical stress).

2.3 Echeverría & Contreras, 1965

Although a number of more recent grammars deal with Mapudungun stress in similar or greater detail than this paper (hereafter E&C), its easy access (published in the *International Journal of American Linguistics*) and its contentious evidence for right-headed quantity-insensitive feet, has made it the most widely cited work on the topic. It figures prominently in a number of surveys on stress and metrical structure (such as Hyman 1977: 41-2, Kager 1993: 409, 2007: 205-6, Hung 1993: 177-80, 1994, Kenstowicz 1994a: 556, Hayes 1995: 266, Gordon 2002: 522, 2011b: 143 Hyde 2002, McGarrity 2003: 59-61, Tesar 2004: 220-21, Hermans 2011: 982-984) which is precisely why it makes a good case study for de Lacy's (forthcoming) critique of limited stress evidence when making larger theoretical claims.

Even though this article appears to be based on the same data-set as Echeverría's (1964) study,[3] the later paper's conclusions on stress assignment are diametrically opposed to what we find in the earlier one. In this case we are told that stress is predictable, specifically with reference to the phonological word. The general rule the authors give is stated in 2.4, with their examples in 2.6.

(2.4) 'a phonological word [which has anything from one to six syllables] has main stress on the second syllable and, if applicable, secondary stresses on the fourth and sixth syllables' (134).

[3]E&C is a very brief outline of the language's phonology and does not give abundant detail as to the methodologies used. It does say, however, that data is 'based on material elicited (and recorded) from five informants, all of them from the Cautín province in Chile' (E&C:132), which, along with Salas' statement that the two accounts are 'substantively identical'(1980: 32), Rivano's conviction that E&C is 'a compact, English version of Echeverría (1964)'(1989: 135), and Lagos' claim that they are 'the same description' (1981: 43), lead us to believe that they are, in fact, based on the same data. In personal communication with Helles Contreras, the second author, we were told that the original recordings for the paper were lost. Sadly, Sergio Echeverría, who may have known more of the whereabouts of these data, passed away in 2010.

(2.5) Stress examples in E&C (134)[4]

a. *wu.lé*
tomorrow
'tomorrow'

b. *ʦi.pán.to*
year
'year'

c. *e.lú.-mu.-j-ù*
give-INV.2-IND.1-D
'give us'

d. *e.lú.-a.-è.-n-ew*
give-FUT-INV-1-3SP
'he will give me'

e. *ki.m-ú.fa.lù.-wu.-là-j*
know-SIM-REFLEX-NEG-IND.3S
'he pretended not to know'

At this point, it seems that E&C's stress assignment system is fundamentally syllable-counting and weight-insensitive. However, the system becomes more complex with the addition of four 'special rules' (p. 134):

(2.6) 'Special rules' for stress assignment (E&C)

a. Three-syllable words ending in a consonant have a secondary stress on the last syllable: [θu.ŋú.-là-n] speak-NEG-IND.1.S'I do not speak'.

b. Two-syllable words ending in a vowel may be stressed on either syllable, except particles (adverbs, pronouns, prepositions) which are always oxytone: [rú.ka] ∼[ru.ká] 'house'; but [wu.já] 'yesterday', [wu.lé] 'tomorrow', [in.tʃé] 'I', [ej.mí] 'you', [few.lá] 'now', etc.

[4]Syllabification and glosses are our own.

c. One-syllable words are stressed if an unstressed syllable follows, and vice versa: [pu rú.ka] 'in the house' vs. [pú me.tá.we] 'in the jar'.

d. If the suffix [-la] negative occupies the fifth syllable, the secondary stress is shifted from the fourth to the fifth syllable, and the sixth (if any) loses its secondary stress:

(2.7) Special stress in longer words with *-la* '-NEG'

la.ŋ-ɨ́.m-ɨ.-wu.-là-j
kill-CAUSE-REFLEX-NEG-IND.1.S
'he did not kill himself'

If we overlook the paucity and theory-specific nature of the data (already examined in detail by de Lacy forthcoming), it is still difficult to formalise E&C's findings in a contemporary, generative theory of stress assignment. Clearly, the iterative nature of the stress pattern lends itself to a foot-based analysis. The general rule seems to describe a quantity-insensitive (even) iamb. However, in terms of Hayes's very influential 1995 foot inventory, the only quantity-insensitive foot is the syllabic trochee, its iambic mirror-image being explicitly ruled out. As de Lacy (forthcoming: §3.4) points out, Hayes (1995: 266-8) relies on the lack of phonological analysis in the 1965 paper to claim that Mapudungun simply does not follow the weight-by-position rule, and, having no weight contrast, it simply builds 'defective iambs' (i.e. right-headed feet with two light syllables) throughout.

For the cases where E&C provide an unexpected stress on the final CVC syllable (as in 2.6 *θu.ŋu.lán* and 2.7 *la.ŋɨ.mɨ.wu.láj*), Hayes assumes there is a 'perceptual effect' and dismisses the form for lack of adequate 'phonological diagnostics for supporting their transcriptions' (Hayes 1995: 266). Although the argument is tenuous, Hayes supports it by noting that, at least in one case provided in E&C's paper (p.134), vowel

reduction seems to be attested in what would be expected to be the weak branch of an iamb, thus maximising their contrast in accordance to the iambic/trochaic law.

(2.8) Vowel reduction in the weak branch of an iamb (Hayes 1995: 268):
/kɨ.θáw/ → [kə.θáw; kθáw] 'work'

Hayes does not deal with the issue of disyllabic nouns where the stress position alternates, nevertheless, this can be accounted for by saying that stress-initial words have lexical stress, which contrasts with the second-syllable stress assignment algorithm. The analysis – though he does not specify this – must also rely on the negative suffix /-la/ having lexical stress, which in clash situations produces destressing of adjacent secondary stress, but not of primary stress, as in the contrast between the examples in 2.9:

(2.9) Proposed lexical stress on negative morpheme *-la*, to fit the analysis in Hayes (1995)

	(	x			)		(	x			)				
a.	(	x)	(	x)		→	(	x)		⊗	(x)				
	la.	ŋ-ɨ́.	m-ɨ.	wù-.	laj		la.	ŋɨ́.	mɨ.	wu.	làj				
	(	x	)		(	x	)								
b.	(	x)		→	(	x)	(x)								
	θu.	ŋú.	lan		θu.	ŋú.	làn								

Words with the suffix /-la/ are not, however, the only possible candidates for E&C's first 'special' rule (2.6). If we take *a.li.wen* 'tree', as given by Echeverría (1964: 35),[5] we should expect to find main stress on the second syllable, as well as secondary stress on the final, closed syllable. If the language truly does not follow weight-by-position,

[5]The 1964 paper gives stress as word final: *aliwén*.

then the 'defective iamb' analysis is unable to deal with these words: Furthermore, the lack of clash resolution in such cases prove somewhat difficult for an account such as Hayes's (1995).

(2.10) Unexplained patterns in the 'no-weight by position' iambic account:

(x)

(x) ?

a. lí. wèn

Be this as it may, without further evidence, the entire analysis can also be applied to 'even' iambs, as has been taken to be the case by Gordon (2002: 522, 545), as well as Kager (2007: 205-6) and Hyde (2011: 1055). Even more importantly, E&C's avoidance of a number of the forms in Echeverría's paper,[6] creates the illusion of a very straightforward, iterative system, which has created important theoretical ripples in the broader field of foot-inventories and typology. For instance, words which were judged acceptable in Echeverría's paper, such as [θú.ŋu.lá.ja.jíɲ] (cf.2.3c), violate E&C's general rule (2.4), while words like [θú.ŋuj.mú] (cf. 2.2) violate the first 'special rule' (2.6), as well as the general rule.

E&C's paper also takes a leap from the simple binary contrast between stressed and unstressed syllables (in Echeverría 1964) to claiming two levels of stress, which Echeverría implies is unwarranted (1964: 48). Furthermore, placing stress at the left edge of the prosodic word (in the 1965 paper) contradicts all previous accounts, where main stress is at the right edge.

Ultimately, the generalisations that are proposed in the article are puzzling, especially given the scarcity of data provided to exemplify and ground them. In particular,

[6] Although the data for the two studies seems to be the same, the articles may represent different stages in the analysis (or even collection) of the data. In the kindest of lights, we could suppose that E&C's article was submitted before some of the contentious forms were encountered.

the criteria used for distinguishing primary and secondary stress are not given, as is also the case for the establishment of prosodic word boundaries.

2.4 Smeets, 2008 [1989]

Ineke Smeets's grammar is the published version of her 1989 doctoral dissertation, which was the first full-fledged grammar of Mapudungun since Augusta's, in 1903.[7] Her data come from one main informant whom she worked with in the Netherlands, and four additional ones whom she worked with in Chile. Although the grammar's main focus is morpho-syntactic, Smeets does spend some time on the phonology and morpho-phonology of the language, including a full – albeit brief – chapter on stress (Chap. 7). Based on her bibliography it is evident that she had access to Suárez's (1959) paper as well as E&C's. She does not seem, however, to have had access to Echeverría's (1964) article. This is important, as her analysis is ultimately closer to the 1965 paper than to the 1964 one.

Her basic claims are as follows (Smeets 2008: 49):

(2.11) Stress tends to fall on the vowel before the last consonant of the word:

a. *rú.ka*
house
'house'

b. *ru.ká-mu*
house-POST
'in the house'

c. *le.f-íj*
run-IND.3.S
'he ran'

[7]We do not count Ernesto de Moesebach's 1962 *Idioma Mapuche*, since it is mostly a re-writing of Augusta's grammar.

(2.12) Trisyllabic words tend to have the second vowel stressed (even when there is a word-final consonant). The only exception is *atʃawáʌ́* 'chicken' (apparently a Quechua borrowing).

a. *ku.ɲí.faʌ́*
orphan
'orphan/poor person'

b. *tʃɨŋ.kɨ́θ.-j-i-ɲ*
roll-IND-1-P
'we rolled'

(2.13) Longer words may have several stressed syllables. In general, every second and every last vowel is stressed[8], with the second vowel having primary stress in most cases, as in:

a. *af.má.-tu.-là-n*
admirable-VB-NEG-IND.1.S
'I did not admire'

b. *nak-ɨ́m-fi-y-u*
down-CAUSE-3DIR-IND.1-D
'we brought him down'

c. *aʌ́.kɨ́.-pe.-nu.-èl*
hear-PX-NEG-PARTIC
'unheard of'

d. *ke.ʌ́ú.-pu.-tù.-ke.-fù-n*
help-TRLOC-REST-HABIT-BI-1.S
'I usually went back there to help'

[8]Whether example (b) constitutes an exception to this general rule or a typographic mistake is unclear, as the issue is not addressed in Smeets's account. We may ask, also, whether in example (a) in 2.14 lack of final stress is related to the fact that stress is primary, rather than secondary.

(2.14) In longer forms two main stresses may be heard.

a. *a.nɨ́-ɲ.ma-ɲ.mà.-ki.-é.-l-i* *ɲi* *makuɲ*
sit-TRANS-APPL-NEG-2S.INV-SUBJ-1.S POSS poncho
'don't you sit on my poncho!'

b. *kɨθáw-el-mè-we-là-fi-j-í-ɲ*
work-PROG-AND-PSIST-NEG-3.DIR-IND-1-P
'we did not work there for him anymore'

Smeets's assessment seems to be a hybrid one, taking some elements from the traditional view of the missionary grammars (along with Lenz/Suárez) and some from E&C's 1965 article. The general gist is that in most disyllabic words main stress falls on the last vowel before a consonant, but that in longer words, it is on the second syllable, with secondary stress being assigned to the final syllable. A number of disyllables do, however, have 'unpredictable' (i.e. lexical) stress on a final vowel not followed by a consonant. There are also, in her analysis, a number of suffixes with fixed stress, while others are unstressed throughout.

As in E&C's account, no details are given as to how levels of stress are determined. More problematically, main stress seems to be calculated at times from the right edge and at times from the left. In most of the examples a left-to-right iterative pattern is argued for, similar to E&C's (cf. 2.6). Smeets goes on, however, to claim that 'five-syllable words tend to have the penultimate vowel stressed', as in 2.15.

(2.15) Stress in pentasyllables (Smeets 2008: 50 – glosses added)

a. *i.lò.-ku.ʎíɲ.-fe*
meat-animal-AGENT
'butcher'

b. *ràm.tu.-pe.-á-j.-m-ɨn*
question-PX-FUT-IND-2-P
'you$_P$ may ask'

Here we get main stress at the right edge, as well as sequences of more than two unstressed syllables medially (2.15), which cannot be explained by quantity insensitive feet such as those which could be used, for instance, in (2.14). Even if we disregard the inconsistencies in the relative positioning of primary and secondary stress, we must recognise that a simple phonological rule (or set of constraints) at the morphosyntactic word level simply will not do in order to explain stress assignment in this data.

A closer look at the internal structure of Smeets's examples suggest complex words of more than two syllables are stressed finally on all nominal roots and verbal stems, a phenomenon first observed by Augusta (1903:3-4; see also Moesbach 1962: 33). Note that although Smeets gives *kuɲífaʎ* 'orphan, poor person' (2.12) as undecomposable, it can also be analysed as an adjectival construction *kuɲi* 'to care' (cf. Aug: 99) followed by the adjectival suffix *-faʎ* (Augusta 1903: 278), to mean 'worthy of care', which falls in with the root-final stress analysis. Also, in the case of *nakɨmfijù* 'we brought him down' (2.13), a causative suffix, *-ɨm*, is added to the root *nauɥ-* 'descend'. The result seems to be that stress is assigned to the root *kuɲi-* in the complex adjective, but to the stem *nauɥ-ɨm*, which includes the causative (see §3.4.3.1 and §4.3.2 for the analysis of this phenomenon in the new fieldwork data)[9]

(2.16) Stem (S) and root (R) stress in polymorphemes (based on Smeets 2008).

a. [[[kuɲí]$_R$]$_S$[faʎ]]

b. [[[nak]$_R$ɨ́m]$_S$fijù]
down-CAUSE-3SP.DIR-IND.1-D
'we brought him down'

The general rule stressing the last vowel before a consonant seems to be generally applicable throughout, except where it would become immediately adjacent to

[9]The closeness of the bond between the root and the stem-level causative suffix (*-ɨm*) is made evident by the root allomorphy we find in suffixed (*nak-*) vs. bare (*nauɥ-*) forms. See 3.26 for further details.

root/stem stress (cf. 2.12; 2.12; 2.13) or where the final vowel is [ɨ∼ə] separating heteromorphemic consonants (cf. 2.15).[10]

Smeets provides us with some interesting insights in showing that many words switch their stress pattern when followed by '*mu*', a postpositional element which can be analysed as part of the stress assignment domain (most likely the prosodic word) in order to explain alternations such as that between (2.11a) and (2.11b). In a way, though she fails to look closely enough at the internal structure of words, Smeets does look beyond the morphosyntactic word to find clues to stress assignment.

All in all, Smeets supplies a richer data set than previous studies. However, such heterogeneity of examples with no apparent system leads her to try to draw from too many of the previous analyses, ultimately bringing about clumsy generalisations. A huge advantage of the recent re-edition of her thesis, however, is the collection of recordings that give us examples of fairly naturalistic uses of Mapudungun stress, alongside careful morphosyntactic transcriptions.

2.5 Salas, 2006 [1992]

Adalberto Salas's grammar is a posthumous re-edition of his out-of-print 1992 grammar. A Capuchin Friar himself, Salas follows the missionary grammars closely in their account of stress, adding some interesting insights from his extensive experience with the language and his relatively up-to-date linguistic knowledge. Firstly, he tells us that 'stress can change position within certain domains of the word' (73). Though these 'domains' are not specified in his grammar, the idea that the internal structure of words must be looked at is certainly suggestive.

He restates the idea that stress often falls on the last vowel before a consonant, but

[10] In this case, the schwa is most likely epenthetic, only added after stress is assigned to the full vowels.

in a much more restrictive way: 'In slow, deliberate speech, two-syllable words ending in a vowel can be pronounced either grave or acute (*ɻú.ka* or *ɻu.ká*), and those ending in consonants tend to be acute' (73). Note that the variation seems to be permitted only in rather artificial conditions and that in running speech the possibility of variation is much more restricted. Unfortunately, Salas does not clarify what the tendency is for speech that is not 'slow' and 'deliberate'.

According to Salas, trisyllables ending in a vowel are stressed on the penult, while those ending in a consonant tend to place main stress on the ultima, with secondary stress on the antepenult (first) as in *à.tʃa.wáʌ́* 'chicken' (74) or *wà.ŋi.lén* 'star' (Salas 1978a: 153). In the case of four-syllable words, the same rule applies for main stress. Secondary stress alternates between the first and second syllable if the latter ends in a vowel; if it ends in a consonant, the second syllable receives secondary stress.

(2.17) Stress on four-syllable words (Salas, 2006:74 – detailed glosses added)

a. *kà.ma.pu.-lé-j* ∼ *ka.mà.pu.-lé-j*
far-PROG-IND.3
'it is far'

b. *we.jùl.-kɨlé-j*
swim-PROG-IND.3
'(s)he's swimming'

In general, according to Salas, there is secondary stress on the first or second syllable of longer words, with stress on the second syllable if it is closed.

(2.18) Stress on longer words (Salas 2006:74 – detailed glosses added):

a. *pɨn̪àn̪-tuku-le-l-ŋe-ke-ɻké-j*
stick-put.in-PROG-APPLIC-PASS-HAB-REP-IND.3
'they say that this is stuck back on him'

b. *wàsu-tuku-jaw-keɪ̯-kéj* ∼ *wasù-tu-ku-jaw-keɪ̯-kéj*
huaso-wear-CIRC-HAB-REP-IND.3
'they say he goes around dressed as a huaso (Chilean cowboy)'

Also, Salas claims a strong tendency for stress on the morpheme *-fi*, which marks a 3rd person SP in direct constructions. Hence the pattern in (2.19a) is much more common than that in (2.19b) or (2.19c).

(2.19) Stress and the *-fi* morpheme (Salas, 2006:74 – detailed gloss added)

a. *lèli-fí-m-i*
look-3DIR-IND.2-S
'you looked at him'

b. *lèli-fi-m-í*

c. *lelì-fimí*

Although Salas's analysis is much more consistent regarding the edges where main and secondary stress are assigned, these two appear to be completely separate phenomena, which seems, from a processing standpoint, extremely cumbersome. The native speaker would be required to count syllables (or moras) in both directions. Again, keeping roots and stems in mind might help us resolve these difficulties, as the same rule that applies to the right edge might also be applicable to the root-domain. As a matter of fact, although in his grammar (Salas 2006) he only makes reference to the left edge for the second stress in longer words, in his earliest work (Salas 1976: 153), the domain for secondary stress is, precisely, the root. Furthermore, in his data for verbs in the grammar, the two-syllable window at the left edge is, overwhelmingly, coextensive with the root domain. We will return to this analysis (and attempt an explanation of exceptions to the pattern) once our own data has been presented (cf. §3.4.2.2).

2.6 Zúñiga, 2006

Much in line with Salas's grammar (Zúñiga was in charge of its re-edition), Fernando Zúñiga's book provides a very readable and linguistically savvy introduction to Ma-

pudungun, including a concise analysis of stress. The main points he makes are as follows:

(2.20) Stress in Mapudungun (Zúñiga 2006b)[11]

a. Stress is predictable from syllable structure.

b. The language distinguishes open and closed syllables.

c. Main stress falls on the last or penultimate syllable.

d. Closed syllables attract main stress.

e. In disyllables, main stress tends to fall on the final syllable if both syllables are open.

f. In polysyllabic words, it is the penultimate that attracts main stress if both syllables are open.

g. Long polysyllabic words have secondary stress, generally on the first or second syllable. Closed syllables attract this secondary stress.

h. The morpheme *-fi* tends to attract main stress in verbs.

Zúñiga's text follows Salas's (2006) analysis very closely. The only difference seems to be the observed tendency for disyllables with both syllables open to have final stress, while those with a closed-open pattern seem to attract intial stress (on the closed syllable).[12] As evidence for this state of affairs, Zúñiga provides many of the same words as Salas, but then includes a word list (not marked for stress), accompanied by audio recordings. Interestingly, the recordings are made in parallel by two speakers

[11] In a more succinct and technical encyclopedia entry, Zúñiga states that 'Primary stress can be largely predicted from syllable structure (it tends to fall on the penultimate mora) – with some exceptions, as in a number of disyllabic adverbs whose stress is lexically assigned to the ultima' (2006: 487).

[12] Recall that Salas gives both final and penultimate stress as options in the case of both syllables being open.

(one male, one female[13]) whose rendition of the words – specifically in the case of disyllables – appears to be contradictory in terms of stress (i.e. the two speakers stress opposite syllables), in particular for the cases of *ri.mɨ* 'autumn', *fal.ke* 'shoulders', *pon.ʈʂo* 'poncho' and *kof.ke* 'bread'. Crucially, although Zúñiga does admit his rules are a tendency – in particular for open-open series such as *ri.mɨ* – the very small sampling he himself gives seems to argue against stress attraction by an initial closed syllable in the closed-open pattern (as in *fal.ke*, *pon.ʈʂo* and *kof.ke*, all of which are given by the female speaker as stress-final).[14]

The recordings in Zúñiga's grammar also include a number of stories and poems, which are valuable in exemplifying stress assignment in somewhat-naturalistic speech (the stories were read, a medium that is rare for Mapudungun). As a matter of fact, a series of analyses focusing on the phonetic correlates of stress in Mapudungun were conducted by O'Keefe (2007) based on the first of the fictional stories (*epew*) from Zúñiga's collection (2006b: 268-281 *Feychi ngürü afngünengeku* 'The cunning fox').

O'Keefe's pilot-study attempts to find some kind of verification of the claims in the typological literature which claim (based on E&C) that Mapudungun is a quantitity insensitive iamb parsed left to right. His results (O'Keefe 2007: 6-12) show the only major phonetic distinction between the first and second syllables of CV.CV words to be duration. While intensity and pitch were not significantly different (intensity: n=13, paired t-test: $p<0.198$; F0: n=13, paired t-test: $p<0.064$), the final vowel had a longer duration (V1 mean=76ms, V2 mean=97ms; n=13, paired t-test: $p<0.001$). Furthermore, for longer words, he was unable to find a duration correlation between even-numbered syllables as opposed to odd-numbered ones (n=28, paired t-

[13]The recordings are credited to Clara Antinao and Leonel Lienlaf (cf. Zúñiga 2006b: 11).

[14]Although we are well aware that the percepts of non-native patterns is full of pitfalls for analysts, these patterns seem relatively unambiguous, especially in the light of the findings in §3.2.1.3.

test: p<0.595) as in (2.21a).[15] He also tested the possibility that the pattern was that of a quantity sensitive iamb, but failed to find a correlation between the durations of stressed CV syllables (i.e. an even-numbered syllable with no coda, such as [tʃi]) in 2.21a) and open syllables following CVC syllables at intervals of two syllables (n=10, paired t-test: p<0.188), as in cases like (2.21b).[16]

(2.21) O'Keefe (2007) results for duration in longer words (glosses added):

a. No duration correlation among underlined or non-underlined syllables:

pi.tʃí.-le.-we.-tʃi
small-PROG-PSIST-THAT
'small remainders'

b. No correlation of underlined syllables to purportedly stressed CV syllables, such as the second syllable ([tʃi]) in 2.21)

kin.tu.-ti.ku.-me.-lu
look-put.in-AND-PART
'while looking inside'

O'Keefe takes his results to show that the fundamental cue for stress in the language is vowel duration, and that, based on the lack of correspondence between duration of the relevant syllables, Mapudungun cannot be considered either a quantity sensitive or insensitive iambic, left-to-right system. This would be shown by the non-correspondence of stress (i.e. duration) in the heads of feet as opposed to their weak branches as in the parsings in 2.22.

[15] In this case he examined only CV syllables, since closed syllables were presumed to be naturally longer.

[16] Note, again that the comparison is between CV syllables rather than trying to compare them to CVC ones, which are presumed longer.

(2.22) Expected iambic parsing (O'Keefe 2007)

a. pi. tʃi. le. we. tʃi	b. kin. tu. tɨ. ku. me. lu	
(. x)(. x)	(. x)(. x)(. x)	even iamb
(. x)(. x)	(x)(. x) (. x)	quantity-sensitive

Although there is a valid question in whether a median difference of 21ms in vowel length is enough to be perceptually significant for marking stress (cf. de Lacy forthcoming: §3.5), a more important problem with O'Keefe's study has to do with the assumption that CV.CV disyllables are consistently stress-final. Such a claim is at odds with virtually all other work on stress in the language, including Zúñiga's 2007 grammar (from whence the data is originally taken), and even Echeverría and Contreras' (1965) article which explicitly states that 'Two-syllable words ending in a vowel may be stressed on either vowel' (134).

A number of the CV.CV words in the sample data are pronouns and adverbials, which have been claimed both in contemporary and historical grammars to be specified for final stress, which is likely to tip the scales towards final stress; however, no default pattern can be assumed on this basis. Furthermore, the most common CV.CV word provided is the numeral *kiŋe* 'one' (O'Keefe 2007: 6), which in contemporary Mapudungun is used fundamentally as a definite article (cf. Zúñiga 2006b: 93). The lack of significant difference in pitch or intensity may well be the result of including such function words in the analysis (cf. Selkirk 2003; Kager 2007). Another possibility is also that the longer durations of second syllables is simply a broader final-lengthening process.

In addition, a number of the longer words used in the sample are highly complex and may be analysed – at least morphosyntactically – as separate lexical items. In other words, it is difficult to know whether the domains chosen for the contrast or correspondence between phonetic features is accurate. Finally, the nature of the data

is also relatively suspect insofar as the recordings in Zúñiga are read, thus bringing in rather artificial registers and processing strategies, especially since we are dealing with an almost exclusively oral language. This is coupled with the fact that the words were taken from a longer text and no attention was paid to possible phrasal phenomena influencing the realisation of stress in individual words. In sum, although his methodologies are interesting, O'Keefe's approach to the data would benefit from some more detailed overall knowledge of the language, a clearer view as to the speaker intuitions that are being matched to acoustic features, and a body of data better suited to the goals at hand.

Returning to Zúñiga's own claims, one of the most interesting and original of these has to do with a number of pragmatic phenomena regarding stress. He claims that, depending on the syntactic and semantic content of the word, stress may alternate position between the final and penultimate syllable. For example, he claims that in cases such as 2.23, the semantic difference between 'this coming winter' (a) and 'last winter' (b) has an influence on stress assignment.

(2.23) Stress alternation and pragmatic effects (Zúñiga 2006b: 64-5):

a. *fatʃí pukém kɨθaw-me-a-n ɻafkeɳ pɨle.*
This winter work-AND-FUT-IND.1.S sea near.
'this (coming) winter I will go work by the sea.'

b. *fatʃi púkem miaw-me-n Santiago waria mew.*
This winter walk-AND-IND.1.S Santiago city PREP
'this (last) winter I went to walk in the city of Santiago'

A closer look at the recordings of these sentences shows that, if there is a rule of this nature, only one of the speakers (the male subject) seems to apply it. Although focus marking may appear to change the stress position, it is crucial to note that the temporal semantics are clear from the verbal morphology (null marking for the non-future and

the suffix -*a* for the future), so if there is some level of semantic contrast between the two stress patterns, it is fully redundant. Furthermore, a look at the entirety of the sentence shows us that the speakers differ not only in the stressing of *pukem* (in b), but also in that of the following verb (*miawmen*). The female subject appears to place main stress on the root (*miáw-*), while the male speaker stresses the andative suffix (*-mé*) which is also part of the final closed syllable. Main stress for the male subject appears at the word level, while for the female, it is at the root-level. Although more data is needed, penultimate stress on *pukem* (in the case of the female speaker) might be associated with greater prominence on the first syllable of the following verb in constituting some kind of rhythm rule.

Another one of Zúñiga's claims is that the position of main stress in 'some words' can vary between questions or statements, as in the case of *chadi* 'salt' in the examples in (2.24).

(2.24) Stress variation according to sentence type (Zúñiga 2006b: 64-5):

a. *ŋe-la-j* *tʃaθí* *tatʃi* *ruka* *mew?*
be-NEG-IND.3.SG salt this house in
'Is there no salt in this house?'

b. *ŋiʎa-me-a-n* *tʃáθi* *fewla.*
Get-GO-FUT-IND.1.SG salt now.
'I'll go and buy some salt now.'

Again, only the male speaker does this, assigning penultimate stress to *tʃadi* 'salt' in (b), while it is assigned final stress elsewhere. Crucially, the following word, *fewla* 'now', also varies its stress, which is final in the case of the female speaker and penultimate in the case of the male. It seems that here the case is also one of accommodation to initial stress in *fewla* which ultimately preserves alternating stress at the phrasal level.

Overall, Zúñiga's grammar is extremely useful regarding stress assignment, providing not only a preliminary analysis, but also a number of recordings for further exploration. The analysis is, however, oriented towards the non-specialist. Crucially, in more decidedly specialist works (Zúñiga 2000, 2006a, 2007b) the analysis of main stress is less detailed but ventures a stronger theoretical claim: stress falls on the penultimate mora. This is fundamentally equivalent to the claims above, but the moraic analysis opens up the Mapudungun data to a greater body of literature, which is not addressed in these studies.

2.7 Summary of contemporary accounts

We have examined the major contemporary accounts of Mapudungun stress and found that, in most cases, main stress is considered to belong to a window of two syllables at the right edge of the word (except for longer words in E&C, and Smeets 2008). However, most researchers also claim that there is a two-syllable window at the left edge for the assignment of secondary stress (for E&C and Smeets this is the window for main stress). Throughout, the tendency is for closed syllables to attract stress. The crucial problem with all of these analyses is that there is no articulation of the left- and right-edge stress assignment systems (except, of course, in E&C, where the system is iterative).

Suggestions are provided in several of the accounts regarding the possibility that the internal structure of words might shed some light on the overarching stress assignment system. In particular we noted that both nominal and verbal roots are overwhelmingly mono- and disyllabic, making them largely coextensive with the domain of secondary stress assignment described in the literature.

Also, there are a number of proposals regarding the influence of phrasal phenomena

on the assignment of word-stress. None of these is fully developed, but a closer look at the influence of particles (such as *-mu*, cf. Smeets 2008: 49) and phrasal boundaries (cf Zúñiga 2006b: 64-5) is warranted.

Although providing theory-neutral data is undoubtedly an idealisation (cf. de Lacy forthcoming: §4), much can be done to bring greater rigour to the data for Mapudungun, providing finer grained detail and a broader spectrum of methodologies. Ultimately, our goal will be to make the data useful to a wider array of theories and give sufficiently detailed survey of facts to overcome further contradictions in the literature.

Chapter 3

Mapudungun Morphoprosody Today: *New data*

In Chapter 2, the lack of consensus regarding the distribution of stress in contemporary Mapudungun was made evident. As a result, any new detailed study of stress and prosodic phenomena in the language ought to engage with the data using a variety of methods and analytical tools. The possible effects of word class, morphological structure, and morphosyntactic positioning should also be addressed. We begin, then, by asking what means are at our disposal for assessing the position of stress in a language where agreement on the matter is anything but clear.

The first crucial step to be undertaken is the gathering and recording of dialectally homogenous language material which gives a broad sampling of where the possible stress patterns are attested (§3.1). Seeing as how parameters and percepts for the actual acoustic realisations of stress vary from language to language, and because it is well attested that adult speakers are often unable to perceive crucial contrasts in the sound patterns of a language not their own (Werker & Tees 1984; Dupoux et al. 1997; Peperkamp & Dupoux 2002; Dupoux et al. 2008), we cannot simply impose our own

percepts of stress on this data. The natural answer to this view is to use the judgements of native speakers (§3.2.1.1). For Mapudungun, as we shall see, this presents additional complications, as speakers are almost universally bilingual in Spanish. The competition between the two prosodic grammars in one speaker means that there may be some overlap in the percepts of the position of stress (cf. de Lacy forthcoming: §3.2). In order to determine the validity of the native speaker judgements, we report on some experimental results that compare native speaker percepts with those of non-native speakers. Most importantly, but not exclusively, we focus on Spanish listeners, in an effort to establish the level of independence and robustness of the Mapududngun-specific stress perception and assignment system (§3.2.1.3).

Other possible sources for establishing the position of stress include the analysis of more widespread phonological patterns such as vowel reduction, metrical alignment in word-art, or evaluation of asymmetries in the diachronic development of stressed and unstressed syllables. For Mapudungun, however, there is little agreement as to whether the only candidate for vowel reduction, [ɨ] ∼ [ə], is truly based on lack of stress (see §1.2.1.1). Furthermore, poetry and song in Mapudungun tend not to be metrical in any clear way (cf. Caniguan & Villarroel 2011: 38-42), a fact noted as far back as Augusta: 'not a single law of versification is plain: there is no symmetry in the number of syllables that make up a verse, nor is there a well pronounced and uniform rhythm' (1910: 269).[1] Finally, we have so far been unable to find any clear (segmental) diachronic processes that could target only stressed or only unstressed syllables.

Our analysis therefore relies on fieldwork data and native speaker intuitions, which, when vetted through consistency of acoustics and independence from the Spanish stress system, appear to be reliable sources of knowledge as to the position of stress.

[1] '[N]o se manifiesta ley alguna de versificación: no hay simetría en el número de sílabas de que se compone el verso ni un rítmo bien pronunciado y uniforme' (translation our own). Lenz (1895-1897: 388) finds some evidence now for trochaic, now for iambic organization, though the data from song he draws from is somewhat suspect in the light of his general transcription for stress (cf. §5.4.2.1, 276).

3.1 Fieldwork, a general outline

The main body of data that will be presented in this chapter is the result of a series of interviews conducted in the Rucapangue and Rapahue Mapuche communities near the town of Cholchol, an area of Chile's Araucanía Region considered by Croese 1980 to belong to a central variety of Mapudungun labelled Dialect III (see Figure 1.2). The interviews took place on site in early 2012 and included seven subjects (four male, three female), all native speakers of Mapudungun, though fluent in Spanish as well (for background data, see Appendix A). All speakers learned Mapudungun in the home, and in most cases only began speaking Spanish upon beginning school sometime between the ages of 6 and 10. They all still used the language when relating to other members of the community who were of their approximate age or older. All but one were literate in Spanish. Only one speaker (our main informant) had some limited experience reading and writing in Mapudungun. All speakers were over the age of 55, the eldest being 83 years old. Data was elicited using five different techniques:

(3.1) Elicitation tasks:

- Task A: Picture naming
- Task B: Stress discrimination
- Task C: General knowledge questions
- Task D: Picture-based questions
- Task E: Translation of sentences

Task A provided a number of nouns in citation form, which were followed up by a request for the speaker's own judgement of stress position within the same words (Task B). The last three tasks (C-E) targeted nouns and verbs in specific morpho-syntactic contexts. After the four tasks were completed, a more general conversation

was undertaken, where speakers were asked to focus specifically on their own perception of the acceptability of different stress patterns.

In the first task (A), speakers were asked to give lexical items that described the images that were presented on specially prepared flash-cards.[2] Once they struck upon the target word, in Task B they were asked to discriminate the position of stress in their own articulation (see 3.2).

Direct questions (Tasks C and D) were posed in Mapudungun by the main informant, Sergio Catricura, according to the researcher's instructions. Speakers were requested to answer WH-questions in as full sentences as possible, using one of the given flash-card nouns as the answer noun (which they were already familiar with, see Appendix A). In Task D, subjects were given a Spanish sentence and were asked to provide a Mapudungun equivalent.

Recordings were conducted with a high-fidelity microphone connected to a digital recorder. Some background noise remained due to many of the interviews being conducted out of doors or in the midst of other household activities.

3.2 New data for monomorphemic nouns

We begin presenting the data for contemporary Mapudungun stress by looking at nouns, as they tend to be morphologically simple (aside from compounds which we deal with separately in §3.3). Such forms should give us some ideas as to how stress works on a strictly phonological level, without interacting with the morphology, and thus provide us with a baseline for comparison in complex words. The lack of internal morphological structure of these nouns, as well as their relative ease of elicitation in isolation has also made them ideal targets for closer examination both at the acoustic

[2]Images of culturally relevant objects, animals, people and places were printed on 10x10 cm cards (see Appendix A).

and perceptual level. We assume that the traits discovered for nouns – specifically the acoustic and perceptual ones – span the entire prosodic grammar.

3.2.1 Disyllabic nouns

The elusive nature of stress in disyllables has been observed by virtually all contemporary accounts of stress. These range from claiming complete unpredictability of stress position (Echeverría 1964), to the proposal of a default rule and several items with fixed stress (Smeets 2008), to restricting alternation to words with a final open syllable (Salas 2006). Our phonetic analyses and the entirety of the experimental work are based on the nouns in isolation, so we will begin by providing this data, in order to later review and integrate it with the data for the same nouns in context.

3.2.1.1 Native speaker intuitions

Since main stress is phonemic in Spanish (cf. ⟨secretaría⟩ [se.kɾe.ta.ˈɾia] 'secretariat' vs. ⟨secretaria⟩ [se.kɾe.ˈta.ɾja] 'secretary') – a language all interviewees were proficient in – they were generally aware of differences in stress, and quite informative as to its position in Mapudungun words. Following the picture-naming task (3.1, Task A), once a word was elicited, the speaker was asked if it was produced with initial or final stress, and whether it could be said with an alternate stress pattern (Task B). In this case, the interviewer (and sometimes the main informant as well) demonstrated the possible stress patterns:

(3.2) Sample stress discrimination task (B) for the noun *ruka* 'house': Q: *¿Usted dijo 'rúka' o 'ruká'?* (Did you say *rúka* or *ruká*?)

A: *'rúka'* (*rúka*)

Q: *¿y es posible decir ruká?* (and is it possible to say *ruká*?)

A: *También se dice 'ruká'.* (*ruká* is also used.)

Interviewees were able to decide between the options given, always accepting at least one of the versions. They did often disagree, however, with regards to disyllables ending in a vowel. In such words, individual informants routinely gave both initial and final stress as acceptable. The result is that we find at least some preliminary evidence for intra-speaker variation.

Interviewees' initial responses to each item are summarised in Table 3.1.[3] In addition, the audio recording of the first token was kept (associated to the intuition), for the purposes of further phonetic analysis (§3.2.1.2), as well as for later perceptual experimentation (§3.2.1.3).

Table 3.1: Native speaker perception of stress position

Structure	Examples	Left Stress	Right Stress	*N*
CV.CV	[θó.mo] ∼ [θo.mó] 'woman'	63%	37%	30
(C)VC.CV	[wíŋ.ka] ∼ [wiŋ.ká] 'foreigner'	60%	40%	20
CV.CVC	[kɨ.ɻ́if] 'wind'	0%	100%	25
(C)VC.CVC	[aj.wíɲ] 'shadow'	0%	100%	35

The pattern for native speaker intuitions is relatively clear in that all vowel-final forms show variation in stress position, while those ending in a consonant are remarkably consistent in stressing the final syllable. The alternation in stress position, then, shows not only intra-speaker, but also *inter-speaker* variation, going against the claim that differences in disyllable-stress are due to lexical specification (Smeets 2008: 49-50). Furthermore, all vowel-final disyllables show this variation, regardless of whether the initial syllable is open or closed, a fact which argues against the claim in Zúñiga (2006b: 64; cf. also Sadowsky et al. 2013: 94) that initial closed syllables attract stress when the second is open.

Notably, there was a strong tendency for speakers to give the stress-initial form when asked expressly for the 'correct' stress pattern of CV(C).CV words. This pat-

[3]For the purposes of this table, we have recorded only the first of the intuitions given by each speaker, regardless of whether they accepted the alternative pattern.

tern is, furthermore, the one which was usually given in their slowest, most careful articulations. In other words, we seem to have some initial evidence for speech rate, and pragmatic or register effects having some influence on the positioning of stress in alternating forms (cf. §4.5.2).

Another issue we mention here is that, although our sampling does include nouns ending in a consonant preceded by [ɨ] (e.g. *kɨrɨf* 'wind', *mawɨn* 'rain'), we did not include forms with a final open syllable and an interconsonantal [ɨ] in the penultimate (e.g. *pɨt̪sa* 'stomach', *kɨn̪a* 'hay'). Nouns in the first group, such as *mawɨn* 'rain' and *kɨrɨf* 'wind', appear to pattern quite robustly with all other consonant-final nouns, in being perceived as stress-final. For the second group, nouns such as *pɨt̪sa* 'stomach' and *kɨn̪a* 'hay' are invariably stress-final, which contrasts with the situation of other vowel-final disyllables which tend to alternate. The explanation here appears to be that while [ɨ] in the final syllable is part of the underlying representation, and can therefore be stressed, the [ɨ] in the penultimate is epenthetic. Further evidence for this is the fact that the second group can be pronounced as monosyllables (*pt̪sa*, *kn̪a*), while the first cannot (**mawn*, **kɨrf*). We will return to this issue, in particular in the final section of Chapter 5, where we deal with the diachronic development of the language (§5.5).

3.2.1.2 Acoustic analyses

The accoustic analyses that were performed for disyllables took into account both alternating and non-alternating forms, and attempted to match the perception of stress given by native speakers to well-known suprasegmental correlates of stress (pitch, duration and intensity). It is important to note that since stress is primarily a perceptual or mental instantiation of prominence rather than a uniform physical trait of syllables, there is no single tell-tale sign of its presence. The establishment of the correlates of

the position of stress must take into account the phenomenon's syntagmatic character, thus relating the cues of syllable prominence to the realisation of the same cues on syllables considered non-prominent. In the case of disyllables, of course, this meant contrasting the two syllables within the word, i.e. stressed vs. unstressed.

Table 3.2: Disyllables for phonetic analysis

CV.CV	[tʃa.ʎa]	[θo.mo]	[ku.ɻa]	[ma.pu]	[ɻu.ka]	[ʈʂe.wa]	
	'pot'	'woman'	'stone'	'land'	'house'	'dog'	
CVC.CV	[kof.ke]	[piw.ke]	[wen.ʈʂu]	[wiŋ.ka]			
	'bread'	'heart'	'man'	'foreigner'			
(C)V.CVC	[e.kuʎ]	[kɨ.ɻɨf]	[ma.wɨn]	[pu.ʈʂem]	[ɨ.ʈʂar]		
	'shawl'	'wind'	'rain'	'tobacco'	'seed'		
(C)VC.CVC	[aj.wiŋ]	[fiʎ.kuŋ]	[il.wen]	[laf.ken]	[man.sun]	[meʃ.ken]	[mɨʎ.pun]
	'shadow'	'lizard'	'dew'	'ocean'	'ox'	'chili'	'soot'

Recordings of the tokens given in the picture-naming task (Task A, §3.1) were marked and tagged by hand at the segmental and syllabic levels using Praat 5.3.24 (Boersma & Weenik 2012), thus defining the domain of syllables and their nuclei. With the baseline of speaker intuitions given above (matched token to token), acoustic correlates for the perceived position of stress were explored. In particular, measures of the perceived stressed and unstressed syllables were compared to each other across a set of 100 disyllables of varying syllabic structure (i.e. the four or five clearest recordings by different speakers of the types in Table 3.2). The crucial statistical method used for the comparison was a paired t-test, which takes into account two 'meaningfully paired' observations such that the 'observations naturally come in pairs' (Johnson 2008: 79), and where one of the two members of the pairs may be significantly different from the other with regards to the key parameter. In this case the parameters were nuclear pitch maxima, vowel intensity maxima, and syllable duration. The three values for each individual token were extracted by means of automated Praat scripts and analysed using the JMP statistical package (version 10.0, 2012).

F0 Maxima: We focus here on a comparison of the maximum pitch within each syllabic nucleus. Using average pitch for syllables proved not to be useful as final syllables often showed a steep drop in fundamental frequency, thus skewing the average. The measures for pitch maxima in vowels, in contrast, show the most robust results in our data: syllables perceived as stressed had higher F0 peaks than those perceived as unstressed. In fact, this is the case for all but one of the 100 disyllables. In paired t-tests, furthermore, a highly significant difference was found between the F0 maxima of syllables which differed in native speaker perception of stress, both overall (N=100; mean difference: 48.9Hz; p<.0001) and in each of the four possible arrangements of closed and open syllables (HH: p<.0001, N=32; HL: p<.0001, N=17; LH: p<.0004, N=23; LL: p<.0002, N=28).

Figure 3.1: Waveform and pitch track for [ku.rá] 'stone' perceived as finally stressed

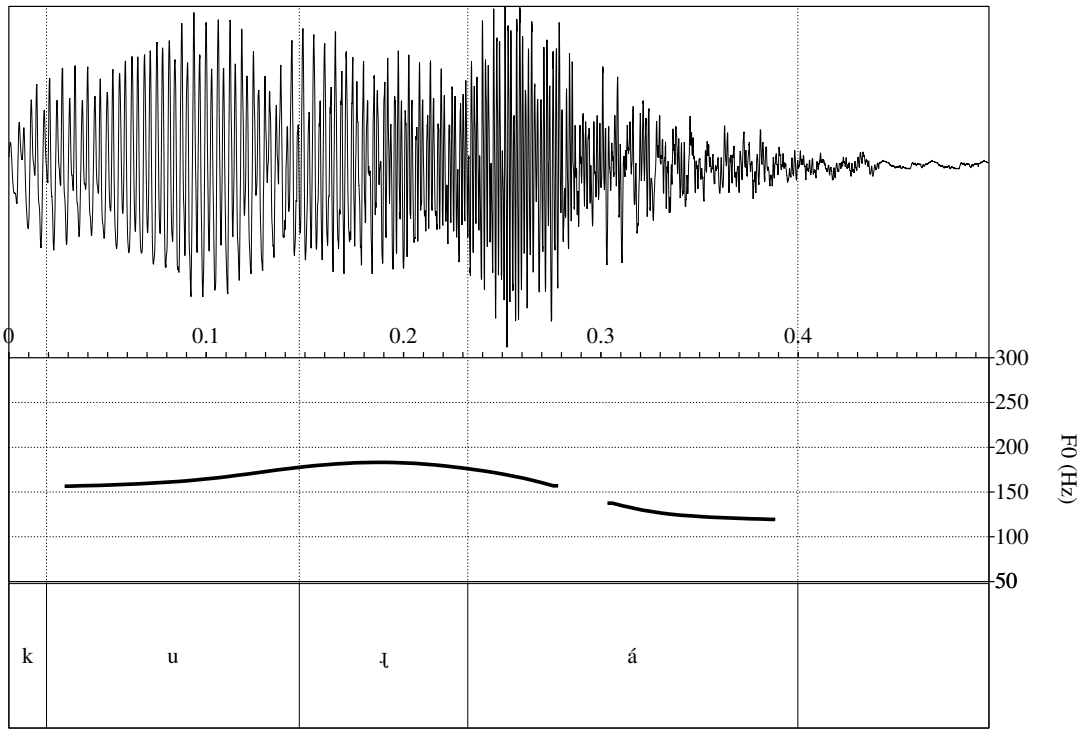
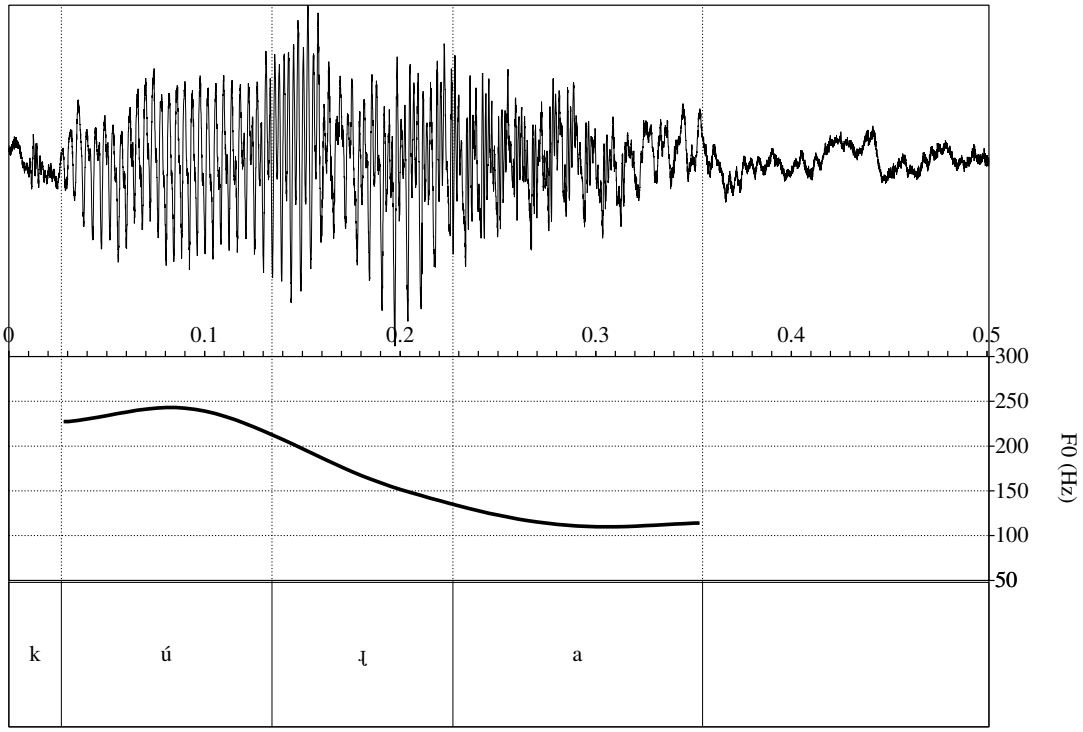


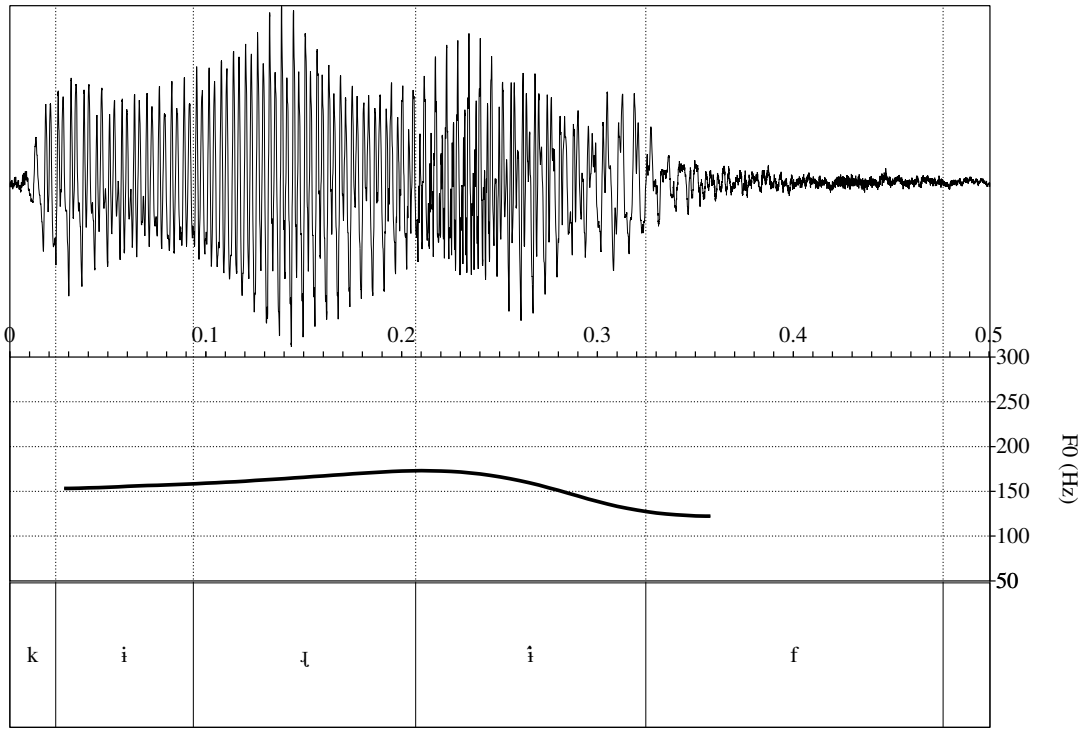
Figure 3.2: Waveform and pitch track for [kú.ra] ‘stone’ perceived as initially stressed



Overall, nucleus F0 maximum is the most reliable cue for stress position, even when variation is found among identical lexical items (cf. Figs 3.1 and 3.2). As noted in the section on native speaker perception, variation in the position of stress only occurs in words with a final light syllable, which is reflected in the position of the word’s pitch maxima. If the final syllable is closed, the pitch peak for the word is found within this syllable’s nucleus (cf. Fig. 3.3).

Duration: Contrary to the findings of O’Keefe (2007), this measure appears not to be significantly related to stress-position. Syllables considered stressed by native

Figure 3.3: Waveform and pitch tracks for [kɨ.ɻɨ́f] 'wind' perceived as finally stressed



speakers were longer in only 68% of cases, regardless of actual syllable structure.[4] In the cases where syllables were grouped in terms of structure (CVC.CVC and CV.CV words) the match with stressed syllables was no better: only 65% of CVC.CVCs had a longer final syllable (despite being universally perceived by by native speakers as stress final), while only 50% of CV.CV forms matched length to native speaker assessment of stress-position.

In a paired t-test, the difference between the length of syllables considered stressed and those considered unstressed was highly significant ($p<.0001$, mean difference: 64.7

[4]Unfortunately, we were only able to very loosely control for the types of consonants in the onset and coda of the relevant syllables. As per the language's own distribution, however, codas only contain non-obstruent consonants.

ms). However, a closer look at the weight of the syllables involved shows this is merely due to differences in syllable weight: stressed and unstressed syllables were significantly different in terms of duration only in invariantly heavy-final words (HH: $p<.0004$, N=32; LH: $p<.0001$, N=23), while light-final ones – in particular the series of two open syllables – showed no significant difference (HL: $p=.3819$, N=17; LL: $p=.9649$, N=28).

An issue to note here is that syllable duration may be related, not to stress, but to the syllable's position within the word. Final lengthening may be responsible for the lack of correspondence between length and stress. This possibility was explored by examining the correlation of length with syllable position. Overall, for the data set, the second syllable is an average 73.6 ms longer than the first. In a paired t-test, this difference was found to be highly significant overall ($p<.0001$, N=100). As would easily be predicted, this holds for all syllable-weight distributions except for HL ($p=.1979$, N=17), where the presence of a coda in the first syllable tends to make it longer, overriding the general tendency for a long final syllable. All other forms are significantly longer (HH: $p<.0004$, N=32; LH: $p<.0001$, N=23; LL: $p<.0001$, N=28).

Interestingly, these results reproduce those of O'Keefe's (2007) study of Mapudungun disyllables (cf. §2.6 above). Lacking native speaker intuitions for a correlate, O'Keefe argues that length in the second syllable may be a correlate of stress, therefore arguing for a quantity insensitive iamb, that is, a disyllabic, right-headed foot, where heads are signalled mostly by duration (cf. the iambic-trochaic law, Bell 1977; Hayes 1985). Having the native speaker intuitions for our own tokens makes this analysis an unlikely one, as a number of vowel final forms that O'Keefe assumes to be stressed on the ultima, are actually perceived as stressless in this position, despite the lengthening process. Nevertheless, the existence of O'Keefe's study gives us additional evidence for final lengthening as a feature of Mapudungun phonetic implementation.

Intensity: Results were more prominsing for intensity contours. In this case the focus was on the syllable nucleus, as measurements of the whole syllable may be confounded by inherent consonantal intensity. Again, and for the same reasons as for the pitch contours, we focus on peak rather than average intensity. Comparisons between nuclei found 80% of intensity-maxima to be in the syllable perceived by native speakers as stressed. Overall, the matched pairs t-test showed that the difference between the intensities of stressed and unstressed syllables was significant ($p<.0001$, N=99, average difference 3.1dB). Furthermore, individual groupings by syllable weight showed all syllable structures to have significantly different intensities across syllables (HH: $p<.0013$, N=32; LH: $p<.0001$, N=17; LL: $p<.0006$, N=28, but HL: $p<.0368$, N=16).

Overall: According to the original data presented here, the main cue to Mapudungun stress appears to be an increase in fundamental frequency, and perhaps to some extent, added intensity. These measures are operationalised here as the maximal nuclear F0 and amplitude peaks, which are found in syllables reported to be stressed.

3.2.1.3 Non-native speakers (an experimental approach)

Although we have already established a correlation between native speaker perception of stress and aspects of its phonetic realisation, it must be noted that the value of native intuition has occasionally been called into question as a source of phonological knowledge (e.g. Schütze 1996; Kawahara 2011). Furthermore, to the somewhat questionable reliability of these intuitions language internally, we add the fact that all Mapudungun speakers are bilingual in Spanish, a language where stress carries a greater functional load than in Mapudungun.

If native perception is the condition *sine-qua-non* for pinpointing the phonetic and structural properties of stress, what happens when native speaker intuitions become

suspect, due to universal, inherent bilingualism and language marginalization (as is the case of Mapudungun *vis-à-vis* Spanish)? In such a context, obtaining intuitions on stress appears to be an uncertain affair, chiefly because there is such a strong prototype for its cues, position, and importance put forth by the culturally dominant language.

With native intuitions suspect, and in the absence of other resources, we turn to the perceptions of non-native speakers. The data they can provide us with is of two sorts: the first relates to the general perceptibility of stress, regardless of native language. If there is consistency in the position of stress as identified by speakers of *different* native languages, there must be some reality to the percept. On the other hand, by comparing the perception of stress given by native speakers of different languages we can measure up languages according to their correlation with stress as perceived by native speakers of Mapudungun. Looking in particular at the accuracy of Spanish speakers as compared to speakers of other languages, we can speculate as to the degree of influence of the Spanish stress system on Mapudungun-Spanish bilinguals' own perception of stress. In other words, we attempt to disentangle the phonological modules governing each of the two languages in the bilingual speakers' grammar (de Lacy forthcoming: §3.2).

In the case of Mapudungun and Spanish, if the Mapudungun module is alive and well, perception of its stress is expected to be distinct for bilinguals, when compared to Spanish monolinguals. It is possible, however, that the pattern is equally identifiable to native speakers of Spanish, as well as speakers of other languages. In such a case the cues to the language's stress must be of a more general nature.

If a convergence is found between Spanish monolinguals and Mapudungun-Spanish bilinguals, we may assume there is some level of overlap in the bilinguals' phonological modules. If the results point to a convergence of all speakers' percepts, we may assume the prominences are, overall, easy to identify, and hence have a means of evaluating native speaker intuition. Finally, if there is one language – other than Spanish – which

converges with the native Mapudungun data, we may be in the presence of a very similar system of stress cuing, and hence find that Mapudungun stress assignment is both consistent and independent from Spanish in the bilingual speaker's perception.

(3.3) Goals for the non-native stress-perception task

1. Is the position of stress as perceived by native speakers of Mapudungun generally or consistently perceived in the same way by speakers of other languages?
2. Are Spanish speakers better than speakers of other languages at perceiving the position of stress in Mapudungun?

Experimental Design With the goals in 3.3 in mind, a forced-decision auditory task was designed, exploring the percept of stress in Mapudungun disyllables as assessed by native speakers of five different languages (Spanish, English, French, German, and Japanese). Subjects were played individual recorded disyllabic nouns from the Mapudungun interviews, and asked to click one of two buttons within 1.5 seconds in order to indicate where they perceived the main stress. The words had the structures (C)V.CV; (C)V.(C)VC; (C)VC.CV and (C)VC.(C)VC.

Fourteen participants – eight female, six male – were recruited for the task, with an average age of 28.5. Each language was represented by two participants, with the exception of Chilean Spanish, which was represented by six native speakers, since it is the closest contact language for Mapudungun and was being examined more closely as regards its influence on the stress of the target language.

The selection of languages was made in order to provide a relatively broad sampling of native stress/accentual patterns, and thus avoid biases in the perception of the Mapudungun patterns.

Table 3.3: Simplified stress/accent patterns reported for the listeners' native languages

Language	Stress/accent pattern	References
French	Phrase final accent (excluding schwa)	Dell (1984)
German	Rightmost heavy stressed	A summary in Jessen (2008)
Japanese	Lexical pitch accent	Haraguchi (1999)
English	Quantity sensitive, left-right stress with word-category-specific extrametricality	A summary in Trommelen & Zonneveld (2008)
Spanish	Penultimate mora in nouns, penultimate syllable in verbs / morphologically conditioned	Harris (1996); Roca (2005)

Subjects were required to judge the position of stress in 110 disyllabic noun tokens. These tokens, given in Table 3.4, were made up of 22 lexical items (types) presented five times each (5x22=110). The five individual tokens within each type corresponded to the recordings of different Mapudungun speakers interviewed in the fieldwork.[5] Importantly, even though each lexical item was repeated five times, the stress pattern of the words varied amongst the vowel-final forms.

Table 3.4: Target words for perception experiment

(C)VC.CVC	[aj.wiŋ] 'shadow'	[fiʎ.kuŋ] 'lizard'	[il.wen] 'dew'	[laf.ken] 'ocean'	[man.sun] 'ox'	[meʃ.ken] 'chili'	[miʎ.pun] 'soot'	7
CVC.CV	[kof.ke] 'bread'	[piw.ke] 'heart'	[wen.ʈʂu] 'man'	[wiŋ.ka] 'foreigner'				4
(C)V.CVC	[e.kuʎ] 'shawl'	[ki.ɻif] 'wind'	[ma.win] 'rain'	[pu.ʈʂem] 'tobacco'	[i.ʈʂar] 'seed'			5
CV.CV	[tʃa.ʎa] 'pot'	[θo.mo] 'woman'	[ku.ɻa] 'stone'	[ma.pu] 'land'	[ɻu.ka] 'house'	[ʈʂe.wa] 'dog'		6
							Total:	22

The tokens were randomised for presentation, with each subject being asked to perform the entire task twice, with two different presentation orders. Thus, each subject was ultimately presented with a total of 220 words for evaluation (110x2=220). A five

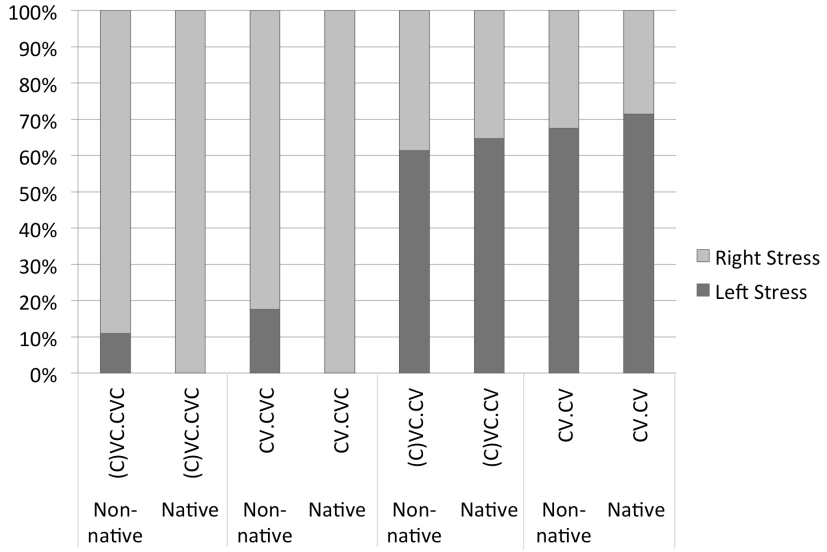
[5] Although for each noun type there are five tokens – each one a recording of a separate native informant – the task actually contained a total of seven voices. Only the clearest five tokens of each word were used in the task.

to ten minute pause was given between the two blocks. Participants were given 1500 ms per word to press one of two buttons: left for initial stress, right for final. Figure 3.4 shows the presentation procedure. A beep, followed by 200 ms of silence preceded every new stimulus. After every ten items, a 5000 ms break was given, marked by three beeps.

Figure 3.4: Presentation of stimuli

Results After preliminary analysis, ten of the target tokens were eliminated, either due to a large percentage of omissions ($\geq 25\%$) or due to contradictory responses across different randomisations in a single participant (in four or more subjects).[6] An even 100 tokens remained per randomisation.

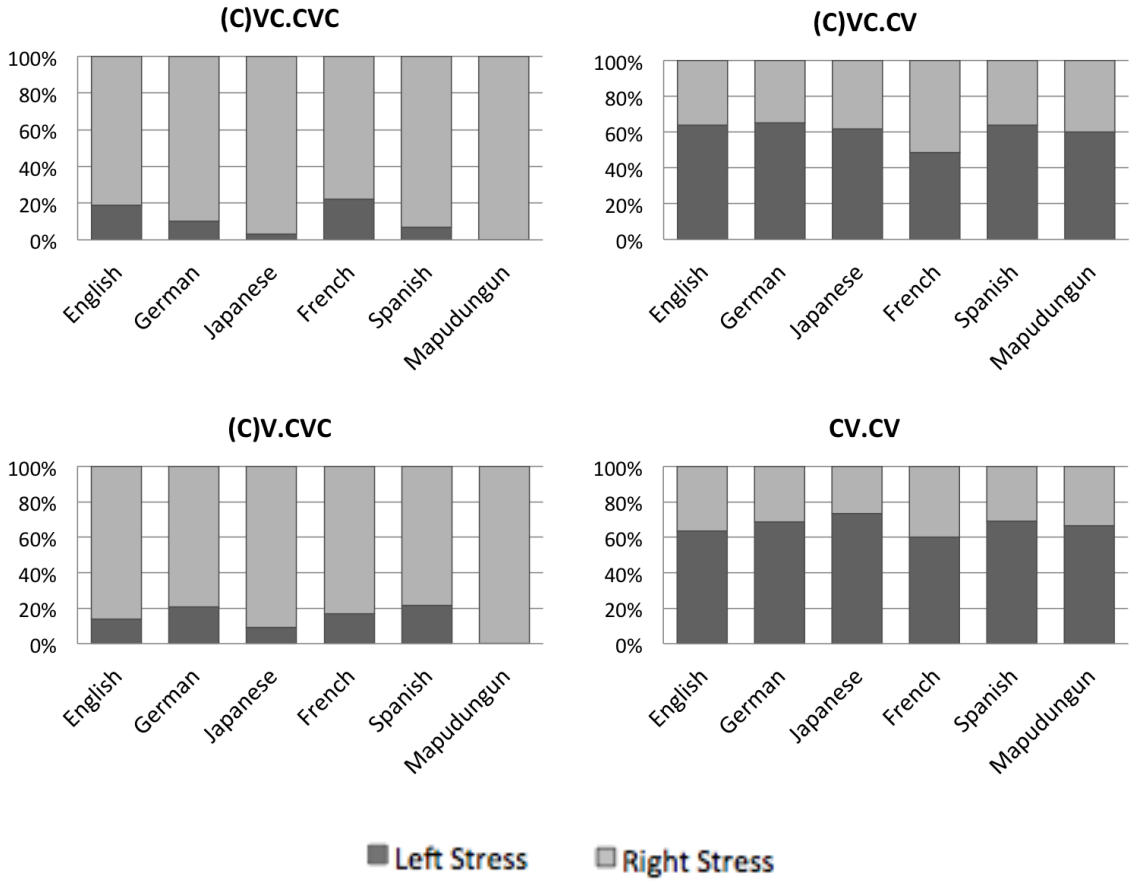
Figure 3.5: Non-native (all languages) vs. native perception of stress-position in disyllables by syllable structure



[6]In most cases, the original sound file had either ambient noise or atypical intonation.

A first approximation assessed the data according to syllable structure. As is evident in Figure 3.5, there is a clear-cut distinction between final open and closed syllables among non-native speakers (two tailed t-test: $p<.0001$), with stress being perceived overwhelmingly on a final closed syllable. Overall, these results parallel the data from native speaker intuition, as given in the matched columns.

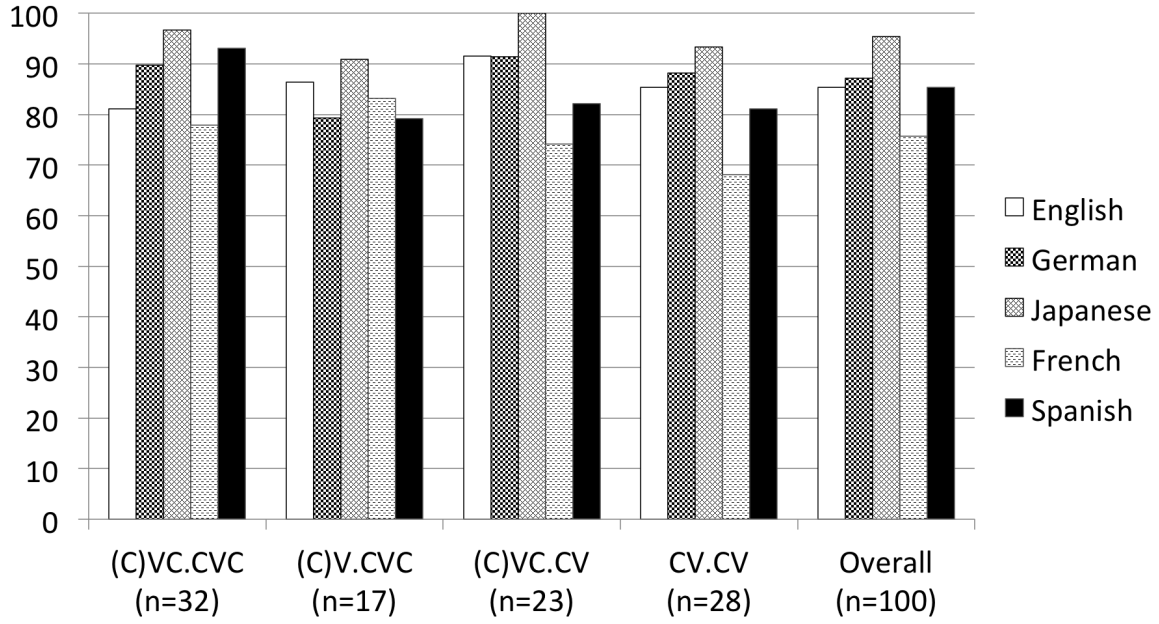
Figure 3.6: Perceived position of stress for Mapudungun disyllables, by L1 and syllable structure



The second step in the analysis involved grouping results according to language background and comparing them individually to native speaker intuitions. First, the overall frequency of left and right-edge stress was compared, according to syllable structure (Fig. 3.6). Then, individual Mapudungun speakers' judgement of a token

word was compared to the response given for that token by each individual speaker of another language (Fig. 3.7). Judgements were grouped by native language and syllable structure.

Figure 3.7: Percentage match of native to non-native speaker stress perception, by L1 and syllable structure



Although there is some variation from language to language (Fig. 3.6), the trends are consistent throughout, with final closed syllables being overwhelmingly perceived as stressed, and final open syllables lacking stress in over half of the cases.[7]

In the one-to-one correspondence of native to non-native speaker stress intuitions (Fig. 3.7), Japanese listeners were found to be the most similar, while, in most cases, French listeners were the least. This said, listeners of all languages show an overall accuracy rate above 75% (75.7% for French, 95.5% for Japanese). Difference in native language, therefore, appears to be only marginally relevant to the perception of

[7]French speakers' perception of (C)VC.CV words, with 51.6% final stress, seems to be the only exception. Elsewhere, these speakers follow the general pattern, even if often to a lesser extent. Furthermore, even in the worst of cases, French speakers match 68% of the Mapudungun intuitions (cf. Fig. 3.7), while being generally biased towards final stress though not truly 'stress deaf' in the sense of Dupoux et al. (1997, 2008).

Mapudungun stress, as intuitions overwhelmingly match those of native speakers.

Discussion Overall, the results of the non-native speaker perception experiment give relatively clear answers to the questions proposed in 3.3. It appears that the cues for Mapudungun stress are salient enough to be perceived by speakers of languages with clearly different stress/accent systems. Furthermore, the convergence between Mapudungun and Spanish speakers in the perception of stress is only average as compared to the convergence of Mapudungun and other languages, with the closest, in fact, being Japanese. As a result, we may claim that the Mapudungun stress system remains somewhat independent from Spanish, at least as regards its perceptual cues.

Non-native intuitions The observed convergence between native and non-native stress perception suggest, firstly, that cues for stress are relatively robust. Crucially, from a methodological standpoint, it implies that native speaker intuitions are reliable indicators for stress position. Furthermore, it means that – at least for Mapudungun – non-native speakers can be fairly good judges of the position of stress, and their assessments cannot therefore be brushed aside lightly.

The first major consequence of this finding relates to reconstructing earlier stages of the language. It is fair to say that, if non-native speakers today are able to give an accurate assessment of Mapudungun stress only 1.5 seconds after hearing a word, we can put greater faith in the grammarians who, in the past four centuries, spent decades in Mapuche communities, usually as missionaries, coming to grips with the language and its stress system. Ultimately, the new data provides greater support for the claims made concerning the diachrony of the language's stress system (cf. Chapter 5).

The second issue stemming from the consistency of non-native perception of stress concerns the assessment of the proficiency of speakers of Mapudungun today. It was discovered during fieldwork that the single subject who, upon further probing, admit-

ted to having learned the language only in his late-teens, displayed no alternation in disyllabic stress.[8] The subject assigned final stress to disyllables across the board, in a pattern that, of course, differed from Spanish, but which also failed to capture the subtleties of the native Mapudungun system.

Finally, the experimental data can help ascertain the language's overall stress assignment system. It provides further corroboration of Mapudungun nominal stress as clearly weight sensitive, especially with regards to the final syllable, which is without exception stressed when closed. The data for disyllables, however, is insufficient: both a right-left moraic trochee or a left-right iamb could explain the non-alternating forms (cf. Table 3.5c,d) as well as a part of the alternating ones (Table 3.5a,b).[9]

Table 3.5: Moraic trochee vs. iamb in disyllabic nouns

	Moraic trochee right-left, ER: right	Iamb left-right, ER: right	Example and gloss
a.	(L̲L)	(LL̲)	[kú.ɻa] ∼ [ku.ɻá] 'stone'
b.	(H̲)L	(H̲)L	[píw.ke] ∼ [piw.ké] 'heart'
c.	L(H̲)	(LH̲)	[kɨ.ɻ́if] 'wind'
d.	(H)(H̲)	(H)(H̲)	[l̻af.kén̻] 'sea'

The alternating forms (Table 3.5a,b) remain difficult to explain in a parametric system. One reason for the alternation might have to do with how the language deals with degenerate feet. Mapudungun has no minimal word conditions, accepting a single light syllable as a content word (cf. *we* 'young/new'), a fact explicitly mentioned by Hayes (1995: 88) and related to a weak restriction on degenerate feet. In such a case, words of the type HL (Table 3.5b) may sometimes be parsed as two independent feet, with the end rule assigning stress to the rightmost. This does not, however, account for the LL-type words (Table 3.5a). A further possibility is that these words are

[8]Data for this subject is not included as part of the analyses, examples or stimuli elsewhere in this study.

[9]Following Hayes (1995): Moraic Trochee: (L̲ L) or (H̲) and sometimes (L̲). Iamb: (L H̲) (H̲) (L L̲) and sometimes (L̲). Where L=(C)V and H=(C)VC. ER=End Rule.

particularly susceptible to other, higher level prosodic processes, such as phrase-final lengthening.[10]

Independence of Mapudungun stress The experimental results do not initially appear to support the idea that the Mapudungun stress system is independent from that of Spanish in the bilingual speaker's prosodic grammar. This is due to the fact that Spanish and Mapudungun speaker intuitions match up in 85.4% of tokens. This could be a very high proportion, suggesting an influence of the dominant language over the contextually restricted one, if it were not for the fact that it only shows an average level of correspondence as compared to other sampled languages. The results of a t-test show that the difference between the percentage of matches for Spanish as opposed to the other languages is not significant (p=.53).

In addition to Mapudungun stress perception not being cued in a particularly 'Spanish' manner, the position of stress differs between the two languages in an important way: where Spanish nouns are almost invariably stressed on the penultimate mora (cf. e.g. Harris 1996: 871), Mapudungun clearly allows variation in vowel-final disyllables.[11] Neither perceptual cues, nor the position of stress in the dominant language, then, provide clear evidence for the superimposition of Spanish stress on Mapudungun.

The alternation of stress in Mapudungun disyllables, furthermore, cannot be viewed as a contact phenomenon, as it is attested well before the period of the most intense contact between the languages from the end of the nineteenth century onwards (cf. §5.5.5). Although the first explicit claims regarding disyllabic alternation surface only half a century ago (Echeverría 1964), the textual evidence points to its existence earlier in the history of the language.

[10]This may be precisely what is suggested by Febrés (1765: 8), with regards to final syllables being pronnounced 'long' in formal contexts, an issue we examine more carefully in Chapter 5, specifically in §5.3.2.2.

[11]Exceptions to this rule are mostly in borrowed nouns: [raβí] 'rabbi'; [menú] 'menu'.

Early grammars all mention the existence of exceptions in their stated stress assignment system. Particularly in Febrés' 1765 grammar we find mention of stress shifting to a final open syllable, where it would normally fall on the penultimate mora. The alternation is restricted to words before pauses in formal speech. His examples, interestingly, are all disyllables: *mapú* 'land', *wenú* 'good', *mitá* 'again' (1765: 8).[12] Moreover, in the first texts with 'exceptional' stress marked in writing (cf Lenz 1895-1897; Augusta 1910, 1916), nouns mostly surface with stress on the ultima of vowel-final disyllables (see §5.5.4 for a more in depth discussion of this data).

Loanword stress provides additional evidence for the independence of present day Mapudungun stress assignment: just as Mapudungun borrowings into Chilean Spanish are reliably stressed on the penultimate mora (cf. Table 3.6), the fieldwork shows that Spanish disyllables are borrowed into Mapudungun with the alternation described here for native Mapudungun nouns (cf. Table 3.7). In other words, lexical items are not borrowed wholesale, but fit into an independent prosodic system.

Table 3.6: Chilean Spanish loanword stress

Original Mapudungun	In Spanish
[ɻú.ka] ∼ [ɻu.ká] 'house'	[rú.ka] 'Mapuche hut'
[kíl.ʈ̪so] ∼ [kil.ʈ̪só] 'dog'	[kíl.tɾo] 'stray dog'
[ka.wíɲ] 'celebration'	[ka.wín] 'gossip'

Table 3.7: Mapudungun loanword stress

Original Spanish	In Mapudungun
[ʋá.ka] 'cow'	[wá.ka] ∼ [wa.ká] 'cow'
[táβ.la] 'board'	[táf.la] ∼ [taf.lá] 'board'
[ɾo.d̪ón] 'roller'	[ɻo.θón] 'roller'

[12] 'Quando [los mapuche] hablan en tono de sermón, que llaman *coyaghtun*, todas las palabras en que hacen pausa, las pronuncian largas.' When the Mapuche speak as befits a sermon, which they call *coyaghtun*, every word where a pause is made is pronounced long [i.e. with final stress] (Febrés 1765: 8).

New fieldwork, coupled with contemporary and historical accounts, allows us to say with some certainty that penultimate mora stress in Mapudungun monomorphemic nouns has remained unchanged for at least two hundred and fifty years.[13] The major exception to this rule is the alternation in vowel-final disyllables, for which we have evidence for a similar period of time. The experimental evidence given here shows that the alternation is not superimposed by centuries of contact, but has long been an independent, native feature.

The value of non-native speaker intuitions Although non-native and even native intuitions have been considered suspect diagnostics for phonological knowledge (cf. Werker & Tees 1984; Dupoux et al. 1997, 2008), when it comes to stress, the essential fact is that no single defining factor can be isolated without the input of speaker intuitions. De Lacy (forthcoming) makes an important point: 'Even if intuitions are a delusion, in some cases they are a shared and consistent delusion, and the source of the delusion might provide insight into phonological knowledge' (§3.7). This is precisely the case for Mapudungun: whatever the reason behind the alternation in disyllable stress placement, this alternation is consistently perceived by both native and non-native speakers and is clearly restricted to words with final light syllables.

Using data from non-native speakers to assess native speaker intuitions is useful insofar as it gives further support to what at first blush appears to be rampant alternation. It can therefore provide us with an additional means of evaluating unexpected patterns which may otherwise be naïvely attributed to contact-induced attrition. It also allows us to extrapolate and give greater reliability to accounts of bygone eras for which we have no subjects or recordings to rely on. Finally, it is crucial in informing our understanding of stress-pattern and cue preservation, both at the level of the

[13]The case of verbs, where suffixation is both abundant and complex, requires further consideration.

individual and of the language as a whole.

3.2.2 Trisyllabic nouns

Although three-syllable, monomorphemic nouns are far less common in the language than two-syllable ones are, a reasonable number of them do surface in common use.[14] Nouns longer than three syllables, however, all seem suspect, being either morphologically complex (cf. *karukatu* 'neighbour', alternatively, *ka-ruka-tu* 'other-house-ADV') or not being truly part of the language's native vocabulary (cf. [go.weɻ.na.oɻ] 'governor' Ch. Sp. ⟨gobernador⟩ [go.ʋeɾ.na.óɾ]). Trisyllables will, therefore, be considered the longest monomorphemes in the language. The analysis of PDM's phonologically-determined stress assignment is hence conducted on the basis of di- and trisyllabic nouns alone.

Table 3.8: Trisyllables: Attested, rare, and unattested syllable structures

a.	(C)V.(C)V.(C)V	*ma.wi.θa* 'woodland'; *o.ko.ri* 'Harris' hawk'; *e.ko.ta* 'sandal'; *ʈʂu.ʈʂu.ka* 'Mapuche wind instrument'; *ko.ʎe.ʎa* 'ant'; *katʃiʎa* 'wheat'; *pa.ta.ka* 'hundred'; *sɨ.mi.ta* 'boiled bread'.
b.	(C)V.(C)VC.(C)V	*a.nuŋ.ka* 'plant'; *pi.fɨʎ.ka* 'two-tone flute'; *ʈʂi.pan.tu* 'year', *ra.wiŋ.ma* 'parrot'; *i.nal.tu* 'edge, shore'.
c.	(C)V.(C)V.(C)VC	*a.li.wen* 'tree'; *a.tʃa.waʎ* 'hen'; *i.ja.el* 'food'
d.	(C)VC.(C)V.(C)V	**rare:** *puŋ.pu.ja* 'armpit', *koʎ.ko.ma* 'coot'; *tʃom.pi.ru* 'hat' (cf. Sp. *sombrero*)
e.	(C)V.(C)VC.(C)VC	**rare:** *a.tʃuʎ.peŋ* 'floating ash'.
f.	(C)VC.(C)V.(C)VC	**unattested** (possibly *liw.pɨ.jiŋ* 'pine bush', cf. Smeets 2008: 308)
g.	(C)VC.(C)VC.(C)V	**unattested**
h.	(C)VC.(C)VC.(C)VC	**unattested**

Not all the possible distributions of open and closed syllables are attested, and in

[14] A quick look at Augusta's dictionary (1916), as well as the glosses in Zúñiga (2006b) and Smeets (2008) shows that monomorphemic trisyllables make up no more than 20% of Mapudungun nouns, of which near three-fourths are borrowed from Spanish.

some cases the forms are very rare, being difficult to elicit in fieldwork. The most common structure is that where all three syllables are open, followed by cases where two of the syllables are open, either the ultima or the penultimate syllable being closed.

3.2.2.1 Native speaker intuitions

In the same elicitation and discrimination task as for disyllables, native speakers were asked to produce and assess the position of stress in trisyllables of the three most common word structures (Table 3.8a-c). Subjects had very definite intuitions as to the position of stress. More so, in fact, than in the case of disyllables. They closely followed the description in most of the preceding phonological work: stress the last vowel before a consonant.

(3.4) Stress in trisyllables:

a. *ma.wí.θa* 'woodland' b. *a.tʃa.wáɾ* 'hen' c. *a.ní̀m.ka* 'tree'

3.2.2.2 Acoustic analysis

A sample of 22 trisyllables were taken from the recordings in our fieldwork, representing the structures CV.CV.CV (LLL), V.CV.CVC (LLH), and V.CVC.CV (LHL) (see Table 3.8 above). Two of the tokens were excluded as they were considered to have a rising, question intonation (cf. §1.2.1.3). Once again, paired t-tests were conducted comparing (primary) stressed syllables – according to native speaker reports – to unstressed (or non-primary stressed) ones. Segmentation, tagging and statistical analysis were conducted in identical manner as per disyllables (§3.2.1.2). Results are reported for overall difference between the stressed syllable and unstressed ones, as well as for difference between stressed syllable, and first the rightmost and then the leftmost unstressed one. Finally, the same differences are reported for the three different syllable-structure conditions.

F0 maxima: The vast majority of the overall word maxima were in the syllable reported as tonic (19/20), the vowel F0 peaks being significantly higher overall than unstressed syllables (N=40; mean difference, 37.6 Hz; $p<0.0001$). Stressed syllables were also an average 37.9Hz above the rightmost unstressed syllable, and 37.3Hz above the leftmost unstressed syllable. In both cases the difference was identically significant (N=20 $p<0.0001$). In each of the syllable structure conditions, overall differences were also highly significant (LLL: N=14 $p<0.0007$; LLH: N=14 $p<0.0001$; LHL: N=12 $p<0.0003$).

Figure 3.8: Waveform and pitch tracks for [a.ʈʂa.wáʎ] 'wind' perceived as finally stressed

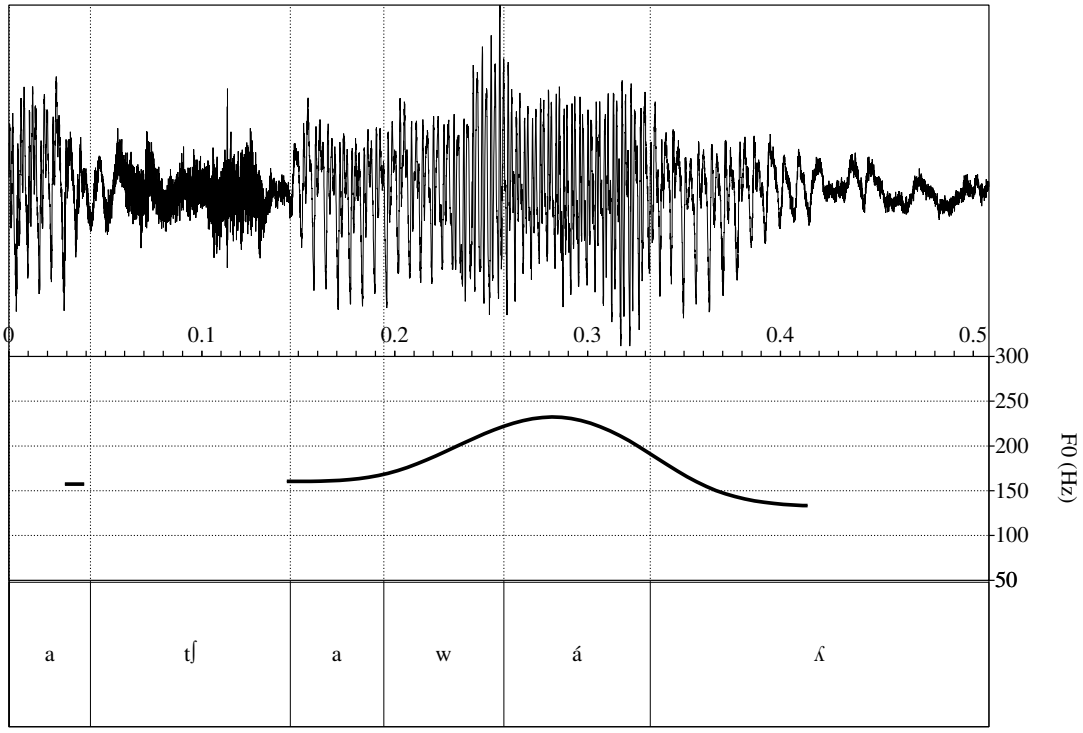
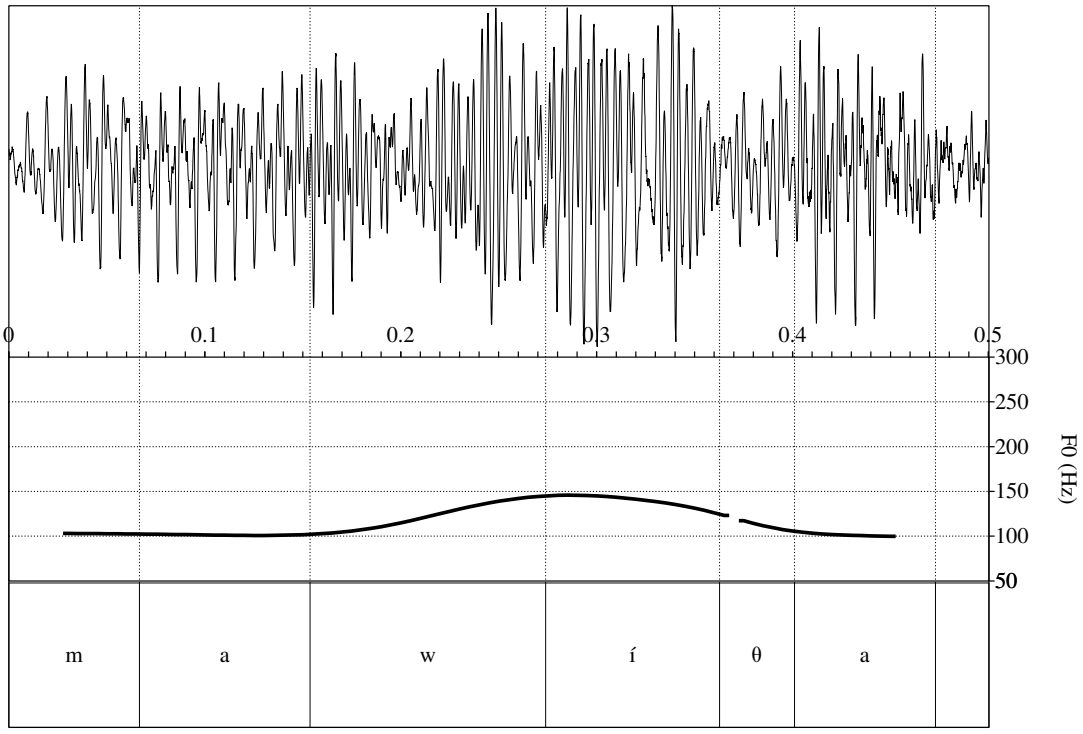


Figure 3.9: Waveform and pitch tracks for [ma.wí.θa] 'wind' perceived as penultimately stressed



Duration: Syllables perceived as stressed were usually longer than non-stressed syllables (mean difference=61.4ms; n=40, p>0.0001). However, although the comparison of the stressed syllable to the leftmost unstressed syllable revealed the former to be significantly longer (N=20; p<0.0001) the comparison to rightmost unstressed syllable showed no significant difference (N=20; p<0.0848). Again, syllable structure is likely to be a conflicting factor, CVC syllables being inherently more likely to be longer than V or CV syllables. A closer look at our data with an eye to syllable structure, however, shows this factor not to be a determinant one. In the crucial CV.CV.CV condition, stressed syllables were not significantly longer than unstressed ones (N=14; p=0.3638).

In the other two conditions, however, the stressed (closed) syllable was significantly longer (LLH: N=14; $p<0.0001$; LHL: N=12; $p<0.0019$).

Intensity: Finally, the amplitude maxima for the nucleus of the syllable perceived as stressed was larger in only a marginally greater number of words (13 out of 20), the mean difference between stressed and unstressed syllables was only of 2.5 dB, which is likely insufficient for a categorical difference in perception (cf. Beckman 1986). A significant correlation was found, nevertheless, between syllable-nuclei intensity maxima and syllables with perceived stress, both overall (N=40 $p<0.0001$) and in individual comparisons to unstressed vowels (rightmost: N=20 $p<0.0035$; leftmost: N=20 $p<0.0015$). In the individual syllable-structure cases, the differences are also significant (LLL: N=14 $p<0.0361$; LLH: N=14 $p<0.0010$; LHL: N=12 $p<0.0262$).

Overall: As in the case of disyllables (see §3.2.1.2, above), acoustic measures show speakers perceived the position of stress to be strongly correlated to vowel F0 maxima and – to a certain extent – to intensity peaks. Syllable length, though found to be related to stress overall, was not significantly different in the case where stressed syllables were compared to the rightmost unstressed syllable, nor in the crucial case where all syllables had onsets and no coda.

3.2.2.3 Acoustics II: secondary stress

Although no native speaker intuitions were gathered for secondary stress, some trisyllables could potentially have a third degree of prominence aside from stressed and unstressed. From both a typological and an operational standpoint, it was only possible to conduct these measures where two (non-primary stressed) open syllables were adjacent, that is, in the LLH type. In this case, both pitch and intensity were compared in a matched pairs analysis.

Although the number of tokens was small (N=8), a significant difference in favour of the second syllable was found as regards pitch maxima (avg. difference = 13.4 Hz; $p<0.0468$), but not with intensity (mean difference= 2.3 Db; $p<0.096$). Although it is tempting to assume that this indicates a degree of stress on the second syllable of LLH trisyllables, the small number of tokens and the correlation being restricted only to pitch maxima makes the analysis inconclusive.

3.2.3 Nouns in context

One of the suggestions that surfaces time and again in the literature regarding the variability in Mapudungun stress is that there are phrasal phenomena at work, reassigning stress within particular morphosyntactic positions (cf. Febrés 1765: 8, Lenz 1893: 202, Suárez 1959: 178, Echeverría 1964: 48, Smeets 2008: 49, Zúñiga 2006b: 65, as well as our own account of stress at the turn of the twentieth century §5.30). None of the accounts that propose this idea, however, goes on to deal with the actual instantiation of such phenomena. The fact that the preceding section deals only with words in isolation does little to address the issue, so in what follows we attempt to provide some systematic data in order to test these long-standing claims.

The fieldwork data for tasks C-E in 3.1 provide us with a number of sentences which include the nouns from Task A – presented in §3.2 – in different syntactic contexts. Although the structure of the answers to questions and the translations of sentences showed some variation from speaker to speaker, the general outcome of the tasks provides us with a good number of tokens for most of the studied syllabic structures, in the different target syntactic positions. Although the focus is mostly on vowel-final disyllables, some evidence for consonant-final disyllables and trisyllables ending in vowels and consonants is also provided.

Evidently, the syntactic position for a lexical item within a sentence is not a straight-

forward matter. There is, of course, more than a single point of reference or position which may affect stress-position at the phrasal level in each instance (note, for instance, that in 3.5-2 *wiŋka* is both pre-verbal and utterance initial). Here we give each of the factors independently, and examine their interaction on a case to case basis, as needed.

(3.5) Examined phrasal positions for target (underlined) nouns' stress:

1. Utterance final:

   kɨʈʂan-tu-le-j *ɲi* *piwke.*
   hurt-REST-PROG-IND.3 her heart
   'It is hurting her heart'

2. Utterance initial:

   wiŋka *puʈʂem-tu-ke-j.*
   foreigner tobacco-VB-HABIT-IND.3
   'the foreigner smokes tobacco'

3. Pre-verbal:

   tufatʃi *wenʈʂu* *pe-rke-fi-j* *tʃi* *ɨʌtʃa.*
   this man see-REP-3SP-IND.3 the girl
   'this man, they say, saw the girl'

4. Pre-nominal:

   ejmi *ɨʈʂɨf-tuku-la-j-m-i* *kura* *lewfɨ* *mew*
   you throw-put.in-NEG-IND-2-S stone river POST
   'you do not throw stones in the river'

5. Pre-*mew*:

   eymi *ʈʂipa-la-imi* *tufatʃi* *mapu* *mew.*
   you exit-NEG-IND-2-S this land POST
   'you do not leave the country'

Although the scope of this study does not allow for a full articulation of the syntax-prosody relation within the language, an examination of these key positions within the utterance and their potential incidence on stress is considered necessary. This data for nouns in context is later placed in counterpoint as with the findings for words in isolation.

The position of stresses in nouns was assessed, in this case, impressionistically, and any unclear cases were discarded. Attempts were made to control for issues such as focus, but repeated need for prompting and guidance – particularly amongst the eldest speakers – made this particularly difficult. A total of 336 utterances were deemed adequate for analysis and are reported on below. Among these sentences, 595 instances of nouns in the specific contexts for analysis were identified.

Table 3.9: Stress position in nouns (Penultimate = PU, Final = F) by syllable structure and syntactic position

	Utt.Final		Utt.Initial		Pre-Verb		Pre-Nom		Pre-*mew*	
	PU	F	PU	F	PU	F	PU	F	PU	F
CV.CV	42%	**58%**	—	**100%**	7%	**93%**	8%	**92%**	33%	**67%**
	(22)	(30)	—	(14)	(5)	(64)	(2)	(24)	(19)	(39)
CVC.CV	29%	**71%**	—	**100%**	11%	**89%**	13%	**87%**	37%	**63%**
	(16)	(39)	—	(16)	(10)	(85)	(4)	(28)	(10)	(17)
CV.CVC	—	100%	—	100%	—	100%	—	100%	—	100%
	—	(28)	—	(2)	—	(19)	—	(13)	—	(1)
CVC.CVC	—	100%	—	100%	—	100%	—	100%	—	100%
	—	(38)	—	(8)	—	(11)	—	(23)	—	(8)
$\sigma.\sigma$.CV	89%	11%	100%	—	100%	—	100%	—	100%	—
	(16)	(2)	(3)	—	(2)	—	(2)	—	(5)	—
$\sigma.\sigma$.CVC	—	100%	—	100%	—	—	—	100%	—	—
	—	(4)	—	(2)	—	—	—	(1)	—	—

Somewhat reassuringly, we note that the general pattern for most nouns is identical to what we find in the nouns in isolation. While all nouns ending in a consonant were invariantly stress-final, and trisyllables ending in a vowel were penultimately stressed, the first two noun types – disyllables ending in a vowel – showed alternation. Although

the fact that alternation does occur is well attested in the nouns in isolation data, the striking fact here is the much greater proportion of final open syllables which bear stress, regardless of the syntactic position.

A closer look at the different analysed syntactic positions, furthermore, shows that the tendency towards final stress in the alternating forms does not seem to be subject to any of the target positions in particular. As a matter of fact it appears that the greatest difference in proportions of final and penultimate stress is not between any of the given phrasal positions but between the noun in running speech and the noun in isolation.

Table 3.10: Final stress on disyllables ending in a vowel: in isolation (cf. Table 3.1) and in running speech

	In Isolation	In Running Speech
CV.CV	38%	78%
CVC.CV	40%	82%
Overall σ.CV	38%	82%

Discussion: Overall then, in running speech, the pattern we are left with is one where the final syllable of disyllabic nouns has priority over the penult in terms of stress assignment. In the case of consonant-final disyllables, this priority is categorical, while in the case of vowel-final ones, it is gradient. For trisyllables, the pattern seems to be identical to that of nouns in isolation, with stress falling on final closed syllables or on the penult when the final is open.[15]

The fact that the proportion of stressed final vowels in disyllables practically doubles when comparing the data in context to that in isolation, seems to point to the fact

[15]There are two exceptions in our data, both of them for the word *mawiθa* 'woodland' in utterance-final position: *tufátʃi θomó pe-ɲmá-fi-j ajwíɲ tʃi mawiθá* 'this woman see-APPL-3SP-IND.3 shadow the woodland' (this woman saw the shadow of the woodland); *tufátʃi θomó iʦ̪if-tu-fí-j kiɲe kurá chi mawiθá* 'this woman throw-ASPCT-3SP-IND.3 the stone woodland' (this woman threw the stone into the woodland).

that the default position for stress overall is that of the final syllable and that it is a peculiarity of enunciating words in isolation that leads to a greater amount of stress-initial forms. If we further consider the proportion of stress-final forms in utterance-final position as opposed to utterance-initial, pre-verbal and pre-nominal forms (cf. Table 3.9 – we deal with the pre-*mew* cases separately) we find that the first group differs importantly from the latter ones, being much closer to the data for nouns in isolation, than the rest of the forms.

Table 3.11: Stress position in nouns (Penultimate = PU, Final = F) words in isolation and utterance final vs. utterance initial, pre-verbal and pre-nominal

	Isolation		Utt.Final		Utt.Initial		Pre-Verb		Pre-Nom	
	PU	F	PU	F	PU	F	PU	F	PU	F
CV.CV	**63%**	37%	42%	**58%**	—	**100%**	7%	**93%**	8%	**92%**
CVC.CV	**60%**	40%	29%	**71%**	—	**100%**	11%	**89%**	13%	**87%**

Although the data is not clear cut, there is certainly a disjunction between the distribution of stress in isolation and the three final syntactic positions (initial, pre-nominal and pre-verbal). Furthermore, the words in isolation are – by definition – also utterance final, so it is not altogether surprising that they pattern the closest with the data for this syntactic position. This data, however, contradicts the idea that utterance final syllables draw stress, as was claimed in Febrés (1765: 8) for the context of formal speeches (cf. fn.12, §5.3.2.2). It seems, rather, that stress avoids the right edge of the utterance, whether it be a single word or a full intonational phrase. The process, as we have seen, is restricted to final open syllables, specifically within disyllables. Furthermore, it does appear to apply – although less often – to utterance-internal words.

In the case of the nouns followed by *mu* ∼ *mew*, the position of stress is less obviously related to the general pattern of the syntax, but more to the local interaction of the noun and the postposition. Though the presence of the final glide vs. the final

assimilated vowel (i.e.: /e/>[u]) in the postposition is difficult to ascertain, it does seem to be the case that stressed forms are closed, while unstressed ones are open. Alternation, however, is an unavoidable part of the system. There appears to be a preference for the syllable preceding the stressed postposition to have stress on the penultimate, but again, this is only a tendency.

(3.6) Stress in disyllabic nouns followed by *mu* ∼ *mew*

a. *epú* *wéntsu* *tsipá-la-j* *mápu* *méw*
two man exit-NEG-IND.3 land POST
'the two men did not leave the country'

b. *tufátʃi* *wentsrú* *itsif-i-j* *putsém* *mapú* *méw.*
this man throw-ind-3s cigarette land POST
'this man threw the cigarette to the ground'

c. *ejmú* *kon-tu-á-j-m-u* *rúka* *mu*
we$_{D}$ enter-REST-FUT-IND-2-D house POST
'we will both go back into the house'

It appears that cases such as those in (3.6a) are most common overall, the postposition taking stress at the end of the utterance and stress falling on to the penultimate syllable of the preceding vowel-final noun. However, there are cases where the stress on the final syllable clashes with that of the postposition (b), as well as cases where stress is on the initial syllable on the noun even when there is no stress on *mu* (c).

Although the data here is ultimately inconclusive as regards the interaction of syntactic position and stress, we do find that context and lack thereof is an important factor in conditioning the likeleyhood of initial or final stress. An important feature that must be taken into account here is that of register. Since the elicitation of nouns in isolation took place in the context of guessing the word that was represented by a particular flash card (Task A, cf. §3.1: 3.1, and Appendix A), it was noticeably less formal than Tasks C-E, where speakers were asked to follow a rather formulaic pattern

of question and answer in full sentences, or translation of full sentences. We will return to the question of register in our more general discussion on stress assignment in the language, at the end of the next chapter (§4.5.2).

3.2.4 Summary of new data for simplex nouns

The data for nominal stress we have provided comes from a series of di- and trisyllables gathered through fieldwork interviews and listed both in isolation and in controlled phrasal contexts. Native speaker judgements regarding the position of stress were obtained for the forms in isolation, and these were paired with the acoustical signal, finding the fundamental cue for stress to be a significantly higher pitch maximum for stressed syllables.

For the case of disyllables, non-native speaker judgements of the position of stress were also gathered in an auditory forced decision task. The experimental results showed that non-native speaker judgements were consistent, overall, with those of native speakers, giving further reliability to the latter. Furthermore, native speakers of Chilean Spanish obtained only average accuracy judgements for the position of stress as compared to the native Mapudungun speakers, supporting the idea that, at least at a perceptual level, the two phonological modules in Mapudungun-Spanish bilinguals' grammars are somewhat independent as regards stress.

The overall pattern for the position of stress was seen to be straightforward for most syllabic structures within nouns. All words ending in a consonant were invariantly stress-final, while words ending in a vowel diverged depending on their number of syllables. Vowel-final trisyllables were almost invariantly penultimately stressed, both in context and in isolation. In the case of vowel-final disyllables we find widespread alternation: In isolation the tendency is to stress the initial syllable (regardless of weight); in context the final syllable takes priority as regards stress assignment.

3.3 New data for nominal compounds

3.3.1 Compound structure

Although suffixation is comparatively rare for nouns in Mapudungun, the concatenation of free nominal stems into compounds is highly productive. Nominal incorporation and serial verb constructions (SVCs) can also be understood as forms of verbal compounding (V+N and V+V, respectively). According to Baker & Fasola (2009) verbal and nominal compounds are 'frequent and productive in Mapudungun, and constitute an important part of the language's overall polysynthetic quality' (p. 594, see also §1.2.2.1).

The peculiarity of nominal compounding in the language is that it displays both head-initial and head-final forms (cf. Baker & Fasola 2009: 598). This is interesting since, overall, the language makes use of pre-specification for nouns in adjectival and determiner constructions. The head-initial forms are, therefore, a rarity within the grammar. They are also less frequent among the language's compounds overall, and are significantly restricted in their semantics. When it comes first, the nominal head is limited to a relational role, indicating the whole to which the dependant noun belongs to as a part, or, is in a relation of provenance (Table 3.12b) or containment to (Table 3.12c).

Table 3.12: Head-final and head-initial N+N compounds (from Loncón Antileo 2005 and Smeets 2008, in Baker & Fasola 2009)

	HEAD-FINAL		
a.	*mapu-tʃe*	land-people	'the Mapuche people'
b.	*ilo-korɨ*	meat-soup	'soup containing meat'
c.	*pulku-fotiʎa*	wine-bottle	'wine bottle' (a type of bottle)
	HEAD-INITIAL		
d.	*ŋe-ʈ̱sewa*	eye-dog	'dog's eye'
e.	*ilo-ʈ̱sewa*	meat-dog	'dog's meat'
f.	*fotiʎa-pulku*	bottle-wine	'a bottle with wine inside'

Baker & Fasola (2009) also point out that both types of structures can be part of a verbal compound, using the language's productive nominal incorporation patterns (cf. §1.7). Ability to incorporate is therefore given as a syntactic test evidencing morphosyntactic wordhood. The fact that compounds behave like words will be important in our analysis of stress after the proposals outlined in §4.3.

New data Tokens for nominal compounds were gathered both in the picture-naming and general-knowledge questions of the fieldwork interviews (cf. §3.1 and Appendix A). A body of 37 N+N compound-types was compiled. 25 among these had two disyllabic stems while 12 including at least one trisyllabic or monosyllabic stem. Varying syllabic and head/dependant structures were gathered as well. Although occasional fine-grained phonetic examination of individual tokens was carried out, the overall assessment of the position of stress was impressionistic, the researcher's intuitions being checked by the main informant (Sergio Catricura). Considering the baseline given by the experimental results for nouns (i.e. non-native perception closely mirrored native intuitions, §3.2.1.3), all forms where stress-position was recoverable were logged, and were considered to be reliable sources for the position of stress.

3.3.2 Disyllabic stems

Table 3.13 gives a summary of the distribution of stress in compounds with two disyllabic stems. Representative examples are organised according to weight of the final syllable of each stem and by headedness of the entire compound. Since we have seen that only the weight of the word-final syllable seems to have an influence on stress position, the table only controls for the presence of a coda in this position (H=heavy/closed; L=light/open).[16]

[16]The noun *piʎán* (or *piʎáŋ*) is generally used to refer to a volcano and the supernatural power associated to it, which is believed to be harnessed in ritual or sacrificial contexts. Other uses of

Table 3.13: Compound structures: weight and headedness (disyllabic roots)

σ-STRUCTURE	DEP-HEAD		HEAD-DEP	
σ.H-σ.H	a.	*pi.ʎán-kɨ.ʎíŋ* ‘power-animal’(sacrifice)	b.	*tʃa.ŋúʎ-n̪a.mún̪* ‘finger-foot’(toe)
σ.L-σ.H	c.	*tʃa.fó-ku.ʈ̪sán* ‘cough-disease’(a cold)	d.	*ʈ̪sa.rí-man-sún* ‘knot-ox’(oxen team)
σ.H-σ.L	e.	*l̪af.ken̪-má.pu* ‘sea-land’(the coast/west)	f.	*n̪a.mún̪-me.sa* ‘foot-table’(table-leg)
σ.L-σ.L	g.	*ku.θi-fóro* ‘morter-bone’(spine)	h.	*fo.ró-tʃaʎ.wa* ‘bone-fish’(fishbone)

The pattern found in Table 3.13 is striking in that, where the final syllable is closed (H), there are two clear stresses (a-d), and where the final syllable is open (L), there is only one stress (e-h). In the two-stress cases, the final syllable of each word takes stress, without a clear dominance of one stress over the other. This seems to suggest that a final closed syllable attracting stress in the second disyllabic stem means that the first stem’s stress cannot be adjacent to the second stem’s, since there will always be an intervening syllable.

(3.7) Compounds with a final heavy syllable (NO-CLASH) – heads underlined:

	*	*		*	*
a.	*tʃa.ŋúʎ-n̪a.mún̪*		b.	*tʃa.fó-ku.ʈ̪sán*	
	‘finger-foot’ (toe)			‘cough-disease’ (a cold)	

Although compounds in the second group of Table 3.13 (e-h) tend to attract a single stress – either to the penultimate syllable of the second word (e-g), or to the final syllable of the first one (f-h) – there are a few cases where stress clash is tolerated, the two possibilities for stress position surfacing simultaneously (on the ultima of the first word and on the penultimate syllable of the second). However, this optionality

the word in compounds are *piʎan-kúʃe* ‘power-old.woman’ (old woman who leads a ceremony), or *piʎán-kɨʈ̪sal* ‘power-fire’ (ceremonial/sacrificial fire).

does not entail that either stress can take the highest level of prominence. There is a clear asymmetry, where one position can either have maximum prominence, or share it with the other position, while the second position can only be maximally prominent when it shares this characteristic with the first (cf. *fo.ró-tʃaʎ.wa* ∼ *fo.ró-tʃáʎ.wa*, but **fo.ro-tʃáʎ.wa*).

For compounds, which syllable is maximally prominent (though it may share this level with another syllable) appears to be determined by its headedness. Where the compound is head-initial, stress is always on the first word (cf. Table 3.13 f-h), where it is head-final, the second word is always stressed (cf. Table 3.13 e-g).

(3.8) Compounds with a final light syllable (CLASH) – heads underlined:

	(∗)		(∗)	
	∗ ∗		∗ ∗	
a.	*fo.ró-tʃaʎ.wa*	b.	*ku.θi-fó.ro*	
	‘<u>bone</u>-fish’ (fishbone)		‘mortar-<u>bone</u>’ (spine)	

3.3.3 Monosyllabic stems

The data for monosyllabic stems within compounds, although sparser than for disyllables, confirms a certain trend within prominence assignment system of Mapudungun. In particular, it shows that both elements of the compound are stressed. It also reinforces the view that the head of the compound takes stress over the dependant, specifically where the two stresses are adjacent.

A further point to be made is that a word-final open syllable may be stressed if it represents a monosyllabic stem. This is particularly the case if it is the head-element of the compound (Table 3.14a), although the dependant may also show stress in careful speech (Table 3.14d).

Table 3.14: Monosyllabic stems within compounds

	HEAD-FINAL		
a.	*l̪af.ken̪-tʃé*	lake-person	‘lake-folk’
b.	*ké.-ku.ʈsán*	liver-disease	‘hepatitis/cirrosis’
	HEAD-INITIAL		
c.	*tʃé.-ma.mɨ́ʌ*	person-wood	‘totem pole’
d.	*rel.mú.-ŋe*	rainbow-eye	‘iris’

3.3.4 Trisyllabic stems

Trisyllabic stems in compounds provide a key piece of data for stress with reference to the leftmost stem. Here there is a divergence from mono- and disyllables, which are stressed on the final syllable of the first stem. In contrast with mono- and disyllables, which always stress the final syllable of the first stem, trisyllables only stress a final *closed* syllable. If the stem ends in a vowel, however, the penult takes stress.

Table 3.15: Trisyllabic stems as first elements in compounds

	HEAD-FINAL		
a.	*wa.rí.ja-tʃé*	city-people	‘cityfolk’
b.	*a.tʃa.waʌ-rú.ka*	hen-house	‘henhouse’
	HEAD-INITIAL		
c.	*i.nál.tu-l̪af.kén̪*	edge-ocean	‘seashore’
d.	*fo.tí.ʌa-púl.ku*	bottle-wine	‘bottle with wine’

Note, then, that where the final syllable of an initial stem is light, there are always two stresses in the word as a whole. In the cases where the final syllable is heavy, it is expected that this syllable be stressed, however, it may be demoted in dependant position, due to clash with the stress of the second stem (cf. Table 3.15b).

3.3.5 Summary of new data for nominal compounds

In nominal compounds, it has been shown, stress falls on each one of the two subordinate stems. In the rightmost, stress falls on a final closed syllable, or otherwise on the penult. If the stem is monosyllabic, it receives stress irrespective of weight. In the leftmost stem, disyllables are stressed finally, regardless of syllable weight. If the stem is trisyllabic, the final syllable is stressed if closed, otherwise, the penultimate is stressed. This asymmetry between di- and trisyllabic stems will be examined in detail in the following chapter (cf. §4.2) in order to formalise the language's overall stress assignment system.

3.4 New data for verbs

The complexity and versatility of polysynthetic verbal morphology in Mapudungun has been the object of much admiration and scholarly attention since the arrival of Europeans to the Southern Cone. Moesbach (1962: 35) states that 'the Mapuche tongue is, *par excellence*, a language of the verb'. Studies of the language tend to be concerned overwhelmingly with aspects of its verbal morphology, suffixation being key to its syntactic and semantic peculiarities (inversion, nominal incorporation, root serialisation, valency changing operations, intricate evidentiality, directionality and argument marking, etc). Such richness of suffixal material allows verbs to create longer phonological words, as well as displaying wider structural alternation, as compared to other word categories. The key question, then, is whether amidst such alternations, the position of stress follows the morphology or whether it relies on the same – phonological – system as simplex nouns.

As we shall see (Chapter 5), early grammars tended to relate stress to the morphology, referring to inflectional paradigms, rather than to edge-relations and syllable-

weight, as do more recent studies (Chapter 2). Crucially, all grammars tend to place some form of stress within the final two syllables of the verb. In the older grammars this tends to be the only stress that is mentioned, but in more contemporary works, a second (and sometimes a third) stress is claimed for longer words, surfacing on the two syllable window at the left edge of the word. The new data in this study agrees with these findings, providing further evidence in order to frame the alternation within these two stress-windows, and providing the key generalisations so as to understand their interaction. The analysis will begin using the lowest common denominator approach: an account of stress without reference to the morphology. The possibility of a purely phonologically-based stress-assignment system is entertained, therefore, before moving on to assessing possible influences of the morphological structure.

3.4.1 Right-edge stress

In order to establish whether rightmost stress in verbs is predictable from the relevant word-edge, first of all, the final two-syllable window of verbs ought to be examined. This will allow an assessment of the right-edge moraic trochee analysis implicitly proposed in the Mapudungun-specific literature. The question is whether an assignment system of this type may be said to hold, or whether a left-right system (such as that in Echeverría & Contreras 1965) must be invoked.

The sheer variety of possible verbal suffixes which can potentially occupy the right edge is seen, for instance, in Smeets's grammar (2008: 177), which assigns one of no less than thirty-six possible slots to each suffix, based on its relative distance from the right edge of the verb. She divides these into inflectional slots (1-15) and derivational ones (16-36) with the latter being either fixed or mobile. In the following section we review some of these suffixes' phonological structure and morphosyntactic role within the grammar.

3.4.1.1 Mapudungun suffixes: slots and functions

Although the analysis of all possible morphological variation in the final syllables of Mapudungun verbs is well beyond the scope of this thesis, we will examine the crucial morphemes in our data according to the slots Smeets (2008) assigns them, supplementing her claims with further clarifications from Salas (2006), Zúñiga (2006b) and other more specialised sources.

Slot 1 *-ew* **'3SP in inverse constructions'** The furthest possible position at the right edge is occupied by what Smeets calls a 'dative subject' marker, *-ew* (2008: 178). In Salas (2006: 109) and Zúñiga's (2006b) terminology this is the second element of a discontinuous morpheme *-e-ew*, indicating a 3rd person agent (number unspecified) in an inverse construction, that is, where this agent is a SP (see §1.2.2).

(3.9) *elu-a-e-n-***ew**
give-FUT-INV-IND.1S-3SP
'me, s/he will give X to'

Slots 2, 3 and 4: PERSON, NUMBER, MOOD **and** NON-FINITE VERBAL FORMS These three slots mark number (of the focal person), focal person, and mood, respectively, all of which are obligatory for finite verbs. This is what Adalberto Salas (2006) terms the 'obligatory finite inflection' (OFI). Where the verb is non-finite, a corresponding non-finite morpheme occupies these slots.

Table 3.16: Example mood, (focal) person and number marking in Mapudungun

ROOT	MOOD	PERSON	NUMBER
ṭ̠sipa	-l	-m	-u
'exit'	SUBJUNCTIVE	SECOND	DUAL

Crucial to the verbal data analysed in the upcoming sections is the mapping of these morphemes to syllable and foot structure. In particular, this is relevant as regards

the alternation of syllabic [i] and non-syllabic [j] in the obligatory finite inflection. We advance here that there appears to be no need to distinguish the two forms underlyingly, and that the alternation is an artefact of their position within the syllable (we mark the underspecified, underlying form as ⟨I⟩).

Considering the mostly agglutinating nature of the language, portmanteau morphemes are thought to be the exception, rather than the rule (cf. Rivano 1989: 150). Some of such exceptions are the first person singular indicative *-n* and the singular forms of the imperative, *-tʃi*, *-ŋe*, and *-pe* (1st, 2nd and 3rd person, respectively). Excluding these morphemes, it is easy to assume that distinct meanings in the paradigms of verbs should be represented by separate morphemes at the underlying level – which is precisely what most accounts tend to do. The language, therefore appears to have little in the way of allomorphy, but does display some regular phonological alternations that may somewhat obscure the agglutinating pattern. The overall 'one-morpheme, one meaning' system for mood, focal person and number can be deduced from the forms given in Table 3.17.[17]

Table 3.17: Mapudungun verbal paradigms, (*ʈʂipa-* 'exit'; *kon-* 'enter'; *pi-* 'say'), based on Salas (2006: 98-107) and Zúñiga (2006b: 105)

		1st	2nd	3rd
IND	Sing.	[ʈʂipan] [konɨn] [pin]	[ʈʂipajmi] [konimi] [pimi]	[ʈʂipaj] [koni] [pi]
	Dual	[ʈʂipaju] [koniju] [piju]	[ʈʂipajmu] [konimu] [pimu]	
	Plur.	[ʈʂipaiŋ] [konijiŋ] [piiŋ]	[ʈʂipajmɨn] [konimɨn] [pimɨn]	
SUBJ	Sing.	[ʈʂipali] [konli] [pili]	[ʈʂipalmi] [konɨlmi] [pilmi]	[ʈʂipale] [konle] [pile]
	Dual	[ʈʂipaliu] [konliu] [piliu]	[ʈʂipalmu] [konɨlmu] [pilmu]	
	Plur.	[ʈʂipaliŋ] [konliŋ] [piliŋ]	[ʈʂipalmɨn] [konɨlmɨn] [pilmɨn]	
IMP	Sing.	[ʈʂipatʃi][kontʃi][pitʃi]	[ʈʂipaŋe] [konŋe] [piŋe]	[ʈʂipape] [konpe] [pipe]
	Dual	[ʈʂipaju] [konju] [piju]	[ʈʂipamu][konmu][pimu]	
	Plur.	[ʈʂipaiŋ] [koniŋ] [piiŋ]	[ʈʂipamɨn][konimɨn][pimɨn]	

Analyses of the underlying structure of the morphemes for mood, person and num-

[17]Note that here a verb-root is given as the item immediately preceding mood-marking. This is by no means the only option. However, the shape of the final three morphemes does not seem to be related the preceding element's root or suffixal nature, but to whether its final element is consonantal or vocalic.

ber tend to agree that the marker of the indicative is /-I/ (surfacing as [-i]∼[-j]). The marker of the subjunctive seems, quite clearly, to be [-l] (with epenthetic [-ɨ] when between consonants), while the non-portmanteau forms of the imperative seem to lack an explicit marker for mood, and are hence assumed to be zero-marked (-∅).

Person marking is much more transparent for the second person ([-m]), than for the first (/-I/), which is often confounded with the indicative marker, and, as we shall see, the singular marker as well. Nevertheless, the dual and plural forms of the subjunctive and the imperative show a very consistent pattern. Finally, the third person appears to have no marking (-∅) in the indicative, and [e] in the subjunctive.[18]

Finally, number marking is only truly obvious in the first and second persons. The third person dual and plural may be marked either periphrastically, or by using the post-verbal clitic forms *(e)ŋu*, and *(e)ŋɨn*. Here, it is evident that [-i]∼[-j] represents the singular, [-u], the dual, and [-n] (palatalised to [-ŋ] after [i]), the plural. In this final case, the epenthetic vowel [ɨ] is inserted when preceded by a consonant.

The case of the third person singular is curious in that the singular marker /-I/ is never fully articulated. While the subjunctive replaces [-i] with [-e], the imperative is marked by [-pe]. In the case of the indicative, the addition of /-I/ would be homorganic with the indicative marker (also /-I/), and hence difficult to perceive. It will be our claim, however, that where the last segment before the indicative marker is a consonant, the '-IND-3-S' marking, which is underlyingly /-I-∅-I/ is realised at some point in the derivation as [-ij], adding weight to the final syllable, and thus making it stressable (cf. p. 146).

[18]The difference in marking for the 1st and 3rd person of the subjunctive singular is peculiar as regards the more general structure of verbal paradigms. As we assume that the underlying form for the two would normally be /-l-I-I/ '-SUBJ-1-S' and /l-I-∅/ '-SUBJ-3-S, the surface [i] > [e] change in the third person seems to be a form of morphological dissimilation, which draws into question the form's truly decomposable, agglutinating nature.

The entire system can be summarised as follows, according to Salas (2006) and Zúñiga (2006b):

Table 3.18: Mood, focal person and number markers in Mapudungun

MOOD	INDICATIVE -i∼j	SUBJUNCTIVE -(ɨ)l	IMPERATIVE -∅
PERSON	FIRST -i∼j	SECOND -m	THIRD -∅
NUMBER	SINGULAR -i∼j	DUAL -u	PLURAL -(ɨ)n

If we assume the forms in the table to be underlying, there is a question as to how the forms are realised, especially the cases where there are surface vowel-glide alternations. All accounts seem to agree with Echeverría (1964: 37), who argues for considering all tautosyllabic sequences including a vowel and a high sonorant ([i/j], [u/w]) to take the latter as glide, rather than vowel (e.g. [kɨ.jen] vs. *[kɨ.ien] 'moon'). Although Echeverría does not examine verbal morphology specifically, he takes this to be a more general constraint on syllable structure banning two successive vowels from the syllable nucleus (e.g. [kɨ.me-j] vs. *[kɨ.me-i] 'good-IND.3').

In Salas' (2006) and Zúñiga's (2006b) grammars the non-syllabic form [j] occurs both intervocalically (cf. /kon-I-I-u/ > [ko.ni.ju] 'enter-IND-1-D') and word-finally following a non-homorganic vowel (e.g. /ʈ̱ipa-I-∅-I/ > [ʈ̱i.paj] 'exit-IND-3-S'). They both agree, however, that a final homorganic sequence of high-front sonorants is simplified to a single vowel (e.g. /pi-I-∅-I/> [pi] 'say-IND-3-S').

Zúñiga (2006b: 105-7) and Salas (2006: 104-5) do allow for a succession of two high/front nuclei across a syllable boundary, as in the indicative and imperative of a 1P verb with an [i]-final root such as, in both cases /pi-I-I-n/ > /[piiŋ] 'say-IND-1-P'. Zúñiga, however, claims the two nuclei are broken up by a glide in the IND-1-P form of a consonant-final root, as in /kon-I-I-n/ > /[ko.ni.jiŋ] 'enter-IND-1-P', while Salas

proposes no intervening glide: [ko.ni.iɲ]. In Zúñiga's data the contradiction between consonant- and [i]-final roots is particularly perplexing, since the forms where the glide onset does not surface are precisely those where the series of supposed underlying homorganic segments is largest (/pi-I-I-n/ > [pi.iɲ], but /kon-I-I-n/ > [ko.ni.jiɲ]).

Also, Salas is less categorical when it comes to nucleus adjacency in indicative 1D forms for vowel-final roots. He tells us that for underlying /ʈ͡ʂipa-I-I-u/ both [ʈ͡ʂi.pa.i.ju] or [ʈ͡ʂi.pa.ju] 'exit-IND-1-D' are found on the surface, while Zúñiga's omits the first possibility altogether.

For Smeets (2008: 181, 366) and – based on her work – for Adelaar & Muysken (2004: 523) as well, the distribution of vowels and glides is simplified underlyingly by stating that the indicative-marker is always the glide [-j] (⟨-y⟩). When it is preceded by a consonant and followed by either a consonant or a word boundary, the epenthetic vowel [ɨ] is inserted. This is relevant in the second and third person in particular (see Table 3.19). The forms for the 1D and 1P have a syllable less in consonant-final roots. In the 1D, the glide vowel-vowel succession is resolved by eliminating the first person marker (-i) and adding an epenthetic [ɨ] when [j] is preceded by a consonant (/kon-j-i-u/ > [ko.nɨ.ju]). In the 1P there are no changes to the underlying form (/kon-j-i-ɲ/ > [kon.jiɲ]), as the homorganic glide-vowel sequence appears to be a valid onset-nucleus combination.

Table 3.19: Indicative marking for *kon-* 'enter' in Smeets (2008: 27, 181, 366)

	SINGULAR	DUAL	PLURAL
1st	[kon-ɨn]	[kon-ɨju]	[kon-jiɲ]
2nd	[kon-ɨjmi]	[kon-ɨjmu]	[konɨjmɨn]
3rd	[kon-ɨj] ~ [kon-ij]	[kon-ɨj=ŋu]	[kon-ɨj=ŋɨn]

Evidently, the contrast between the acceptability of 1P [kon.jiɲ] but the rejection

of surface 1D [kon.ji.u] (or perhaps or [kon.jiw]) seems peculiar at the very least and is, most likely, an artefact of the insistence on an underlying glide. The fact that Smeets does mention the alternation of – purportedly epenthetic – [ɨ] and [i] in the third person (2008: 27) makes it more plausible that in place of a mandatory glide as marker of the indicative, there could be a high, front sonorant underspecified for syllabicity marking the indicative, the first person and the singular (cf. Table 3.18).

Finally, Smeets finds a key alternation in her data as regards final vowel-glide sequences. She claims that where the 'IND-3S' focal person marker, *-ij*, follows the marker of the satellite 3rd person in direct constructions, *-fi*, there is alternation in the presence of a word-final homorganic glide.

(3.10) The *-fij* ∼ *-fi* alternation, according to Smeets (2008: 52-3):

fej-pi-fi-j *vs.* *fej-pi-fi-∅*
this-say-3.DIR-IND.3S
'he told him'

The constraint banning homorganic, tautosyllabic vowel-glide sequences which Salas explicitly suggests (2006: 104), is clearly not considered universally applicable in the case of Smeets's grammar, which accepts forms of the type *ko.n-i-j* 'enter-IND-3' and *fej.-pi.-fi-j* 'this-say-3.DIR-IND-3S'.

The only explicit analyses of the [i∼j∼∅] alternation are given by Grimes (1985: 155, fn.9) and Rivano (1990). For the first author, 'any vowel that is word-final or is not contiguous to a consonant disappears if it is contiguous to an identical vowel in all but the most careful speech, unless the earlier of the two identical vowels is at the end of a stem'(155). Importantly, this is only exemplified for what he considers to be underlying [i]. He also claims that there is a process of glide-formation (again, only exemplified by [i], by which 'any high vowel /i u ɨ/ that is preceded by another vowel

and followed either by a single consonant that is not final in the word, or by another vowel, surfaces as the corresponding semivowel /j w ɰ/'(*ibid*).

(3.11) Contiguous vowel deletion (VD) and semi-vocalisation (sV) (Grimes 1985: 155, fn.9)

/pe-mu-i-i-u/	→	*pemuiu*	→	*[pemuju]*
see-INV.2SP-IND-1-D		VD		sV
'you$_{\text{S-D-P}}$ look at us$_{\text{D}}$'				

In the same footnote, Grimes mentions personal communication with Adalberto Salas, in which he discusses the issue of vowel-glide sequences. Salas seems to claim that when attempting to write the language, native Mapudungun speakers are happy to place a glide between vowels but tend to hesitate as regards placing a glide after a vowel where it would occupy the coda position (word finally and before a consonant).

More in depth is the analysis given by Rivano, who attempts an ordered-rules analysis of the [i∼j∼∅] alternation. His unstated assumption is that the underlying form of the high-front sonorant is syllabic, which may be realised as a glide. There is also an independent process of glide insertion which breaks up identical vowel sequences. The crucial rules are given in 3.13, 3.12, 3.14 and 3.15 in the relevant order and with examples.

(3.12) Glide formation I – GF-I (Rivano 1990):

$$\begin{bmatrix} +\text{high} \\ -\text{back} \end{bmatrix} \longrightarrow \begin{bmatrix} -\text{syll} \end{bmatrix} / \underline{\quad} \begin{bmatrix} +\text{high} \\ +\text{back} \end{bmatrix}$$

a. *leli-i-u* → *leliju*
look-IND.1-D GF-I
'if/when we both looked'

b. *kon-l-i-u* → *konlju*
enter-SUBJ-1-D GI-I
'if/when we both enter'

(3.13) Vowel deletion – VD (Rivano 1990):

$$\begin{bmatrix} +\text{high} \\ -\text{back} \end{bmatrix} \longrightarrow \emptyset \; / \begin{bmatrix} +\text{high} \\ -\text{back} \end{bmatrix} \_\_\_\_$$

a. */laŋɨm-fi-i/* → *[laŋɨm-fi]*
die-CAUSE-DIR.3SP-IND.3 VD
's/he/they killed him/her/them'

b. *kon-i-i-ɲ* → *koniɲ*
enter-IND-3-P VD
'they entered'

(3.14) Glide formation II – GF-II (Rivano 1990):

$$\begin{bmatrix} +\text{high} \end{bmatrix} \longrightarrow \begin{bmatrix} -\text{syll} \end{bmatrix} / \begin{bmatrix} +\text{syll} \end{bmatrix} \_\_\_\_$$

a. *la-i* → *laj*
die-IND.3 GF-II
's/he died'

b. *eimi* → *ejmi*
PRON.2.S GF-II
'you$_s$'

(3.15) Glide Insertion – GI (Rivano 1990):

$$\emptyset \longrightarrow \begin{bmatrix} -\text{syll} \\ +\text{high} \\ \alpha\text{back} \end{bmatrix} / \begin{bmatrix} +\text{syll} \\ \alpha\text{back} \end{bmatrix} \_\_\_\_ \begin{bmatrix} +\text{syll} \\ \alpha\text{back} \end{bmatrix}$$

a. *ʈʂipa-a-i* → *ʈʂipajai*
exit-FUTURE-IND.3 GI
's/he will leave'

b. *pu-u-n* → *puwun*
here-come-IND.1S GI
'I come here'

These rules, insofar as they do not refer to syllabic structure directly, seem extremely *ad-hoc* (in particular, the fact that there is a special glide formation rule for [iu] sequences). Note that the forms given by Rivano are based on Echeverría (1964); Echeverría & Contreras (1965); Salas (1976, 1978a) and not on original data, so a number of forms differ from those given by Zúñiga (e.g. *konliju* vs. *konlju*; *konijiñ* vs. *koniñ*) and Smeets (especially with regards to final homorganic glides). This said, the key point that Rivano's analysis contributes to our discussion is that at some point of the representation, the native speaker must be able to access a single, invariant morpheme for mood, person and number. This is crucial as these processes may or may not interact with stress assignment.

Evidently, the data provided by contemporary accounts for glide-vowel sequences in Slots 2, 3 and 4 is not clear-cut. Although some degree of dialectal variation may account for all these conflicting factors, it is also likely that there are idiolectal and speech-rate factors that play into the actual realisation of the homorganic sequences, as well as some interference from the researchers' own approaches to the data.

In the new data presented here, the surface realisation of supposed underlying distinctions between vowel and vowel-glide sequences is unclear. No obvious phonetic difference was found between the presumed vowel-final forms of the indicative second person singular marking (/*-imi*/) and those of the presumed glide-final indicative third person marking (/*-ij*/).[19]

As is common enough, the surface segmental acoustics may fail to give a view into the representational level for the structure of the syllable (i.e. closed vs. open), while the suprasegmental patterns may well succeed in doing so. We find then, that speakers seem to alternate (on a case-to-case basis, not a speaker-to-speaker one) between stressing the final and penultimate syllables. It will be our claim that, in cases where it is underlyingly predicted (as per Table 3.18), the glide is part of the stress assignment algorithm, but that other aspects of the system (in particular, the facts relating to stem stress, cf. §4.3.1.4) determine whether the syllable it belongs to receives stress.

Non-finite verbal suffixes: *-(ɨ)n* (-INF), *-el* (-NOM) and *-lu* (-SVN) Although the focus here is predominantly on the finite forms of the verb, examples often include these three suffixes.

The *-(ɨ)n* is akin to the present participle of English, creating verbal nouns, adjectives and adverbs (Zúñiga 2006b: 141-3, cf. 3.16a-c). It is also the form that most closely resembles an infinitive (we gloss it as -INF, cf. 3.16d).

[19]In a fully articulated [ij] sequence, the mark of the presence of the glide is usually a gradual rise in F1, alongside a drop in the second and third formants. Either due to the quality of our recorded material or the word-final position of all the examined sequences (making these sequences slightly hypoarticulated), no consistent cues of this type were found. The fact that data for verbs was gathered in context does not allow for a rigorous measure of duration comparing the presumed [i] and [ij] final words as minute pauses or hesitations could throw off the measurements. Furthermore, final lengthening, which seems very common in the language (see §3.2.1.2), may neutralize this distinction.

(3.16) Functions of non-finite marker *-(ɨ)n* (-INF):

a. *kim-ŋe-ke-j* *ɲi* *weɲe-fe-ŋe-**n*** *kiɲe* *tʃe*
know-PASS-HABIT-IND.3S POS steal-AGENT-be-INF one person
'it is known when a person is a robber' (Zúñiga 2006b: 142)

b. *ʈʂana-**n*** *foje*
smash-INF winter's.bark
'mashed winter's bark' (a poultice) (Salas 2006: 179)

c. *Lef-kɨle-**n*** *amu-tu-j* *tʃi* *θomo* *ɲi* *ruka* *mew.*
run-ASP-INF go-REST-IND.3S the woman POS house POST
'The woman ran quickly back to her house' (Zúñiga 2006b: 142)

d. *pɨʈʂem-tu-**n*** *kɨme-la-j*
tobacco-VB-INF good-NEG-IND.3S
'smoking is not good' (Smeets 2008: 192)

Non-finite forms with *-el* and *-lu* function predominantly as the verbal element of subordinate clauses. In the case of *-el* it functions as a regular predicate in a subordinate clause, while in the case of *-lu* it is used as a subordinate clause marking the subject. We mark the forms according to Smeets's glosses: *-el* is marked as a nominaliser (-NOM), and *-lu* is marked as a subjective verbal nominaliser (-SVN).

(3.17) Functions of non-finite markers *-el* ('-NOM') and *-lu* ('-SVN'):

a. *fali-j* *ta=m-ɨn* *keʎu-**el**.* (Smeets 2008: 201)
be.worth-IND.3S DET=2-P help-NOM
'it was worth while that you$_P$ helped'

b. *tʃi* *wiʈʂan* *wija* *aku-**lu*** *aɭ̈ɨn* *nɨtram* *elu-e-n-ew.*
the visitor yesterday arrive-SVN much news give-INV-IND.1S-3SP
'the visitor who arrived yesterday gave me much news'(Augusta 1903: 186)

Slot 6: DIRECT (-DIR) and INVERSE (-INV) marking This slot is specific to transitive verbs, taking either the *-e* or *-fi* morphemes. Following Zúñiga (2006b: 114-18)

both forms usually mark the SP as third person.[20] *-fi* is used for direct constructions, where the FP is the agent. *-e* is used in inverse constructions (coordinated with Slot 1 *-ew*, which we gloss as 3SP) where the SP is the agent.

(3.18) Direct and inverse construction markers for a 3rd person SP:

a. *leli-**fi**-n*
see-3SP.DIR-IND.1S
'I see him/her/it'

b. *leli-**e**-n-ew*
look-INV-IND.1S-3SP
'Me, s/he/they see(s)'

Slot 8: *-fu*, marking BREAKING IMPLICATURE (-BI) **or** ANTIPASSIVE The single morpheme *-fu* is assigned to this slot. The actual semantic or pragmatic content of the form, however, is still debated in the literature. In the missionary grammars, it is considered a tense marker, modelled on different forms of the preterite (past or imperfective) in Latin or Spanish. More recent work, however, distinguishes only the future and non-future tenses in Mapudungun, assigning the morpheme a modal, aspectual or metapragmatic function (cf. Hasler 2009: for a detailed account). Croese (1984) and Harmelink (1988) consider it a marker of 'counter-expectation', that is, as a device for showing that a certain state of affairs does not have the result it was made out to have. Smeets (2008: 230-5) refers to the same type of phenomenon, where *-fu* as an 'impeditive' suffix, which is fundamentally the 'unsuccessful realisation of an event' (230). We are told there is always a 'but' in its use, either explicit or implied.

[20]Inverse paradigms are less regular than direct ones. The third person SP is marked by *-ew*, while *-mu* marks the second and *-wijɨn* is used for practically all forms of the first person (Zúñiga cf. 2006b: 146, Salas 1978b).

(3.19) The *-fu* suffix as a marker of 'counter-expectation' or 'impeditive'

a. *waria meu nie-ke-**fu**-n kiɲe ruka* (Croese 1985: 68)
city post HAVE-HABIT-BI-IND.1S one house
'I used to have a house in the city'

b. *iɲtʃe reje-**fu**-n ta-ɲi mɨle-a-l tɨfachi ruka mew*
I want.badly-BI-IND.1S my be-FUT-VN this house POST
(Smeets 2008: 231)
'I wanted to live in this house so badly' (but it never came to anything)

Based on discourse pragmatics, Golluscio (2000) goes further, claiming that the suffix (given as *-fɨ*, following Argentinian tradition) is 'a metapragmatic operator which acts to alert to, interrupt, or rupture conventional implicature in speech', a position followed by Zúñiga (2006b: 133-5), the morpheme being designated as a marker of 'broken implicature' (BI in the glosses).

(3.20) *-fu* (*-fɨ*) as a marker of 'broken implicature' (Golluscio 2000: 246)

a. *mawtu-i ta ti pɨchi wentru*
sleep-IND.1S the little boy
'the little boy slept'

b. *mawtu-**fɨ**-i ta ti pichi wentru*
sleep-BI-IND.1S the little boy
'the little boy [wanted] to sleep [but he couldn't]'

Another possible analysis is presented by Hasler (2009) and Soto & Hasler (2010) whereby the same kind of construction is considered to be an 'anti-perfective', that is, a mirror image of 'perfective' aspect. In the anti-perfective, a current state of affairs described by the verb would be explicitly de-linked from the moment of speech, as much as in the perfect it is explicitly linked to it. This type of analysis is an attempt to rope the suffix into a broader tense-mood-aspect typology (such as that presented

by Dik 1997), and is compatible with Salas's (2006: 130-1) claim that *-fu* represents a marker of 'non-effectiveness at the moment of speech'.

Differences between the evidence for these analyses are subtle and their result is ultimately inconsequential to our goals. For practical purposes, we gloss the morpheme as 'broken implicature' (BI), as it appears to be most widely used.

Slot 9: *-a* as marker of FUTURE (-FUT) This is the only slot that is dedicated to tense marking, being occupied by the future marker *-a* (realised as *-ja* after [a]). Although Smeets (2008: 235-43) designates the suffix as having the meaning 'non-realized' (i.e. not a simple future certain, but an array of conditional and deontic constructions), the vast majority of contemporary grammars simply opposes *-a* to unmarked, non-future forms. For our purposes, we assume this dichotomy is uncomplicated, especially as in most cases (even in Smeet's examples) *-a* can be translated by the English auxiliary *will*.

(3.21) The suffix *-a* as future marker:

a. *wule* *apu-**a**-j* *pu* *wiʈʂan* (Hernández et al. 2006: 94)
tomorrow arrive-FUT-IND.3S PLUR guest
'the guests will arrive tomorrow'

b. *θuŋu-la-**ja**-fi-j-m-i* (Smeets 2008: 237)
speak-NEG-FUT-3SP.DIR-IND-2-S
'you must not speak with him'; 'you WILL not speak with him'

Slot 10: NEGATIVE (-NEG) **marking** Polarity morphology occupies this slot (in particular, negation), encompassing the suffixes *-la, -ki*, and *-no*. We will focus on the most common morpheme, *-la*, used for the indicative mood.[21]

[21]The morpheme *-no* (alternating with *-nu*) is used with the subjunctive mood as well as with non-finite formations. The *-ki* form is used with the imperative forms, sometimes alongside *-no* as well.

(3.22) Negation marking (*-la*) in the indicative mood:

a. *t̪s̪ipa-**la**-j-m-i*
exit-NEG-IND-2-S
'yo don't exit'

Slot 13: PROXIMITY (-PX) **and** VALIDITY The suffix *-pe* is labeled by Smeets (2008: 247-51) as a 'proximity' (PX) marker, meaning that the event has occurred recently and in proximity to the subject. Golluscio (2000) gives a broader interpretation of *-pe* as an evidential as well as the mentioned indexical meaning: 'the occurrence of *-pe* creates both a pragmatic relationship of 'proximity' between the situation referred to by the verb and the moment of speech and, at the same time, a pragmatic inference of 'validity' of the facts spoken about" (252).

(3.23) The suffix *-pe* as 'proximity' and 'validity' marker:

a. *iɲtʃiu kwiθa-kuʎiɲ-**pe**-j-u* (Smeets 2008: 148)
we$_{D}$ tend-cattle-PX-IND-1-D
'we both have been tending cattle'

b. *Wiya ŋa mawɨn̪-**pe**-j* (Zúñiga 2006b: 137)
yesterday affirmative rain-PX-IND.3S
'it is certain that it did rain yesterday'

Slot 14: the HABITUAL (-HABIT) **marker** *-ke* Although Smeets (2008: 251) designates the suffix *-ke* as a 'constant feature of the subject' marker. The distinction between this and a habitual marker is minimal, the latter defining a state of affairs affecting the subject (more explicitly, the agent) in a permanent or recurring manner. The possibility of this being an actual feature of the subject is questionable as seems to be the case in one of Smeet's own examples (cf. 3.24b).

(3.24) The habitual marker *-ke*:

a. *ŋoli-**ke**-j* (Salas 2006: 139)
get.drunk-HABIT-IND.3S
's/he always gets drunk'

b. *tɨfa mew pe-**ke**-e-y-u kujfí* (Smeets 2008: 252)
this POST see-HABIT-INV-IND.1-2 formerly
'I used to meet you here'

Slot 16: REPETITIVE/RESTORATIVE (-REST) *-tu* **and** CONTINUATIVE (-CONT) *-ka* This slot allows for two suffixes: *-tu* and *-ka*, the first of which is termed the 'repetitive-restorative' (Smeets 2008: 254) or 'repetitive-inversive' (Salas 2006: 145), and the second, the 'continuative' (Zúñiga 2006b: 162) or 'iterative' (Smeets 2008: 256).

(3.25) The 'repetitive-restorative' suffix *-tu*:

a. *aku-n vs. aku-**tu**-n* (Aug: 5)
come-INF come-REST-INF
'to come' vs. 'to come back'

b. *nel-ɨm-**tu**-fi-n* (Smeets 2008: 254)
become.loose-CAUSE-REST-3SP.DIR-IND.1S
'I set him free again' 'I restored his freedom to him'

(3.26) The 'continuative' suffix *-ka*:

a. *mɨle-**ka**-j taŋi ruka mew.* (Zúñiga 2006b: 162)
be-CONT-IND.3 POSS.3 house POST
's/he is still at his house'

b. *pitʃi-**ka**-j* (Smeets 2008: 256)
small-CONT-IND.3S
's/he is still small (for his age)'

Slot 17 LOCATIVE (-CIS; -TRLOC) **suffixes** *-pa* **and** *-pu* Suffixes *-pa* 'CISLOCATIVE' and *-pu* 'TRANSLOCATIVE' (for the terminology referring to locative suffixes, we follow Zúñiga 2006b: 169-170) refer to events occurring near and far, respectively, from the speaker at the moment of speaking.

(3.27) Cislocative (*-pa*) and translocative (*-pu*) suffixes :

a. *Juan mew mɨle-**pa**-j ti wiŋka.* (Catrileo 2005: 3)
Juan POST be-CIS-IND.3 the foreigner
'the foreigner is here at Juan's house'

b. *fejpi-**pu**-a-fi-m-i...* (Pascual Coña in Zúñiga 2006b: 168)
this.say-TRLOC-FUT-3SP.DIR.IND-2-S
'you will tell him this, when you are there...'

Slot 20: the ANDATIVE (-AND) *-me* The andative suffix *-me* implies movement away or back from the location at the moment of speech (Zúñiga 2006b: 170). Salas (2006: 142) further states that the constructions it is used in have the further implication of finality or purpose.

(3.28) The andative suffix *-me*:

a. *kɨdaw-i-m-i vs. kɨdaw-**me**-j-m-i* (Salas 2006: 142)
work-IND-2-S work-ANDATIVE-IND-2-S
'you worked' vs. 'you went there in order to work'

b. *ʦaf-**me**-a-e-n estasion mew* (Smeets 2008: 161)
meet-ANDATIVE-FUT-2DIR-IND.1S station POST
'go and meet me at the station'

Slot 23: the PASSIVE (-PASS) **suffix** *-ŋe* This slot contains, among other valency-reducing forms, the passive suffix *-ŋe*. The peculiarity of this kind of construction in Mapudungun is that the missing 3rd person argument – the agent – cannot be stated

at all in the clause, making the construction an 'agentless' one (Zúñiga 2000). Clearly, passivisation is only available for direct constructions, the inverse forms being a very near way of expressing a passive without omitting the agentive argument. For more details on the issue of passive formations and the Mapudungun inverse system see Baker (2003).[22]

(3.29) The passive suffix *-ŋe* (a) vs. inverse argument marking (b)(Baker 2003: 9)

a. *keʎu-**ŋe**-j.*
help-PASS-IND.3S
'He was helped; someone helped him.'

b. *keʎu-**e**-j-ew* *ɲi* *pu* *wenɨj.*
help-INV-IND.3S-3S POSS PLUR friend
'He was helped by his friends, His friends helped him.'

Slots 26 and 27: APPLICATIVES (-APPL) *-(ɨɲ)ma*, **and** *-(l)el* In a broad sense, both these suffixes can be considered applicatives, adding an argument to the verb they attach to. In Smeets's (2008) account, *-(ɨɲ)ma* simply designates the presence of an indirect object in the construction, while *-(l)el* is explicitly singled out as a beneficiary in a ditransitive construction (cf. 3.30b). Elsewhere (Augusta 1903: 61, Zúñiga 2010), *-(ɨɲ)ma* is taken to represent a malefactive suffix, built in opposition to *-(l)el* in ditransitive constructions (cf.3.30a).[23] When this opposition is not available, *-(ɨɲ)ma* may also indicate the affectedness of the SP (Zúñiga 2010), a claim furthered by Golluscio (2010: 737), who tells us it is a marker of an 'affected human recipient (non-agent) argument who is the external possessor of the theme', without necessarily implying the addition of a new argument (as in 3.30c).

[22]For an alternative account of the function and semantics of the suffix see Loncón Antileo (2007).

[23]This is rejected by Harmelink (1996), who claims that the forms are neutral (cf. p. 231 *wɨlel-ɨɲma-e-n-mew taɲi foṯɨm* 'S/he hit my son.' vs. *keʎu-ɲma-e-i-mi-mew tami ɲawe* 'S/he helped your daughter.'

(3.30) Applicative suffixes *-(ɨɲ)ma* and *-(l)el*

a. *femŋetʃi* *weɲe-nie-**ɲma**-rke-fi-i-ŋ-ɨn* *ɲi* *mapu* *pu*
thus steal-have-APPL-3-REP-DIR.3SP-IND-3-P POSS-3 land PLUR
maputʃe (Smeets 2008: 276)
Mapuche
'In that way, I heard, they kept robbing the Mapuche of their land.'

b. *kintu-**lel**-e-n* *mamɨʎ.* (Golluscio 2010: 737)
look.for-APPL-INV.2S.SP-IND.1S wood
'you$_s$ searched for (fire)wood for me.'

c. *kintu-**ɲma**-e-n-ew* *mamɨʎ* (Golluscio 2010: 738)
look.for-APPL-INV-IND.1S-3SP wood
'He looked for my wood' (the wood is mine, the beneficiary is undefined)'

Crucially for our purposes, Zúñiga (2006b, 2010) claims that a distinction may be drawn between two different suffixes, designated as *-(ɨ)ɲma* and *-(ɲ)ma*. While both introduce a new argument, the first is used in transitive verbs, introducing a non-agentive SP argument (as in 3.30a), the second is used for intransitive forms, introducing a new 'affected' FP (as in 3.30c). The syntactic distinction is mirrored by differences in the allomorphy of the suffix.

(3.31) Allomorphs of *-(ɨ)ɲma* -APPLICATIVE' (a) and *-(ɲ)ma* '-TRANSITIVISER (b)(Zúñiga 2010: 211):

a. Applying to transitives, leaving FP intact and introducing new non-agentive SP:
-ɲma = after vowels
-ma = after [ɯ], liquids, nasals and some fricatives
-ɨɲma = elsewhere

b. Applying to intransitives, demoting original FP and introducing new one:
*-ɲ*ma = after vowels
-ma = elsewhere

This interpretation is supported by the fact that Smeets finds a distinction between the *-(ɨ)ɲma* 'indirect object' marker and a *-(ɲ)ma* suffix in Slot 35 which carries the meaning 'experience' (2008: 301). Her reading is that *-(ɲ)ma* 'indicates that the subject of an intransitive verb experiences the process or event denoted by the verb'. Clearly, the 'transitive' interpretation given by Zúñiga entails placing the affected experiencer in the FP position, while preserving a separate argument in a non-agentive SP role, as opposed to Smeets's reading, which assumes that the basic function of the suffix is not to add an argument, the affected argument being the same as the subject. In her examples, however, the possibility of interpreting *-(ɲ)ma* verbs as transitive is always present (3.32a)[24], although the two arguments may be coreferential.

(3.32) The 'experience' or 'transitiviser' suffix *-(ɲ)ma* (Smeets 2008: 301-3)

a. *poj-**ma**-j* *vs.* *poj-ɨj*
boil-TR-IND.3S boil-IND.3S
'he got a boil' vs. 'a boil appeared'

b. *anɨ-**ɲma**-e-j-ew* *wekufɨ*
sit.down-TR-INV-IND.1S-3SP demon
'he was possessed by a demon'

The position of this second suffix being much closer to the verb-root is claimed to allow it to become part of the verb-stem, or to create a new lexical entry such as the case of *wiṭsan-ma-n* 'visitor-TR-INF = to receive a visitor' (Smeets 2008: 303), a point which we will consider crucial in our analysis of Mapudungun verbal stems.

Slot 28: PROGRESSIVE (PROG) **marker** *-(kɨ)le*: The progressive aspect marker indicates an action that is in process, for verbs with an atelic aktionsart, though it may also indicate a 'resultative' in the case of telic verbs (Zúñiga cf. 2006b: 160-1, Smeets 2008: 281). The form is realised as *-le* after vowels, and as *-kɨle* elsewhere.

[24]Note here that the affectee in the *-(ɲ)ma* form is distinct from the subject of the non-*(ɲ)ma* form.

(3.33) Progressive and resultitative aspect marked by *-(kɨ)le* ('-PROG'):

a. *kon-**kɨle**-j* (Smeets 2008: 281)
enter-PROG-IND.3S
's/he is coming in'

b. *kɨrɨ-**le**-j* (Zúñiga 2006b: 161)
black-PROG-IND.3S
'it went black'

Slot 34: CAUSATIVES *-(ɨ)m* **and** *-(ɨ)l* It is generally agreed that *-ɨm* is no longer a productive suffix, attaching to no more than 35 verbs (according to Smeets 2008: 299), some of which display non-systematic phonological alternations in the suffixed forms (as opposed to the non-suffixed ones – cf. the last three items in Table 3.20 [25]).

Table 3.20: *-ɨm*-suffixed verbs, meaning and alternations (Smeets 2008: 299):

ROOT	MEANING	ROOT-CAUSE	MEANING
ɲam-	'to get lost, disappear'	*ɲam-ɨm*	'to lose'
are-	'to become hot'	*are-m*	'to heat'
trem-	'to grow'	*ʈ̪sem-ɨm*	'to raise'
la-	'to die'	*laŋ-ɨm*	'to kill'
af-	'to end'(INTR.)	*ap-ɨm*	'to finish'(TR.)
ʎeuɻ-	'to come up'	*ʎeuɻ-ɨm* ∼ *ʎek-ɨm*	'to bring up'

Both suffixes add an external agent to the event, with *-(ɨ)m* attaching exclusively to intransitives (3.34 a vs. b), while *-(ɨ)l* may attach to both intransitive (3.34 c vs. d) and labile (3.34 e vs. f) verbs of both native and borrowed stock. For Golluscio (2007) the two suffixes are further distinguished by the semantics of the construction, in particular with reference to the parameters of ANIMACY and CONTROL of the CAUSEE argument (cf. Golluscio 2007). On the one hand, *-(ɨ)m* is found with inanimate and low control causees (occupying a more typically patientive role), in what she considers

[25] Zúñiga (to appear) gives a few reasonable indications as to the possible sound changes that generated these alternations.

unaccusative verbs (in the underived form) with a telic, change of state semantics. In the case of the *-(ɨ)l* suffixed words,[26] the causee is by and large animate and very often human. Although causativisation of high agency verbs always occurs via *el-*, the suffix does attach to other, non-agentive arguments. The crucial distinction between the two forms has to do primarily with the animacy of the causee, rather than with the semantics of the verb.

(3.34) Causatives *-(ɨ)m* and *-(ɨ)l* (Golluscio 2007: 210-11)

a. *waθkɨ-i ta ko.*
boil-IND.3 DET water
'the water boils'

b. *Juan ta pɨti ta waθkɨ-**ɨm**-i ta ko.*
Juan DET still DET boil-cause-ind.3 DET water
'Juan is boiling the water'

c. *aje-i ta maɻen*
laugh-ind.3 DET girl
'The girl laughed'

d. *ta ɲi tʃaw aje-**l**-e-j-ew ta maɻen*
the 3.psr father laugh-cause-inv-ind.3-3sp the girl
'the girl's father made her laugh'

e. *waʈʂo-i mamɨʎ Juan*
break-ind.3 stick Juan
'Juan broke a stick'

f. *Juan waʈʂo-**l**-fi-i mamɨʎ Pedro*
Juan break-cause-dir.3sp-ind.3 wood Pedro
'Juan had Pedro break a stick'

Slot 35: TRANSITIVISER (-TR) **suffix** *-(ɲ)ma* Finally, slot 35 is the locus of the purportedly distinct partial homophone of the applicative *-(ɨɲ)ma*, the 'experience', or

[26]Golluscio (2010) claims that the *-(ɨ)l* suffix alternates with the independent verb root *el-* 'put [in this world], put in order, create'– p.224.

in the terms of Zúñiga 2010 the 'transitiviser' suffix *-ɲma*. Further details and examples are given in the section on *-(ɨɲ)ma* (3.4.1.1, Slot 26).

Summing up: A sampling of the wide array of verbal morphology available to Mapudungun speakers has been given here, noting the fair amount of phonological alternation that surfaces in each individual morpheme. The mood, person and number suffixes constitute what Salas (2006) terms an 'obligatory finite verb inflection', which is crucial in determining the weight of the final syllable. Finite Mapudungun verbs may end in the vowels [i] or [u] (very rarely [e] - in the -IMP-2S), the nasal [n] (palatalised to [ɲ] after high, front [i]), or the glides [j] and [w], the contrast between these nucleus and coda elements being critical for the application of potential weight-sensitive stress rules.

Critical to the closed/open alternation in the final syllable of finite verbs is the alternation between surface [i∼j∼∅] as a reflex of the singular marker, which we presume to be underlyingly underspecified for syllabicity. Although clearly syllabic after consonants and non-syllabic after non-homorganic vowels, in the case where if follows a front high vowel, it is often claimed that deletion occurs. Although this may well be the case, the data we find in the following sections will show that considering that it surfaces as a glide at a point in the derivation before stress assignment seems to clarify much of the patterns.

Finally, it was noted that in close adjacency with the verbal root, there are at least a couple of valency-changing suffixes (in particular the causative *-(ɲ)ma* and the transitiviser *-(ɨ)m*) that appear to be closely attached to it both phonologically and semantically. This will be of interest when examining the position of stress at the left edge of the prosodic word, particularly as regards the notion of the stem in the language.

3.4.1.2 New data on final stress and suffix alternation

The 282 individual verb-tokens examined in this section were gathered in the general knowledge questions, sentence-translation and picture-based questions tasks of our fieldwork (see §3.1 and Appendix A). Tokens belong to six different speakers and encompass 53 different roots with varying morpho-phonological structures. No fine-grained phonetic analysis was undertaken, but all intuitions regarding the position of stress were checked with our main informant, Sergio Catricura. All forms where right-edge stress was clearly perceptible were preserved. In the few cases where stress was imperceptible or ambiguous, tokens were not included.

As already outlined above (p. 117ff.), indicative third person singular marking (underlyingly /-I-∅-I/) presents important difficulties for discerning segmental and supra-segmental targets for stress assignment.[27] For this reason, we begin our analysis with the unambiguous forms, leaving out all indicative third person verbs, except those where the mood-person-number marking is preceded by a vowel that is not [i] (or [e], which regularly assimilates), in which case the -IND-3-S marking is uncontroversially [-j].

Verbs with unambiguous final segments: The data is summarised in Table 3.21, and examples are given in 3.35.

[27] We refer to the singular form of the third indicative here, where the proposed underlying form clearly has two high, front vocoids. The underlying form of the dual and plural third singular, however, are likely to be identical, as are all the forms of the third person in the subjunctive and imperative (minus the pronominal clitic, cf. 3.17).

Table 3.21: Right-edge stress in verbs with unambiguous final segments

Syllable structure	Final stress	Penult stress	Totals
Final closed	90	7	97
Final open	9	45	54
Totals	99	52	151

(3.35) Examples for verbs with unambiguous final segments:

a. *kon.-pu.-tu.-á-j*
enter-CIS-RESTOR-FUT-IND.3
's/he will go back into x'

b. *ʈʂi.pa.-ke.-lá-n*
exit-HABIT-NEG-IND.1S
'I don't usually go out'

c. *i.ʈʂif.-tu.ku.-lá-j.-m-i*
throw-put.in-NEG-IND-2-S
'you don't throw in'

d. *ko.n-í.-j-u*
enter-IND-1-D
'you (two) enter'

Words ending in the second person plural marker [-m-n] were considered to have an epenthetic vowel ([ɨ]or [ə]) between the two nasals. This vowel was not taken into account in stress assignment, so forms such as (3.36) were taken to be stress-final.

(3.36) Stress in verbs with final-syllable [ɨ ∼ ə] epenthesis:

a. *i.ʈʂif.-tu.ku.-lá-j.-m-in*
throw-put.in-NEG-IND-2-P
'The two of you do not throw x into'

As it stands, the data for final closed syllables follows the prediction made by most Mapudungun specific studies – penultimate mora stress – in almost 93% of cases, while

the data for final open syllables bears out these predictions in exactly 80% of cases. The details of what appear to be exceptions to the nominal stress-assignment system are given in Table 3.22.

Table 3.22: Unexpected stress in verbs with unambiguous final segments

Final closed with no stress		Final open with stress	
ʈʂi.pá.-la-j 'exit-NEG-IND.3'	5	*ʈʂipá-ke-la-j-m-í* 'exit-HABIT-NEG-IND-2-S'	1
pi.-ŋé.-fu-j 'say-PASS-RI-IND.3'	1	*ʈʂipá-la-j-m-í* 'exit-NEG-IND-2-S'	1
ɨ.ʈʂíf.-tu.ku.-la.-já.-j-i-ɲ 'throw-put.in-NEG-FUT-IND-1-P'	1	*ɨ.ʈʂíf.-tu.ku-ke.-la-j.-m-í* 'throw-put.in-HABIT-NEG-IND-2-S'	1
—		*ɨ.ʈʂif.-la.-já.-fi.-m-í* 'throw-NEG-FUT-3DIR.IND-2-S'	1
—		*kón.-pu.-tu-j.-m-ú* 'enter-TRANSLOC-RESTOR-IND-3-S'	1
—		*kɨ.pá.-l-e.le.-j-ú* 'come-CAUSE-BENEF-IND-1-D'	1
—		*le.lí.-a.-fi.-j-ú* 'see-FUT-3DIR-IND.1-D'	1
—		*mɨ.lé.-we.-j-ú* 'be-PERSIST-IND.1-D'	1
—		*ʈʂi.pá.-ke.-la-j.-m-ú* 'exit-HABIT-NEG-IND-2-S'	1

For the 'final closed syllable with no stress' cases we note that the majority of verbs correspond to a single form *ʈʂi.pá.-la-j* 'exit-NEG-IND.3', as given by three different native speakers. This form does, however, surface with final stress (*ʈʂi.pa.-lá-j*) elsewhere, even in the usage of a single speaker. Interestingly enough, the root form, *ʈʂi.pá-*, is listed in Augusta's dictionary as having fixed stress on the root-final syllable (1916: 232-3).

In the case of the form *pi.-ŋé.-fu-j* there are reasons to be cautious. The passivising suffix *-ŋe*, in this case, may be lexicalised to some degree, as it is taken to mean very specifically 'be called' as in stating one's own name 'I'm called X'. More significantly,

the morpheme appears to be part of the category of stressed suffixes, as we will see in §3.57.

In the case of the form *i.ʈʂɨf.-tu.ku.-la.-já.-j-i-ɲ*, the pattern remains unexplained, unless we assume the speaker was emphasising the future morpheme *-a*, as having a deontic meaning (cf. 3.4.1.1).

(3.37) Unexpected stress as morpheme focusing (original data):

a.	*i.ʈʂɨ́f.-tu.ku.-la.-já.-j-i-ɲ*	*kurá*	*tufej*	*ʧi*	*léwfu*	*méw.*
	throw-put-NEG-FUT-IND-1-P	stone	this	the	river	psp
	'We WILL not throw stones in the river'					

For the 'final open syllable with stress' cases, there is likely to be a task-specific effect in the data. All the forms that present these inconsistencies belong to the translation-based section of the fieldwork (cf. Task E in §3.1, p. 76 and Appendix A), where subjects were asked to translate from Spanish several series of sentences which varied only in the person/number of the FP (or the subject in Spanish). It would be, therefore, unsurprising if a large number of these forms attracted contrastive stress to the varying morphology, which in all these cases was coextensive with the final syllable of the verb.

(3.38) Contrastive stress on final syllable in translation (Task E):

a.	*intʃe*	*i.ʈʂɨf-.tu.ku.-lán*	*kura*	*l̪afkén̪*	*mew.*	
	you	throw-ASP-NEG.IND-2-S	stone	lake	POST	
	'**I** do not throw stones into the lake'					
b.	*ejmi*	*i.ʈʂɨf-.tu.ku.-la-j.-m-í*	*kura*	*l̪afkén̪*	*mew.*	
	you	throw-ASP-NEG.IND-2-S	stone	lake	POST	
	'**you** do not throw stones into the lake'					

Overall, then, we may propose for the right edge of verbs with unambiguous final segments (where contrastive focus is not an issue), the stress-assignment system seems to favour the penultimate mora.

(3.39) Stress in verbs with unambiguous final syllables (penultimate mora):

- Stress a final closed syllable,
- otherwise, stress the penultimate syllable

Verbs with ambiguous final segments: This category encompasses cases where it is unclear whether a verb ends in a homorganic vowel-glide sequence, [ij], or a singleton vowel, [i]. Such forms are characteristic of the third person indicative, after either a consonant (C) or a homorganic vowel ([i]). Following the suffixes *-ke* (HABITUAL), *-ŋe* (PASSIVE), *-(ku)le* (PROGRESSIVE), and *-pe* (PROXIMITY/VALIDITY), as well as in [e]-final roots, assimilation of [e] to [i] is the norm. We therefore include these within the category of 'ambiguous' verbs.

(3.40) Example ambiguous final segment verbs (preceded by /C/, /i/ and /e/):[28]

a. */lef-I-∅-I/* > *[lefi(j)]*
run-IND-3-S
'he (she, it they) ran'

a. */elu-fi-I-∅-I/* > *[elufi(j)]*
give-INV.3SP-IND-3-S
'he (she, it, they) gave him (her, it, them) x'

b. */keʃu-ke-I-∅-I/* > *[keʃuki(j)]*
help-HABIT-IND-3-S
'he (she, it they) usually helped

Table 3.23 presents the data for stress in these ambiguous final segment verbs, subdivided by the nature of the immediately preceding segments.

In a full 72% of cases, stress is placed on the final syllable, as would be expected in the penultimate mora analysis, were it closed. This argues for the possibility of some

[28]Recall we use ⟨I⟩ to represent a proposed underlying high, front sonorant that is underspecified for syllabicity.

Table 3.23: Stress position in verbs with ambiguous final segments, by preceding segment

Preceded by	Final stress	Penult stress	Totals
All	91	38	129
Consonant	16	13	29
/i/	28	19	47
/e/	47	6	53

level of representation where there is a glide adding weight-by-position and, hence, attracting stress, as seems to be the case for nouns and verbs in the preceding section. A closer look at the details of this distribution, with an eye to the nature of the previous morpheme (cf. Table 3.24), shows that alternation is far more restricted than at first sight.

Table 3.24: Stress position in verbs with ambiguous final segments, by preceding segment and morpheme (only forms which may surface with penult stress included)

Preceded by		Final stress	Penult stress	Totals
Cons:	/–(ɨ)l/$_{\text{CAUSE}}$	5	10	15
Cons:	/-(ɨ)m/$_{\text{CAUSE}}$	6	3	9
/i/	/-fi/$_{\text{DIR.3SP}}$	28	18	46
/i/	/i/-final-ROOT	0	1	1
/e/	/-ke/$_{\text{HABIT}}$	15	6	21

Note that the largest number of cases where the final syllable lacks stress is found among verbs where the IND.3S marking is preceded by /i/. Furthermore, such numbers are made up almost exclusively by verbs with the suffix /-fi/,[29] claimed elsewhere – in stark contrast with our data – to be a stress-attracting suffix (cf. Salas 2006: 74, Zúñiga 2006b: 64 and 2007b: 3). In the cases where it is a consonant that precedes the IND.3S ending, all occurrences are of verbs with the causative suffixes *-ɨm* and *-ɨl*.

[29]The only exception here is the pronnunciation of the verb *léli-(j)* 'watch-IND.3S' by one speaker. The case is a rarity insofar as it corresponds neither to the left- or right-edge constraints proposed here.

Finally, as regards IND.3 endings preceded by /e/, the only real cases of non-final stress belong with the habitual suffix /-ke/.

The *-fi*+IND.3S cases, although predominantly placing stress on the final syllable (61%), show alternation with penultimate stress, both overall and in identical items (even for the same speaker).

(3.41) Stress alternation in *-fi*+IND.3 forms:

a.	*leli-fí(-j)*	∼	*lelí-fi(-j)*	watch-DIR.3-IND.3S
b.	*elu-fí(-j)*	∼	*elú-fi(-j)*	give-DIR.3-IND.3S
c.	*elú-ɲma-fí(-j)*	∼	*elu-ɲmá-fi(-j)*	give-APPL-DIR.3-IND.3S
d.	*pe-fí(-j)*	∼	*pé-fi(-j)*	say-DIR.3-IND.3S

The fact that it is generally assumed that IND.3S is zero-marked after /i/ –especially in the case where the vowel is not part of the root – explains the claims that *-fi* itself draws stress. In other words, if it is assumed that *-fi* is the final open syllable of a verb, its lack of stress is unsurprising, while the cases where it bears stress require an explanation. Based on numbers alone, it appears that this presupposition (i.e. there is no mark for the IND.3S before stress assignment), is inaccurate. Nevertheless, this does not explain the widespread alternation found in our data. It seems, rather, that the banning of final homorganic vowel-glide sequence conflicts with the need to preserve the IND.3S person markers. In this sense, analogy with other (non-homorganic) forms is likely to make the presence of the final glide more robust at some level of representation, preserving final stress in a number of cases.

Although it may be the case that a few *-fi*+IND.3S forms exhibit some degree of free-alternation as regards stress, the phenomenon is sensitive to particular contexts, especially in relation to left-edge stress. We note that in 14 out of the 18 cases, penultimate stress actually surfaces on the final syllable of a verb-root listed (in Augusta 1916) as having fixed (final) stress (*ruŋá-* 'dig', *θew.má-* 'build') or on a preceding

valency-changing suffix (*-(ɲ)ma*, *-(ɨ)m*, and *-(ɨ)l*), the verbaliser *-tu* or the proximity marker *-pe*.[30] This said, we will need to present the constraints on stress at the left edge (in §3.4.2 below) before giving a definitive account of these forms.

For the second-largest group, where the IND.3S marking is preceded by a consonant, some alternation in stress position is also found. In our data, the only forms that lack stress on the final syllable are preceded by the causatives *-(ɨ)l* and *-(ɨ)m*.

(3.42) Stress alternation in *-ɨl* and *-ɨm* +IND.3S forms:

a. *kɨpa-l-í(j)* ∼ *kɨpá-l-i(j)* 'come-CAUSE-IND.3S'

b. *l̪aŋ-ɨm-í(j)* ∼ *l̪aŋ-ɨ́m-i(j)* 'die-CAUSE-IND.3S'

In the *-(ɨ)l* cases, stress falls on the final syllable of the verb-roots, which Augusta (1916) considers inherently stressed. In the single (albeit nine times repeated) *-(ɨ)m*-suffixed form (*l̪aŋ-ɨ́m-i(j)* 'die-CAUSE-IND.3S'), stress is assigned to the suffix in a third of the cases. Stress in this root-suffix sequence may be conditioned by factors to do with stem-formation, suffix stress, and lexicalization, all issues we will discuss in the relevant section on root stress (§3.4.2).

Finally, the alternation of stress on the *-ke*+IND.3S-suffixed verbs is particularly illuminating, as in all cases where it is unstressed, main stress surfaces on the final syllable of roots reported by Augusta (1916) to have fixed stress (*mɨlé-* 'be', *t̪sipá-* 'exit', *θewmá-* 'build').

[30]The four remaining forms are all based on *elu-* 'give' and *leli-* 'watch', which, although not listed in Augusta (1916) as having fixed stress, show a robust tendency for fixed final stress in our data.

(3.43) Final (a-c) and penultimate (d-f) stress in /-ke/ +IND.3S forms:

a. *taku-kí(-j)* 'cover-HABIT-IND.3S'

b. *wef-kí(-j)* 'produce-HABIT-IND.3S'

c. *θewmá-ka-kí(-j)* 'make-CONT-HABIT-IND.3S'

d. *ʦipá-ki(-j)* 'exit-HABIT-IND.3S'

e. *mɨlé-ki(-j)* 'be-HABIT-IND.3S'

f. *θewmá-ki(-j)* 'make-HABIT-IND.3S'

Overall, then, in all three preceding environments from Table 3.23 ([C-], [i-], and [e-]), the vast majority of cases where stress is not final have particular lexical or morphological qualifiers that may interact with the predominant pattern (i.e penultimate mora stress). To this extent we may consider that the final glide, although present at a level of the representation before stress assignments, may alternate on the surface as a result of speech rate and style. Crucially, it is likely that when stress assignment rules place main stress on a different syllable, the word-final homorganic vowel-glide sequence may be simplified to become a single vowel. We shall reevaluate this claim after we have presented further data on the nature of left-edge stress (§3.4.2).

We have, however, provided a fair amount of data to further the claim that right-edge stress in Mapudungun has a strong tendency to fall on the penultimate mora of verbs. We turn, in the next section, to left-edge stress which may help clarify the exceptions to this pattern as well as allowing us to articulate a fully-fledged stress assignment system for the language

(3.44) Stress in verbs with ambiguous final syllables (penultimate mora):

- Unless lexical or morphological qualifiers (to be defined) precede them,
- Stress a final closed syllable, or otherwise, the penultimate.

3.4.2 Left-edge stress

At the beginning of our discussion of stress in Mapudungun verbs (cf. §3.4, above) it was noted that contemporary studies claim longer words have a second window for the assignment of stress, in this case at the left edge of the word. On closer inspection of these sources, as well as our own data, it becomes clear that this domain may be more easily referred to as that of the root, rather than a simple two-syllable window at the left edge.[31] Note that, as a matter of fact, almost all forms given in previous studies – and most forms in our own data – evidence left-edge stress within the domain of the root, as is made plain in the examples in 3.45.

(3.45) Root domain as left-edge stress (glosses our own, as well as root (R) marking):

a. *umáw*$_{\text{R}}$*-tu-lé-n* (Echeverría 1964: 48)
sleep-VB-PROG-IND.1S
'I am sleeping'

b. *elú*$_{\text{R}}$*-mu-j-ù* (Echeverría & Contreras 1965: 134)
give-INV.2SP-IND.1-D
'Us two, you gave X to'

c. *keʎú*$_{\text{R}}$*-pu-tú-ke-fú-n* (Smeets 2008: 49)
help-TRLOC-REST-HABIT-FUT-IND.1S
'I used to go back there to help'

d. *kà*$_{\text{R}}$*mapu*$_{\text{R}}$*-lé-j* ∼ *kamápu*$_{\text{R}}$*-lé-j* (Salas 2006: 74)[32]
other-land-PROG-IND.3S far-PROG-IND.3
'it is far'

e. *wejúl*$_{\text{R}}$*-kɨlé-j* (Zúñiga 2006b: 64)
swim-PROG-IND.3S
's/he is swimming'

[31] This connection is established by Augusta (1903) in an analysis that is not far removed from our own, as well as by Salas (1978a: 153), who does not further its implications in his later work.

[32] Note here that, although *kamapu* can be translated simply as 'far', this is most likely decomposable as two roots *ka* 'other' and *mapu* 'land'.

f. *kónR-me-tu-á-j-u* (original data)
enter-AND-REST-FUT-IND.1-D
'The two of us will come back in'

g. *kɨpáR-l-el-í-j-u* (original data)
come-CAUSE-APPL-IND-1-D
'The two of us bring x to y'

3.4.2.1 Root structure

The standard morphological assumption (cf. for instance Booij 2005: 28) is that the root is the simplex, underived form of a stem, and that a stem, in turn, is the domain of the word minus inflectional morphology. In this case, however, we will show that the stem excludes more than just inflectional items, being made up of the root and a small group of derivational suffixes with core semantics (cf. §3.4.3.1). Prototypical verbal roots (underived stems) in Mapudungun are overwhelmingly disyllabic, though monosyllables are found as well, both closed and open. Most trisyllabic roots are suspect in terms of constituting a single morpheme, or in terms of their verbal nature.

Mapudungun easily creates verbs from other word categories, either through verbalising suffixes (such as *-tu*[33]), or simply by adding verbal morphology (cf. Zúñiga 2006b: 163, Smeets 2008: 121-8, §1.2.2.2); so often the position of the verbal root is occupied by nominal or adjectival material, which may have wider structural possibilities.

Table 3.25: Example verbal roots by word-category base and number of syllables

Verbal Roots		Nominal and Adjectival Roots		
MONOSYLL	DISYLL	MONOSYLL	DISYLL	TRISYLL
kim- 'know'	*ʦi.pa-* 'exit'	*lif-tu*	*kofke-tu-*	a*ʃ.fɨ.θ-tu*
lef- 'run'	*ke.ʃu-* 'help'	'clean-VB'	'bread-VB'	'pea-VB'
i- 'eat'	*ɨ.ʦɨf-* 'throw'	*fem-*	*lepɨ-tu*	*kamapu-*
pe- 'see'	*θewma-*'make'	'thus, do thus'	'broom-VB'	'far, to be far'

[33]This suffix, though broadly used for a verbalizer meaning 'to do what the noun does', has the particular meaning of 'to eat x', where 'x' is the nominal root that the suffix attaches to (cf. *kofke-tu-j* 'bread-VB-IND.3 – s/he eats bread').

Furthermore, more than one root may be a part of a verb (as in 3.45d), especially in the case of SVCs and nominal incorporation (§1.7, §1.2.2.1).

3.4.2.2 Previous claims

The earliest claim concerning left-edge stress is actually the one that most closely mirrors our own. Fr. Félix de Augusta (1903: 4) maintains that compound-verbs (i.e. SVCs, verbs with nominal incorporation, and with a reduplicated root), have stress on the final syllable of the first root, while the second element is stressed according to the special rules of verb-stress (see §5.4). Furthermore, verbs with 'intervening particles' (i.e. verbs inflected beyond the obligatory finite inflection) also have a second stress, which falls on the verb root.

(3.46) Root and right-edge stress in Augusta (1903: 4) (glosses and translation my own)

a. *ʦ̣aná-nauɋ-í-j*
hit-descend-IND-3S
'S/he strikes down'

b. *θewmá-θewmá-j*
build-REDUP-IND.3S
'S/he builds on and on'

c. *ŋumá-ŋuma-ŋé-j*
cry-REDUP-PASS-IND.3S
'S/he has been cried and cried'

d. *jé-pá-j*
carry-CIS-IND.3S
'S/he carries x here'

e. *jé-pa-lá-j-m-i*
carry-CIS-NEG-IND-2-S
'You do not carry x here'

Note that right-edge stress is in the expected position according to Augusta's (cf. §5.4) as well as most contemporary Mapudungun-specific accounts (cf. §2.7). Furthermore, stress appears to be assigned to the final syllable of the verb root, though we can only be certain of this in the cases where we have two roots (3.46a-c). Augusta is not explicit regarding which root-syllable is stressed in the cases where there is only one root followed by 'particles'. The only example root provided is a monosyllable (ie *je-* in 3.46d,e), which for obvious reasons is uninformative as to the position of stress within the root. Interestingly, Augusta seems to place no restrictions on stress-clash, allowing for the stressed syllable of the root to be in immediate contact with right-edge stress (cf 3.46e).

Very early work by Adalberto Salas (1976:153) also claims that the domain of left-edge stress is the root, though this idea is replaced by that of a simple two-syllable window at the left edge, following the same rules laid out for simplex disyllables (cf. 1978a:80-81).

More recent studies make no mention of morphological structure. Both Salas (2006: 74) and Zúñiga (2006b: 64) claim stress is drawn towards a heavy syllable in the left-most two-syllable window (cf. 3.47). However, neither author provides much exemplification (principally, 3.45d-e, above).[34] Examples of non-verbal roots (3.47b), which may, furthermore, be decomposable (see 3.45d and fn. 32, above) also prove problematic, as the locus of stress may be conditioned by other word-categories or by the concatenated root morphemes. The case of 3.47b is also problematic in that the root is a borrowed noun, that would clearly be transparent to speakers (*huaso* ['wa.so]: Sp. 'Chilean cowboy').

[34]In this case, Zúñiga uses the exact same forms as Salas, which is natural enough since he is responsible for the posthumous re-edition of Salas' grammar (original from 1992). However, this lack of new material is unfortunate for our own purposes.

(3.47) Left-edge stress in Salas (2006: 74)

a. *pɨnán-tuku-lel-ŋe-ke-rké-j*
place-put.in-BENEF-PASS-HABIT-REP-IND.3S
'they say it is placed directly onto him/her/it'

b. *wásu-tuku-jaw-ke-rké-j* ∼ *wasú-tuku-jaw-ke-rké-j*
huaso-wear-AMB-HABIT-REP-IND.3S
'they say he goes around dressed as a huaso'

More data is clearly needed to establish whether stress is truly weight-dependent at the left edge. This said, as may be seen in 3.47b, a certain amount of alternation in the position of stress is allowed for. In this case, the alternation may simply be that of the nouns we observed in §3.2.1, or a result of the degree of internalization of the borrowing. More puzzling are forms such as 3.48, which are presented as part of an argument for the fact that the morpheme *-fi* (3rd person patient in direct forms) is usually stressed. We are told that there is a clear tendency for stressing *-fi*, as in 3.48a, but that 3.48b and even 3.48c are possible forms.

(3.48) Stress on *-fi* and root-stress alternation (Salas 2006: 74):

a. *léli-fí-m-i*
watch-DIR.3SP.IND-2-S
'you watch him/her/it/them'

b. *lelí-fi-m-í*

c. *léli-fi-mí*

The contrast with Augusta's 1903 account is stark insofar as the given forms appear to imply some form of clash-avoidance. Also, the position of final stress is odd, as per a penultimate mora account. However, in order to explain these forms we may need further context, both for the position where these forms appear within the syntax, and of additional forms such as those we provide in the next section.

3.4.2.3 New data for root stress

Analysis of the same 282 verbs presented above for right-edge stress found that the final syllable of the verbal root is regularly stressed (191 cases, 68%). Of these, 50 verbs were such that predicted right-edge stress coincided with the final syllable of the root. We use the term 'conflation' for such cases, as it is unclear on the surface whether root-final or penultimate mora stress is responsible for the pattern.

(3.49) Conflation of root-final and right-edge stress:

a. *mo.ŋé-j-m-i*
live-IND-2-S
'you live'

b. *tʃo.jú-n*
bear-IND.1S
'I bore x'

In another 114 cases, root-final stress occurred without interacting with right-edge stress, that is, at least one syllable intervened between the final stressed syllable and right-edge stress[35]. Crucially, here we find that the final syllable of the root is stressed in a series of two open syllables (3.50a), in an open syllable followed by a closed one (3.50b), or in a heavy syllable followed by a light one (3.50c). Furthermore, monosyllabic roots also bore stress in this context, both in closed (3.50d) and in open syllables (3.50e).

[35]This number includes four cases where a nominal root element was stressed on the penultimate syllable, while right-edge stress was immediately adjacent to the root. These are clearly a separate pattern from the unstressed root pattern, as nouns have proven to alternate stress in the language. Furthermore, two roots were Spanish borrowings *tortilla* 'flat bread', and *masa* 'dough', originally bearing penultimate stress. The other two cases were both *kófke* 'bread', a typical alternating form in the nominal data, which we find two additional cases for with final stress that does not interact with right-edge stress. Furthermore, two forms of the verb *leli-* 'watch', which were stressed on the first syllable with no apparent relation to right-edge stress, are included. The root also shows stress on the final syllable, where there is no conflict with right-edge stress

(3.50) Root-final stress in verbs (no interaction with right-edge stress)

a. *ʈʂe.ká-ja.w-á-j*
walk-AMB-FUT-IND.3S
's/he will walk around in circles'

b. *ŋi.ʎá-ɲ.ma.-fí-j*
buy-DIR.3SP-IND.3S
's/he bought this from him/her/ them'

c. *θew.má.-ŋe.-kí-j*
make-PASS-HABIT-IND.3S
'it was usually built'

d. *léf.-pu.-lé-j*
run-TRLOC-PROG-IND.3S
's/he was running here'

d. *í.-la.-já-j.-m-i*
eat-NEG-FUT-IND-2-S
'you won't eat'

In 27 tokens, stress fell on the root-final syllable, presenting no right-edge stress whatsoever. Of course, these are mostly the cases we have seen to have 'ambiguous' final segments, though there are a few exceptional 'unambiguous' cases (§3.4.1.2). In all these forms, right-edge stress would have been predicted on the syllable immediately following the root.

(3.51) Root-stressed verbs lacking predicted right-edge stress:

a *θew.má.-ki-j*
build-HABIT-IND.3
's/he usually builds x'

b *ʈʂi.pá.-la-j*
exit-NEG-IND.3
's/he did not go out'

The roots that display this particular pattern are overwhelmingly among those listed by Augusta (1916) as having fixed stress on the final syllable (3.52).[36] The only exceptions here are the verbs *elu-* 'give' (three times) and *leli-* 'watch' (once) which, although not mentioned as having fixed stress in the language, seem to alternate widely in our data as well as in other accounts (see, for instance 3.48).

(3.52) Verb-roots with fixed stress (data from Augusta 1916):

θew.má-	'build'	p. 30		x4
ʈʂ.ipá-	'exit'	p. 232-3		x6
mɨ.lé-	'be'	p. 137-8		x2
ʈʂa.pé-	'bring together'	p. 226	usually with *-ɨl* '-CAUSE'	x1
ʈɨŋá-	'dig'	p. 198	usually with *-ɨl* '-CAUSE'	x1
kɨ.pá-	'come'	p. 106	usually with *-ɨl* '-CAUSE'	x10
ɨʈʂɨf-	'throw'	p. 277		x24

There are also 10 verbs where stress is found on the root-final syllable, immediately adjacent to right-edge stress (i.e. in CLASH position). Most of the roots in these forms also fall within the category of fixed root-final stress. Furthermore, in all but two of these cases the final syllable of the word corresponds to the -IND.3S, identified with a tendency for stress alternation. In other words, in this category, both root and right edge stress appear highly resistant to de-stressing.

[36] A closer look at these 'fixed stress' roots shows a fair number of them to have an interconsonantal [ɨ], which in practice alternates with [ə] and [∅]. This is precisely the pattern we have seen for epenthetic vowels (cf. §1.5). This said, we cannot simply consider these forms to be monosyllabic, as monosyllables do not tend to trump right-edge stress. At least some of the other forms appear to have internal morphological structure that explains their fixed stress, even if they are not synchronically decomposable: *θew-má-* 'finish-TRANS'; *ʈʂ.i-pá-* '?-CIS' (ʈʂi may be the same as ʈʂe in ʈʂe-ka 'walk' = '?-CONT'); *ʈʂa.pé-* < *ʈʂaf-pé-* 'next.to-PX-'. A more detailed study of these forms, however, excedes the scope of this study.

(3.53) Root and right-edge stress clash:

a. *ʈʂi.pá.-lá-j*
exit-NEG-IND.3S
's/he did not exit'

b. *i.ʈʂíf.-tú-j*
throw-RESTORE-IND.3S
's/he threw x back'

There are, however, 81 cases in which root stress seems to be altogether absent.[37] This occurs both in disyllables (41 cases) as well as in monosyllables (40 cases). This lack of root-final stress occurs mostly where right-edge stress falls on the syllable immediately following the root (in CLASH).

(3.54) No root stress:

a. *e.lu.-á.-j-u*
give-FUT-IND.1-D
'We two will give x'

b. *a.mu-lá-j-m-i*
go-NEG-IND-2-S
'you didn't go'

c. *ko.n-í-j*
enter-IND-3S
's/he enters'

d. *wɨ.l-í-j*
give.away-IND-3S
's/he gives x away'

[37]Note that this number does not include the four nominal-roots with penultimate stress (cf. 35), which added to the overall tokens with root-stress make up the total surveyed. This number does, however, include forms where the root remains unstressed when immediately adjacent to a suffix defined as 'inherently stressed' below (3.56 and Table 4.11), but which will be re-categorised in the same section.

Among these cases, 11 were found to have neither root-final stress, nor penultimate mora stress (i.e. the locus of right-edge stress). These cases are discussed in the next section, on the interaction of final and root-stress.

For the meantime, simply based on the overall frequency of its occurrence, there are enough grounds to claim that Mapudungun verbs bear root-final stress.

(3.55) Left-edge stress in Mapudungun verbs:

- Overwhelmingly, left-edge stress is actually root-final stress.

3.4.3 Final- and stem-stress interaction

Data in the preceding sections show a pattern where, overwhelmingly, Mapudungun verbs are stressed on a moraic trochee aligned to the right edge of the word, as well as on the rightmost syllable of the verb-stem.[38] However, the issue that has been visibly avoided so far, is that of the hierarchy of prominences within the verb. This is no accident. It appears we are not dealing with two outputs of the same stress-assignment system but with two independent assignment systems which – at least to the naked ear – have no obvious hierarchical organisation, applying to separate domains. Such independence of the two stresses means that their prominence need not be mutually 'relative', except where they are directly adjacent, an issue that we examine in this section.

3.4.3.1 Stem vs. root stress patterns

Another topic that has been skirted so far is that of cases where stress is neither on the final syllable of the root nor on the last pre-consonantal vowel. In all of these cases,

[38]For reasons we will present below, the verb root is considered to be indistinguishable from the complex stems insofar as stress assignment is concerned.

stress falls on either a valency-changing suffix (*-ɲma*, *-ŋe*, *-i̇m*, *-lel*, *-i̇l*) or the proximity/validity suffix *-pe*, all of which appear to be very closely attached (semantically and phonologically) to the root.

(3.56) Unexpected stress – not root final, not right-edge true:

a. *l̪aŋ.-i̇́m.-fi-j* *(x4)*
die-CAUSE-DIR.3SP-IND.3S
's/he killed him/her/them'

b. *pe-ɲ.má.-fi-j* *(x1)*
'see-APPL-DIR.3SP-IND.3S
's/he sees the x's x'

c. *e.lu-ɲ.má.-fi-j* *(x3)*
give-APPL-DIR.3SP-IND.3S
's/he gives x to him/her/them'

d. *ʈ̣a.p-é.l-i-j* *(x1)*
come.together-APPL-IND-3S
's/he tied x to y'

d. *pi.-ŋé.-fu-j* *(x1)*
say-PASS-BI-IND.3S
's/he was once called x (but no longer)'

e. *e.lu.-pé.-fi-j* *(x1)*
give-PX-DIR.3SP-IND.3S
's/he certainly has been giving'

f. *i-pé-fi-j*
eat-PX-3SP-IND.3S
's/he certainly just ate it/them'

First of all, note that the forms in 3.56 cannot be explained by a version of left-to-right iambs (quantity insensitive or otherwise), nor can they be seen as bearing stress within the leftmost two-syllables of the word. The stress-bearing suffixes are, however,

always attached immediately following the root and add core semantic content to it. We note that all the stressed suffixes in 3.56 belong to Slots 23 or higher (cf. §3.4.1.1), except for *-pe*, which occupies Slot 13, according to Smeets.[39] This means that these are generally the slots nearest the root, which suggests a special bond with it. In the case of *-pe*, while Smeets is somewhat unsure of the positioning of the suffix (2008: 247-8), in our data it is always immediately adjacent to the root.

The consistency of suffix-stress despite local stress alternations further tends to support the idea of them bearing fixed stress. The suffixes take stress by overriding both the position of final stress and that of root stress (as shown in 3.56). Furthermore, the suffixes often fall precisely in the predicted position for right-edge stress, in which case they never share similar prominence level with the root stress 3.57.

(3.57) No root stress in the context of valency changing suffixes:

a. *je-ɲmá-j*
carry-APPL-IND.3S
's/he carries x for herself' or 's/he wears x')

b. *tʃoju-ŋé-n*
bear-PASS-IND.1S
'I was born'

c. *pi-ŋé-j-u*
say-PASS-IND.1-D
'We two are called'

The only major exception to this occurs when the suffixes are immediately preceded by roots that are independently attested as having lexical stress (see Table 3.22 above, and 3.58 below).

[39]The only suffix in our data that is also in this range and is not included in 3.56 is *-kɨle* '-PROG', for which our data is inconclusive as regards its stressability.

(3.58) *-ɲma* and *-ŋe* following roots with lexical stress:

a. *θewmá-ŋe-kí-j*
build-PASS-HABIT-IND.3S
'it was built'

b. *ŋiʎá-ɲma-fí-j*
buy-PASS-DIR.3SP-IND.3S
's/he bought x from him'

A further suffix, the causative *-(i̇)l*, shows a similar pattern. In our data, the suffix only appears in its non-syllabic form (after vowels). However, where it is attached directly to the root, the final syllable of the root is always stressed, even in direct adjacency to predicted right-edge stress. In such cases, right-edge stress is consistently lacking, as in the examples in 3.59. The pattern is no doubt akin to that which we find for verbs with lexically specified root-stress in (cf. 3.52).

(3.59) Lack of right-edge stress in the case of *-(i̇)l*-causative suffixed verbs:

a. *ri̇.ŋá-l.-fi-j*
burrow-CAUSE-INV.3SP-IND.3S
's/he digs it'

b *ki̇pá-l-i-j*
come-CAUSE-IND-3S
's/he brings'

A further peculiarity of some of these suffixes is that, in their context, specific verb roots undergo phonological adjustments that are unique as compared to the rest of the grammar. This type of 'root allomorphy' is no doubt a sign of the special status of the bond between the root and these suffixes, as we have seen for the suffix *-i̇m* (cf. Table 3.20). Here we add an example for the applicative *-(l)el* (cf. 3.4.1.1).

Some degree of lexicalisation of the suffixed forms in Table 3.26 may explain the alternation in the form of the root. This may also be claimed for the differences

Table 3.26: Root allomorphy in the context of *-ɨm* and *-(l)el*

ROOT	MEANING	ROOT-SUFFIX	MEANING
la-	'to die'	*laŋ-ɨm*	'to kill'
af-	'to end'(INTR.)	*ap-ɨm*	'to finish'(TR.)
ʎeɯɻ-	'to come up'	*ʎeɯɻ-ɨm* ∼ *ʎek-ɨm*	'to bring up'
ʈʂaf-	'to put together'	*ʈʂap-el*	'to tie'

in the contraction patterns and semantics of the suffix *(ɨ)ɲma* ∼ *ɲma* (cf. 3.4.1.1). Nevertheless, both processes evidence the close bond between root and suffix, where speakers are prepared to accept idiosyncrasies.

Finally, the proximity/validity marker *-pe* seems to pattern with the valency-changing suffixes *-ɨm*, *-ɨl*, *-ɲma -lel* and *-ŋe* in terms of stress. Here, our data is slightly more sparse, but it appears that *-pe*, as an evidential, has a tendency to attract focus stress (cf. 3.60a). As in the case of the valency-changing suffixes, it is found in contexts where predicted root (3.60.a-c) or right-edge (3.60.a,b) stress are absent.

(3.60) Invariant stress on *-pe* suffix

a. *tufatʃi fɨta wentru elu-pé-fi-j ta ekɨʌ*
this old man give-PX-DIR.3SP-IND.3S the shawl.
'this old man *certainly* just gave him/her/them the shawl.'

b. *i-pé-fi-j tʃi ɨʌtʃa.*
eat-PX-DIR.3SP-IND.3S the girl
'the girl just ate it'

c. *tatʃi θomo maj pe-pí-j tʃi ajwiɲ mawiθa*
this woman AFFIRM see-PX-IND.3S the shadow woodland.
'the woman did *certainly* see the woodland's shadow'

Taking into account the core argument-structure semantics added by these suffixes, their overriding of neighbouring stress, their proximity to the root, as well as the alternation in the phonological shapes of roots and suffixes, these root-suffix sequences,

Table 3.27: Stem-extending suffixes

FORM	GLOSS	SLOT
-pe	PX	Slot 13
-(ɨ)ɲmá	APPL	Slot 26
-(l)el	APPL	Slot 27
-ɨ́m	CAUSE	Slot 34
-(ɨ)l	CAUSE	Slot 34
-(ɲ)má	TRANS	Slot 35

it is proposed here, can be described either as 'extended roots' or, more properly, as verbal stems.

(3.61) The verbal stem in Mapudungun:

- The verbal stem is composed of the root plus a series of core derivational suffixes most of which change the root's argument requirements.
- The stem-final syllable in Mapudungun is the locus of leftmost stress.

If stress reliably falls on the stem-final syllable, then the domain of the stem can be seen as an extension of the domain of the root, with identical constraints on stress assignment. This pattern would be predictable simply by the application of final-syllable stress not to the ROOT but to the STEM domain, which includes both roots and stems. Once we have revisited the data for final and root-stress interaction in the light of the stem stress-domain, we will come back to formalise the stress system for the stem domain in §4.3 of the following chapter.

3.4.4 Summary of new data for verbs

The new data presented in this section shows that morphological structure has a clear effect on the position of stress in verbs. We have found that both penultimate mora stress and stem-final stress are robust phenomena in the language, yielding, in longer

verbs, two stresses with unclear prominence relations. The key issue that must be discerned is the interaction of the two stresses when they are directly adjacent. It appears that when the stem is underived, the main prominence falls on the rightmost stress (cf. Table 3.28.e), while when the stem is derived, stem-stress takes priority (f). The patterns are summarised in Table 3.28, with the number of tokens in each category. Note that these numbers differ from those in §3.4.2.3, as the relevant domain for leftmost stress is redefined as that of the stem, rather than the simplex root.

Table 3.28: Patterns of STEM (S) and WORD (ω) stress interaction (stressed syllables underlined, optional syllables in parenthesis)

	Structure	Pattern	N	Percentage
a.	$[[(\sigma)\ \underline{\sigma}]_{\text{S}}\ \sigma_1\ \underline{\sigma}(\sigma)]_\omega$	No interaction	114	(40.4%)
b.	$[[(\sigma)\ \underline{\sigma}]_{\text{S}}(\sigma)]_\omega$	Conflation	68	(24.1%)
c.	$[[(\sigma)\ \underline{\sigma}]_{\text{S}}\ \underline{\sigma}(\sigma)]_\omega$	Clash	10	(3.5%)
d.	$[[(\sigma)\ \underline{\sigma}]_{\text{S}}\ \sigma(\sigma)\ ]_\omega$	WORD de-stress	38	(13.5%)
e.	$[[(\sigma)\ \sigma]_{\text{S}}\ \underline{\sigma}(\sigma)]_\omega$	STEM de-stress	52	(18.4%)

In the following chapter, we will attempt an account of these interactions based on the cyclic application of rules. As may be expected, amongst these rules, those which deal with repairing stress clash will be crucial.

3.5 Overall summary of new data for Mapudungun stress

This chapter has dealt with the new body of data gathered for the purposes of understanding the nature and position of stress in Mapudungun. This data is all based on original interviews gathering data for simplex nouns, nominal compounds and verbs, both in isolation and in context. A baseline for the acoustic cues to stress was established through the examination of the monomorphemic nouns provided in isolation, as

matched to native speaker judgements. Here, pitch maxima were found to correlate robustly to the native-speaker assigned position of nominal stress.

The reliability of native speaker judgements and their independence from Spanish-speaker intuitions were confirmed in a brief non-native speaker perception study of disyllabic stress.

The data for nouns was found to be consistent with a penultimate mora analysis of stress position, as proposed elsewhere in the literature (see Chapter 2). Nevertheless, most patterns can also be explained through a (quantity sensitive) iambic pattern. Neither of these sets of parameters, however, can explain the alternation in stress position which we find in vowel-final disyllabic nouns. A look at the data for nouns in context, furthermore, found no clear relationship between the alternation in stress position and the noun's position in the phrase. An overall greater proportion of word-final stress was found, however, among these nouns in context.

The data for nominal compounds shows that the penultimate mora analysis fits well with the right edge of the entire compound, where it falls within the second stem. The only major exception to this are monosyllabic stems in the second position, which are always stressed, even when they are light. In the case of the first stem, it was also found to bear stress quite consistently. While disyllables in the first position are always stress-final (regardless of weight), trisyllables are stressed on a final heavy, otherwise on the penult (i.e. a penultimate mora). The interaction of the two stresses in compounds (i.e. their immediate adjacency), has furthermore been shown to be resolved in favour of stress on the (morphosyntactic) head.

Finally, in verbs a two-stress pattern has been identified, one closely following the penultimate mora of the word – as attested for other word categories in our data – and another on the final syllable of the stem. While in the case of their interaction it is usually the word-edge stress that dominates, derived stems seem to hold sway over

the word in promoting their own, final stress.

Although the basic patterns for the position of stress have been put forth here, their formalisation in the next chapter will need to deal with a number of unexpected patterns. Some of the key issues are the differences in the apparent foot structure at the right-edge of the word versus the leftmost stress of disyllabic verb-stems and nominal compounds. Also, the difference between di- and trisyllabic stem-stress in the first element of compounds must be accounted for. Finally, the issue of the alternation in light-final disyllabic stress remains enigmatic.

Schematically, the new data for Mapudungun stress is summarised below:

(3.62) Nominal stress:

- Disyllables (Data):
  - Native stress intuitions are correlated to the greatest maximal pitch within the nucleus of the tonic syllable.
  - Mapudungun stress position is accurately perceptible by speakers of other languages.
  - Mapudungun stress is not equivalent to Spanish patterns or cues (the native system survives).
- Disyllables (structure):
  - Final closed syllables are invariantly stressed.
  - Vowel final words alternate stress both in isolation and in context.
  - There is a greater proportion of disyllables stressed on a final vowel when nouns are in context.
- Trisyllables:
  - Closed final syllables bear stress.
  - Otherwise, the penultimate is stressed.
  - No differences were found between nouns in context vs. those in isolation.

(3.63) Verbal stress:

- Right edge:
  - Stress position follows that of trisyllabic nouns (penultimate mora).
  - Exceptions occur where predicted right-edge stress is immediately preceded by derived stems and roots with fixed stress.
- Left edge:
  - The final syllable of verb stems tend to bear stress.
  - Stems are roots plus a small class of core derivational suffixes.

Chapter 4

Mapudungun Morphoprosody Today: *Stress assignment system*

The data for Mapudungun stress presented in the previous chapter does not fit in squarely within any of the published accounts of stress assignment for the language (cf. Chapter 2). The difference in the behaviour of stress in open and closed syllables at the right-edge of the word (as well as in trisyllabic stems in compounds) argues strongly against the basic foot type being a quantity-insensitive iamb, a pervasive claim in the typological literature (based on Echeverría & Contreras 1965, see §2.3).

Furthermore, although the new data confirms the tendency – given in most Mapudungun-specific literature (cf. Suárez 1959; Salas 2006; Zúñiga 2006b among others) – to stress the final pre-consonantal vowel (i.e. the penultimate mora), these analyses remain unsatisfying on a number of counts. The strong tendency for stem final stressing in verbs (and disyllabic stems in compounds), as well as the numerous unpredictable patterns of interaction of word- and stem-level stress are neither mentioned directly nor addressed formally in such work.

The key issue that previous accounts of stress in the language have neglected is that

of the influence of morphological structure on the position of prominences. Although Echeverría (1964: 48) suggests stress position could be conditioned on the 'morphemic level', he undertakes no further research on the topic. Augusta (1903: 4) as well as Salas (1976: 173) claim the position of secondary stress in verbs falls on the root-final syllable, but they do not deal with its interaction with stress on other morphemes. Finally, a number of suggestions regarding the lexically specific nature of stress in morphemes has been made (cf. Smeets 2008: 50, for a number of suffixes, and Salas 2006: 74 and Zúñiga 2006b: 64 for *-fi*), yet no comprehensive analyses of this issue is undertaken.

This chapter attempts a formalisation of the stress assignment system of the language based on the new data presented in Chapter 3. We begin by analysing the feasibility of the right-edge moraic trochee analysis for monomorphemic nouns (§4.1), to later move on to justify the position of stress in nominal compounds (§4.2), in particular with reference to the first stem (which we analyse as a first order prosodic word). Key to this proposal will be the use of a single foot-type alongside syllable-initial extrametricality, which allow us to deal with the puzzling alternation between di- and trisyllabic stress in the first elements of compounds. The interaction of prominences will, furthermore, be dealt with by a post-lexical rule promoting the stress on heads of compounds.

Moving on, we will analyse the domains of stress assignment within the verb (§4.3); these are defined as the word's right-edge and the right-edge of the stem. Again, we will invoke a single foot-type for both domains. The stem will be shown to be built cyclically (§4.3.2), thus providing the alternations in stress dominance which we find between derived and underived stems. Based on the generalisations developed in compounds and verbs, finally, the alternation in light-final disyllabic nouns is revisited and accounted for through the application of post-lexical footing and prominence assign-

ment rules. These conclusions are further contextualised through the examination of stress in derived nouns and adjectives.

Overall, the analysis provided is based on a single set of rules applied to the stem, word and post-lexical levels. This levelled application of rules is framed within the standard assumptions of the theory of Lexical Phonology and Morphology (Kiparsky 1982, 1985; Mohanan 1985). It is claimed that the stratal approach of the theory and its inheritors, Prosodic Lexical Phonology (Inkelas 1991; Fitzpatrick-Cole 1996) and Stratal Optimality Theory (cf. Kiparsky 2000, 2008, Bermúdez-Otero 2011, 2014), can give a fairly natural, principled and exhaustive account of the alternations in the data.[1]

4.1 Stress assignment in monomorphemic nouns

Data for Mapudungun nominals provide us with preliminary input so as to place the language's stress assignment within a foot-based, parametric system. The key importance of these data is that, in being monomorphemic, such nouns allow us a view into the behaviour of stress assignment at a purely phonological level, that is, without the incidence of morphology.

What is clear from both the disyllabic and trisyllabic forms (recall the language lacks longer monomorphemes), is that stress cannot be allocated on the basis of a simple syllabic system. The difference between open and closed syllables is crucial to this effect, in particular as regards the final syllable of both di- and trisyllables. Table 4.1 shows how final closed syllables are always stressed, and how, while stress is always penultimate in trisyllables with a final open syllable, disyllables with the same final open syllable alternate stress.

[1]See §4.5.1.2, in our general discussion of stress assignment at the end of this chapter, however. Here we claim that the cyclic phenomena we have proposed for the stem domain of Mapudungun verbs is incompatible with Stratal OT's reliance on ordered levels alone, without cyclicity within strata.

Table 4.1: Monomorphemic nouns with final open and closed syllables

	Final syllable closed		Final syllable open	
2σ	*kɨ.ɻúf*	'wind'	*wíŋ.ka* ∼ *wiŋ.ká*	'foreigner'
	aj.wíɲ	'shadow'	*θó.mo* ∼ *θo.mó*	'woman'
3σ	*a.li.wén*	'tree'	*e.kó.ta*	'sandal'
	a.tʃuʌ́.péɲ	'floating ash'	*a.nɨ́m.ka*	'plant'

The pattern that emerges (setting the alternation data aside), is one where weight-by-position must be central to the stress-assignment algorithm. In other words, the mora – taken as a construct that represents the prosodic difference between syllables with or without a coda (Hyman 1984, 1985; McCarthy & Prince 1986; Hayes 1989) – is the fundamental 'counting' unit for stress, and the atom of the Mapuche metrical system.

Note, however, that the data in Table 4.1 still cannot decide whether the language is fundamentally iambic or trochaic. If we assume that main stress is always at the right edge, and that iambs are parsed left to right and trochees, right to left, both foot types will ensure a final closed syllable is stressed (cf. Table 4.2 c,d,f). In the cases where the final syllable is light, predictions vary. In disyllables, opposite predictions are made for two open syllables (cf. Table 4.2a), while identical predictions are made for a closed-open sequence (cf.Table 4.2b). In trisyllables, the picture is not substantially better, with all attested forms coinciding in their predictions, the exception being a single closed syllable followed by two open ones (cf. Table 4.2h). Unfortunately, the pattern is rare in the language and attested in the data for only one word in two interviewees. Other patterns of open and closed syllables are unattested or suspect as regards their morphological simplicity (cf. 3.8).

The similarities between the predictions for iambs and those for trochees are more immediately striking than the differences for the data in Table 4.2. Clearly, if the

Table 4.2: Moraic trochee vs. iamb in nouns (predicted stressed syllable underlined; open syllables = 'L'; closed syllables = 'H')

	Moraic trochee right-left, ER: right	Iamb left-right, ER: right	Example	Gloss
a.	(L̲L)	(LL̲)	[kú.ɻa] ∼ [ku.ɻá]	'stone'
b.	(H̲)L	(H̲)L	[píw.ke] ∼ [piw.ké]	'heart'
c.	L(H̲)	(LH̲)	[kɨ.ɻ́if]	'wind'
d.	(H)(H̲)	(H)(H̲)	[l̪af.kén̪]	'sea'
e.	L(L̲L)	(LL̲)L	[ma.wí.θa]	'woodland'
f.	(LL)(H̲)	(LL)(H̲)	[a.tʃa.wáʎ]	'hen'
g.	L(H̲)L	(LH̲)L	[a.nɨ́m.ka]	'plant'
h.	(H)(L̲L)	*(H)(LL̲)	[puŋ.pú.ya]	'armpit'

marginal category of HLL words is all that a child acquiring Mapudungun has to go on for establishing the stress-assignment system, then it is unlikely that a clear set of parameters can be abstracted. In this sense, a possible conclusion is that alternations in disyllables are simply a reflection of the two possible foot-types being active in the language, perhaps as a result of the asymmetric contact conditions outlined above (§3.2.1.3, §1.1).

The idea that inconsistency in disyllabic stress can be ascribed to two competing stress assignment systems vying for predominance in the speakers' grammar, however, is shown to be flawed if we look at the data more carefully. This explanation can, at best, account for the light-light cases, but not for the heavy-light ones, where stress placement predictions converge on the first syllable. Even if a stressed degenerate foot were assigned to the stray light syllable in these cases, such an analysis is available to both foot types, providing no evidence to the learner. Furthermore, there seems to be no reason for a degenerate foot of this type to apply to final light syllables in trisyllables, which, if true, would predict that nominal stress would always be final.

4.1.1 Formalisation of nominal stress

If we can cautiously set aside the data for light-final disyllables, and focus on the non-alternating nouns, we are left with overall consistency in nominal stress assignment, even for rare words of the '*puŋ.pú.ya*' (HLL) type. Interestingly enough, the fact that there is consistency in the rarer forms is already symptomatic of a well-established stress-assignment system, in this case, trochaic. It is unlikely that the entire system is built upon the basis of these rather obscure forms, so evidence for such prosodic organisation must be found elsewhere in the grammar.[2] As no clear pattern was reported for secondary stress in trisyllables, and no acoustic correlations could be drawn with the possible loci of secondary stress (cf §3.2.2.3), we assume that the stress system allows for only one stress per morphological domain, footing a single moraic trochaic foot at the right edge.

(4.1) Mapudungun stress parameters, preliminary version (nouns):

FOOT TYPE: Moraic Trochee – (L̲L) or (H̲)

DIRECTION OF PARSING: Right to left

END RULE: Right

ITERATION: None

SAMPLE PARSINGS:

	(x .)			(x .)	
a.	*má. pu*	'land'	b.	*ma. wí. θa*	'woodland'
	(x)			(x)	
c.	*wíŋ. ka*	'foreigner'	d.	*a. nɨ́m.* ka	'plant'
	(x)			(x)	
e.	*ma. wún*	'rain'	f.	*a. tʃa. wáʌ*	'hen'

[2]The implication here is that such patterns are not 'identified' only in a metalinguistic study such as this, but more fundamentally by the language learner in the process of acquiring the language's prosodic structure.

It is with this preliminary version of the Mapudungun stress assignment system in mind (4.1), and the need to find a larger body of consistent data from whence to confirm it, that we turn to the next section, dealing with the verbal elements in our fieldwork.

4.2 Stress assignment in nominal compounds

In Chapter 3 we established that Mapudungun N-N compounds bear a single stress mark on each one of the two elements they are composed of. These elements are also free-standing in a way that varies substantially from verbal stems (or roots), which never stand alone, requiring either an inflectional ending or a category-changing derivational suffix (cf. §1.2.2). In this sense, we have a first piece of evidence so as to consider the sub-elements of compounds as the first stratum in a recursive prosodic word structure, where the second, superordinate stratum is the compound itself.[3]

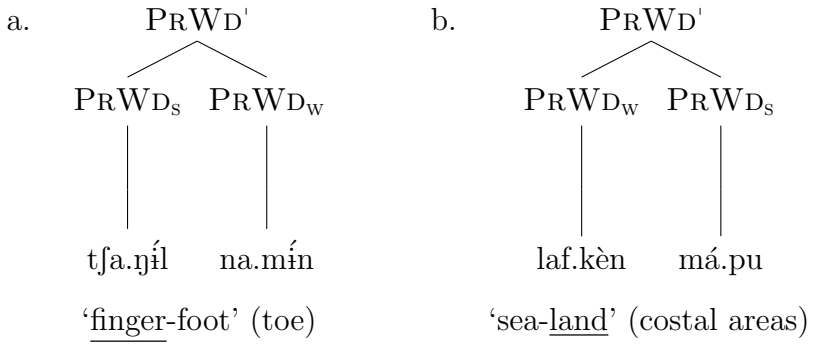
To this first piece of evidence, we may add the fact that in slower speech the relative prominences of the two elements may vary, and that speakers are able to articulate the two with an intervening gap.[4] However, since both head-initial and head-final compounds are found in the language, the head is usually signalled by a boost in stress prominence, especially where the two stresses are adjacent.[5]

[3]The differences in the behaviour of stress assignment in compounds and in verbs will further justify the recursive structure, as we shall see in §4.3.4.

[4]For more details on the characteristics of Mapdungun compounds see Baker & Fasola (2009)

[5]Note that, where there is no adjacency between stresses, we mark both stresses with the acute marker, implying that both stresses appear to be at the same level or alternate according to speech style. We use the grave mark in the context of adjacency to mark the difference in prominence between the two forms, which favours the head (marked by the acute).

(4.2) Mapudungun compounds as recursive prosodic words (head-initial and head-final):



4.2.1 Stress on the rightmost prosodic word

The position of stress in the second prosodic word is uncontroversial, consistently following the same right-aligned trochee pattern as that proposed in §4.1.1 for nouns. The word's possible stress patterns, however, are slightly limited as disyllables are the longest elements for this position in our data. Crucially, there is no alternation in the position of stress in light-final disyllables (cf. Table 4.3b,e), and monosyllables are consistently stressed regardless of the fact that they may be made up of a single open syllable (cf. Table 4.3c,f). The word boundary is crucial here, as the moraic trochee may not span the internal boundary between the two constituents of the compound (cf. Table 4.3c,f).

Table 4.3: Rightmost prosodic words stress in compounds: (hierarchical organisation of stress only clearly signalled under clash)

	HEAD-FINAL		
a.	*tʃa.fó-ku.ʈsán*	cough-disease	'a cold'
b.	*l̪af.kèn̪-má.pu*	sea-land	'costal areas'
c.	*wa.rí.ja-tʃé*	city-person	'cityfolk'
	HEAD-INITIAL		
d.	*ʈsa.rí-man.sún*	knot-ox	'oxen team'
e.	*fo.ró-tʃàʎ.wa*	bone-fish	'fishbone'
f.	*rel.mú.-ŋè*	rainbow-eye	'iris'

The fact that we do not find forms such as **wa.ri.já-tʃe* for Table 4.3c or **rel.mú.-ŋe* (without secondary stress) for Table 4.3f shows that the internal morphological structure of the compound is prioritised over the footing of a canonical moraic trochee. In the absence of the minimal two moras for such a footing (which is well attested for disyllables), a degenerate monomoraic foot must be footed on the light syllable coextensive with the rightmost prosodic word.

4.2.2 Stress on the leftmost prosodic word

The data for stress on the first element of compounds is particularly baffling as regards the difference between di- and trisyllables. The key here is that when the leftmost word has only two syllables, stress falls on the final syllable irrespective of weight. Forms with three syllables place stress on the final if heavy, and on the penultimate if the final is light. As in the case of the rightmost word, monosyllables are consistently stressed, even if this entails footing an open syllable as a monomoraic foot (Table 4.4e,j).

Table 4.4: Leftmost prosodic word stress in compounds

	HEAD-FINAL		
a.	*pi.ʎán-kɨ.ʎíŋ*	power-animal	‘sacrifice’
a.	*ku.θì-fó.ro*	mortar-bone	‘spine’
c.	*wa.rí.ja-tʃé*	city-people	‘cityfolk’
d.	*a.tʃa.wàʎ-rú.ka*	hen-house	‘henhouse’
e.	*ké.-ku.tʃán*	liver-disease	‘hepatitis/cirrosis’
	HEAD-INITIAL		
f.	*n̻a.mɨ́n̻-me.sa*	foot-table	‘table-leg’
g.	*fo.ró-tʃàʎ.wa*	bone-fish	‘fishbone’
h.	*i.nál.tu-laf.kén*	edge-ocean	‘seashore’
i.	*fo.tí.ʎa-púl.ku*	bottle-wine	‘bottle with wine’
j.	*tʃé.-ma.mɨ́ʎ*	person-wood	‘totem pole’

This data is striking in that it appears to display, for trisyllables, the same right-aligned moraic trochee as that proposed both for monomorphemic nouns (cf. §4.1.1) and for the rightmost prosodic words in compounds (cf. §4.2.1). If this is the case, of

course, it would provide important analytical advantages, as a single type of foot could be built at the edge of both prosodic words. Furthermore, subsuming both PrWds into one stress-assignment algorithm would give an advantage from the point of view of learnability. If we consider the trochaic pattern to be basic, however, there must be some kind of special restriction that affects stress in disyllabic words as the first elements of compounds.

4.2.3 Initial-syllable extrametricality

Left-edge extrametricality (initial-syllable extrametricality or, in OT terms, non-initiality) is precisely the type of restriction that could – in combination with trochaic footing – potentially distinguish disyllables and trisyllables in terms of their stress. As a structural constraint, such extrametricality would make the initial syllable of a domain invisible for the purposes of footing and stress assignment. In this case in particular, extrametricality would forbid the head of a moraic trochee from being footed onto the initial syllable of a disyllabic root (where its final syllable is light). Under such pressures, a degenerate monomorphemic foot would be built on the final open syllable of the disyllabic domain. As in other languages (see for instance Hayes 1982 for Latin and Buckley 1994, 2009 for Kashaya), syllable extrametricality would fail to apply to monosyllables, which are usually stressed in Mapudungun.[6]

Invoking initial extrametricality requires some justification at the level of our own data, restricting its domain of application and articulating it with the patterns we find in other word categories and structural positions. It also must be justified within the broader prosodic literature, in particular with reference to claims that the invisibility of a prosodic unit may only occur at the right edge (Hyde 2002, 2011; Altshuler 2009).

[6]This corresponds to a more general idea regarding extrametricality which claims that this restriction cannot apply if it would render the whole form (or domain) invisible in what has been termed the 'whole-form-exception' or 'non-exhaustivity' (Hayes 1982, 1995; Baker 1989).

Table 4.5: Initial-syllable extrametricality (ExMtr) in one, two and three syllable words (extrametical syllables in pointed brackets, feet in parentheis)

	(a.)/wiŋka/ 'foreigner'	(b.)/mawɨn/ 'rain'	(c.)/mawiθa/ 'woodland'	(d.)/atʃawaʎ/ 'hen'	(e.)/ŋe/ 'eye'
ExMtr	⟨wiŋ⟩.ka	⟨ma⟩.wɨn	⟨ma⟩.wi.θa	⟨a⟩.tʃa.waʎ	ŋe
footing	⟨wiŋ⟩.(ka)	⟨ma⟩.(wɨn)	⟨ma⟩.(wi.θa)	⟨a⟩.tʃa.(waʎ)	(ŋe)
surface	[wiŋká]	[mawɨ́n]	[mawíθa]	[atʃawáʎ]	[ŋé]

4.2.3.1 Language-internal motivation for initial extrametricality

Aside from the highly idiosyncratic differences in stress patterns of di- and trisyllabic words as first elements in compounds (cf. Table 4.5), the fundamental pattern that motivates the claim of initial extrametricality in our data is the lack of overt stress on initial syllables in words or stems of more than one syllable. Evidently, the only partial exception to this are disyllabic nouns with a final light syllable. The alternation in the position of stress in such forms, however, seems to point to the interaction of competing stress assignment systems at the lexical and post-lexical levels, which we will deal with in §4.4.1.

Of course, this lack of initial stress in polysyllables is precisely what seems to have motivated the widely propagated notion of Mapudungun having an iambic, quantity insensitive, left-to-right stress assignment system (cf. §2.3). As a matter of fact, if we consider only the leftmost word in compounds (as well as, perhaps, the verb stem) a system such as this could account for most of their stress-patterns quite efficiently: *(wiŋ.ká); (ma.wɨ́n); (ma.wí).θa; (ŋé)*. However, forms such as *a.tʃa.wáʎ* cannot be explained without appealing to some form of weight sensitivity (especially in contrast with *ma.wí.θa*). Even if this were not the case, however, an analysis based on quantity-insensitive iambs would lead to the very implausible generalisation that the language has two stress systems that differ in every possible parameter except end-rule right (cf.

Table4.6).

Table 4.6: Envisioned contrasting foot-types in first PrWds in compounds and other word categories

	Leftmost PrWd in compounds	Other word categories
Foot headedness	Iamb (right)	Trochee (left)
Weight Sensitivity	No	Yes
Direction of Parsing	Left-Right	Right-Left
End Rule	Right	Right
Iterativity	Yes	No

This state of affairs is unsatisfactory to say the least. From a processing standpoint, furthermore, stress assignment under these conditions would be an extremely costly endeavour. To this we may add the fact that there appears to be no clear justification in order to postulate that right- and left-edge words within compounds ought to behave differently.

Precisely this argument may be levelled against the initial-extrametricality account as well: If the domain of application of extrametricality is the word, then we would expect it to apply to the rightmost prosodic word as well as the leftmost. A quick glance at the surface forms in Table 4.3 (in particular, b and e) shows this not to be borne out. However, within the context of compounding as a cyclically built, recursive PrWd (as presented in 4.2),[7] we may assume that extrametricality only persists for the level where it is being applied. In this sense, extrametricality is applied twice to the leftmost syllable of the compound (i.e. in building both the subordinate and superordinate PrWd) and only once in the case of the second word (i.e. in the building of the subordinate PrWd). Where extrametricality is not applied to the second subword in Cycle 2, refooting of the word may occur.

[7]Although the case for cyclicity of stress assignment in Mapudungun is most clearly visible in the case of verbal stems cf. §4.3.2, the fact that compounds are undoubtedly made up of two PrWds requires us to justify the difference between the effects of footing and initial extrametricality on the two elements. Cyclicity provides one such explanation.

Table 4.7: Extrametricality and cyclic word building (extrametrical elements in angled brackets, feet in parentheses)

		a. /kuθi-foro/ ‘mortar-bone’	b. /fotiʎa-pulku/ ‘bottle-wine’
Word Cycle 1	EXTRAMETICALITY / FOOTING+STRESS	* * ⟨ku⟩.(θi) ⟨fo⟩.(ro)	* * ⟨fo⟩.(ti.ʎa) ⟨pul⟩.(ku)
Word Cycle 2	EXTRAMETICALITY / (RE)FOOTING+STRESS	* * ⟨ku⟩.θi+(fo.ro)	* * ⟨fo⟩.ti.ʎa+(pul).ku
SURFACE		[kuθìfóro]	[fotíʎapúlku]

The key theoretical implication here is that extrametricality is not preserved throughout the derivation, but that it applies to each relevant cycle independently, being lost (or erased) at the end of that cycle (as in Inkelas 1991, for example). For the case of compounds, however, erasure of extrametricality is not tantamount to erasure of the word boundary, as we have seen, the words within compounds preserve a degree of independence (in particular with regards to stress, cf. §4.2.1). We will return to this topic in §4.3.4.

4.2.3.2 Theoretical motivations for initial extrametricality

The status of left-edge extrametricality is highly embattled. Although in its inception, the notion of extrametricality was not restricted to a particular word edge (Lieberman & Prince 1977; Nanni 1977; Hayes 1979, 1982; Halle & Vergnaud 1987a), work over the past three decades (including Hayes 1995; Prince & Smolensky 1993) has shown that there is a clear preference for systems with final extrametricality, a characteristic of the phenomenon termed ‘edge-markedness’. A number of accounts take this further by simply excluding the left edge from the loci of application of extrametricality (Hyde 2001, 2002; Hyde et al. 2012; Kager 2005, 2012; Alber 2005).

The key issue is that the inclusion of initial-extrametricality – or OT NON-INITIALITY

– is claimed to over-generate the possible stress systems of the world's languages (cf. Hyde 2002; Altshuler 2009; Kager 2012). In particular, it is claimed that, although there are trochaic patterns where rightmost stress is two syllables removed from the edge (requiring the final syllable to be extrametrical), no mirror pattern of this distribution (i.e. an iambic pattern with initial syllable extrametricality) is attested. We exemplify this purported asymmetry with schematic representations of stress position in the language Pintupi and its mirror image Anti-Pintupi (purportedly unattested) using data cited in Hermans (2011: 982).

Table 4.8: Trochee (syllabic) with final extrametricality (Pintupi) vs. iamb (even) with initial syllable extrametricality (Anti-Pintupi – purportedly unattested)

Pintupi	Anti-Pintupi
x x x	x x x
(1 2) (3 4) 5 [6]	[1] 2 (3 4) (5 6)
x x x	x x x
(1 2) (3 4) (5 6) [7]	[1] (2 3) (4 5) (6 7)

Although we do not deny that there is an asymmetry in the frequency of occurrence of initial and final extrametricality, there is a growing body of evidence that seems to support the claim – if not to all possible factorial typological predictions – to initial extrametricality in some circumstances. Crucially, in terms of accounting for a language's metrical pattern, using initial-extrametricality is a much more viable option than the alternatives provided in the literature in terms of processing load and learnability (see, for example, the alternative in Mapudungun, given in Table 4.6). As a matter of fact, the basic stress pattern claimed for Kashaya stress (Oswalt 1961, 1988; Buckley 1992, 1994, 2009) represents no less than the supposedly unattested Anti-Pintupi pattern in Table 4.8 (albeit, with weight sensitivity). Such a pattern requires a much greater infrastructure in order to be explained in a different framework (Hyde et al. 2012).

(4.3) Default stress in Kashaya (Buckley 1992)

a. *li.(bu.tá:.)du* 'keep whistling'

b. *du.(k'i.lí:.)(tʃ'a.la)* 'point at yourself while going down!'

c. *tʃoh.(to.tʃí:.)(du.tʃe:.)du* 'keep going away!'

d. *ʔah.(qo.lá:.)(ma.da:.)(da.du)* 'to get longer and longer'

There are, however, a number of morphological facts about Kashaya that, at times, make this pattern opaque. One of these, as in the case of Mapudungun, is the fact that monosyllabic roots block extrametricality; another is that long vowels in certain contexts trigger foot extrametricality (cf. Buckley 1992, 1994, 2009). The type of opacity that we find in the Kashaya data is precisely the major limitation of many of the typological surveys of metrical structure: More subtle points of the interaction of prosodic and morphological structure are generally overlooked as such surveys are principally concerned with surface patterns, where uninterrupted sequences of rhythmically organised prominences can be readily identified without the incidence of morphology. This is precisely the case for the data for Mapudungun in Echeverría & Contreras (1965), as perpetuated in the literature: the quantity-insensitive iambic pattern is generalised, even when there are clearly weight sensitive alternations at the right edge (cf. §2.3) and a coincidence in the position of leftmost stress and the verbal stem edge.

The initial extrametricality approach has been used to deal with a number of more subtle facts about the organisation of word stress well beyond the scope of an extended stress-lapse at the left edge (cf. 4.8; 4.3). Although the examples for initial extrametricality are few and the data and analyses underlying them have often been challenged, the tool has been invoked to produce more elegant and feasible analysis of a number of languages, both synchronic and diachronically. Some examples of this are a number of accounts given for Winnebago (Hale & White Eagle 1980; Hayes 1980; Prince 1983; Halle & Vergnaud 1987a; Beasley & Crosswhite 2003), that of Kennedy (1994)

for Dakota, Kenstowicz (1994b) for Mari, Hualde (1999) for dialects of Basque, and Melinger (2002) for Seneca. It is our intention to include the data for Mapudungun within this growing tradition.

4.2.4 Formalisation of compound stress

With the new data thus structured, and armed with the analytical tools of initial-syllable extrametricality and right aligned moraic trochees, we are now in a position to account for the basic word-level patterns of Mapudungun nominal compounds. As a formalisation, we present the metrical rules in 4.4, and the sample derivations in Table 4.9.

(4.4) Stress Assignment in Compounds (rules apply to both PrWd levels):

1. Initial Extrametricality (ExMtr): Mark the leftmost syllable of a domain as extrametrical.[8]
2. Footing (Foot): Build moraic trochees aligned to right edge of the domain. Where a minimum of two moras are unavailable, build a single monomoraic foot at the stem level, but not at the word level.[9]
3. Prominence Assignment (Prom): Add a prominence mark to the heads of feet within the domain.

The issue of footing, however, must be clarified with respect to the different domains of rule application, since the 'availability' of moras is restricted to the domains each cycle can access. In the case of the cyclical application of footing at the word level,

[8]Importantly, although the rule of extrametricality applies cyclically to the PrWd domain, it cannot be applied to a syllable that has already been stressed in a previous level or cycle. This is key for cases with monosyllabic first elements such as head initial *tʃé.-mamíʌ* 'person-wood (totem pole)'.

[9]Note that footing assigned on a previous cycle is erased if it overlaps with the later cycle's footing. This means that a second prominence mark is not added where an identical foot is built on both cycles. If this were the case, all heavy final-syllable compounds would have main stress (i.e. two prominences) on the penultimate syllable. Of course, this is not true for cases where the compound is head-initial (cf. Table 4.3d).

re-footing may occur for a non-initial prosodic word when extrametricality is no longer in force (Cycle 2). This is precisely what we see in Table 4.9a. In Table 4.9b, however, the re-footing cannot apply across a PrWd boundary, regardless of the cycle where the rule is applied (i.e. the bracketing of words is not erased for the purposes of footing).

Table 4.9: Sample derivations for compound stress (initial extrametrical syllables in angled brackets, moraic trochees in parenthesis)

		(a.) /fotiʎa-pulku/ 'bottle-wine'	(b.) /warija-tʃe/ 'city-person'
Word Cycle 1	ExMtr / Foot / Prom	* * [⟨fo⟩.(ti.ʎa)]$_\omega$-[⟨pul⟩.(ku)]$_\omega$	* * [⟨wa⟩.(ri.ja)]$_\omega$-[(tʃe)]$_\omega$
Word Cycle 2	ExMtr / Foot / Prom	* * [[⟨fo⟩.ti.ʎa]$_\omega$[(pul).ku]$_\omega$]$_{\omega'}$	* * [[⟨wa⟩.ri.ja]$_\omega$[(tʃe)]$_\omega$]$_{\omega'}$
Surface		[fotíʎapúlku]	[waríjatʃé]

4.2.4.1 Prominence hierarchies and clash

An important issue that is not dealt with in the metrical rules in 4.4 is that of the hierarchical organisation of prominences within the compound. As is evident in the transcription we have adopted here, in unemphatic speech, the difference between the level of non-adjacent stresses in the two elements of compounds is not particularly evident. In the case where the two are immediately adjacent, however, there is a clear boost in the stress of the head-word. Although further evidence for this claim will come from the stress system of verbs, here we put forth the idea that there is a clash avoidance constraint in the language which promotes the head element's stress when it is adjacent to the dependant's stress. More generally, however, in emphatic speech it is observed that the head is also promoted, however, this is likely just the result of a more general crosslinguistic focus accenting tendency in language.

Since the rule that promotes head-stress in the context of clash is somewhat variable,

depending both on speech rate and style, we place it at the post-lexical level. This means that, at times, the rule will fail to apply, in particular in very slow, deliberate speech, where both prominences can be easily heard. However, in most cases in running speech, the rule will apply, giving only minimal evidence of the presence of the stress of the dependant element (see §4.5.2).

(4.5) Clash avoidance rule in compounds (post-lexical):

4. Clash avoidance (no-clash): In the context of two adjacent syllables bearing the same level of prominence, promote the head domain by adding a further prominence mark.

Table 4.10: Sample derivations for compound stress with clash avoidance (optional prominence marks in parenthesis)

		(b.)/kuθi-foro/ ‘mortar-bone’	(c.)/foro-tʃaɻwa/ ‘bone-fish’
Word Cycle 1	ExMtr / Foot / Prom	* * [⟨ku⟩.(θi)]$_\omega$ [⟨fo⟩.(ro)]$_\omega$	* * [⟨fo⟩.(ro)]$_\omega$ [⟨tʃaɻ⟩.(wa)]$_\omega$
Word Cycle 2	ExMtr / Foot / Prom	* * [[⟨ku⟩.θi]$_\omega$[(fo.ro)]$_\omega$]$_{\omega'}$	* * [[⟨fo⟩.ro]$_\omega$[(tʃaɻ)wa]$_\omega$]$_{\omega'}$
Post-lexical	no-clash	(*) * * [[⟨ku⟩.θi]$_\omega$[(fo.ro)]$_\omega$]$_{\omega'}$	(*) * * [[⟨fo⟩.ro]$_\omega$[(tʃaɻ)wa]$_\omega$]$_{\omega'}$
Surface		[kuθifóro] ∼ [kuθìfóro]	[forótʃaɻwa] ∼ [forótʃàɻwa]

4.2.5 Summary for stress in nominal compunds

The proposal in this section was based on the fact that Mapudungun nominal compounds appear to display a recursive PrWd structure. This organisation is helpful to our analysis as it allows us to explain the rather perplexing position of stress on the basis of two interacting rules: syllable-initial extrametricality and right-aligned moraic

trochee footing. The major strength of this analysis is that it relies on a single set of rules (and a single foot-type) in order to account for the distribution of stress, leaving the differences in the ultimate outcomes of these rules within each domain to their cyclic application.

Although we shall see that the domain of the word is able to erase the bracketing of previous levels (see 4.3.4 for the erasure of stem-bracketing at the word level), we noted here that the word-level rules do not modify word-level domain-boundaries regardless of the cycle of application, allowing, however, for foot-structure and stress to be re-assigned within them.

At the post-lexical level, prominence ambiguities in the context of clash are resolved by highlighting the morphosyntactic structure. The post-lexical domain is sensitive to speech rate and style, so there is a degree of optionality on the culminativity of compound stress.

In the next section we attempt to extend this analysis to verbs, taking into account the definitional fact that we are no longer dealing with recursive words, but with stems and suffixes which are unable to stand alone.

(4.6) Summary for nominal compound stress assignment (recursive PrWd analysis):

- Stress position:
  - Second element:
    - Stress falls on the penultimate mora.
    - Monomoraic monosyllables are also stressed.
  - First element:
    - Disyllables: stress the final syllable.
    - Trisyllables: Stress the penultimate mora.
    - Monomoraic monosyllables are also stressed.
- Analysis:
  - Cyclical PrWd building.
  - Right-aligned moraic trochee footing (degenerate feet allowed if coextensive with PrWd).

– Initial syllable extrametricality.
– Refooting of PrWds allowed in second cycle, but
– No footing across PrWd boundaries.

4.3 Stress assignment in verbs

In Chapter 3, the new fieldwork data for verbs was shown to fit in well with the right-edge moraic trochee pattern, while a second 'left-edge' window for stress assignment was seen to be more accurately conceived as falling on the final syllable of the stem. Briefly, we recall that this pattern was most obvious for forms where there was at least one intervening syllable between the right edge of the stem and the locus of the word's right-edge stress (i.e. the penultimate mora). We also recall that the structure of simplex stems (i.e. roots) in our data was always limited to either mono or disyllables, which could be extended through a limited number of derivational suffixes which had a strong tendency to bear stress (i.e. stem=root+stem extension suffixes).

With the new analytical tools developed for compounds, then, we may venture to assume that stem level stress for verbs behaves much in the same way as the leftmost stress of compounds: initial syllables are extrametrical (when stems are not monosyllabic) and moraic trochees (or in their place monomoraic feet) are footed at the right edge. What must be examined in particular for verbs, however, is the role of stem extensions in this process and, furthermore, the ultimate interaction of right- and stem-edge stress.

4.3.1 Patterns of stress interaction

As noted in the examples in §3.4.2.3, the realisation of immediately adjacent stem and word edge-stresses is rare.[10] In most cases they either do not interact or simply coincide. Clearly, there are also a number of cases where we would expect stem-final[11] and word-edge stress to share a syllable boundary, but instead, one of the two stresses is conspicuously missing. It seems, therefore, that at some level of the phonology of Mapudungun verbs there are clash-avoidance rules in operation.

Table 4.11: Patterns of STEM (S) and WORD (ω) stress interaction (see 3.28, p. 164 – stressed syllables underlined, optional syllables in parenthesis)

	Structure	Pattern	N	Percentage
a.	$[[(\sigma)\ \underline{\sigma}]_{\text{S}}\ \sigma_1\ \underline{\sigma}(\sigma)]_\omega$	No interaction	114	(40.4%)
b.	$[[(\sigma)\ \underline{\sigma}]_{\text{S}}(\sigma)]_\omega$	Conflation	68	(24.1%)
c.	$[[(\sigma)\ \underline{\sigma}]_{\text{S}}\ \underline{\sigma}(\sigma)]_\omega$	Clash	10	(3.5%)
d.	$[[(\sigma)\ \underline{\sigma}]_{\text{S}}\ \sigma(\sigma)\ ]_\omega$	WORD de-stress	38	(13.5%)
e.	$[[(\sigma)\ \sigma]_{\text{S}}\ \underline{\sigma}(\sigma)]_\omega$	STEM de-stress	52	(18.4%)

As is evident from the patterns of clash avoidance, neither option (STEM or WORD de-stressing) seems to have an overall preponderance, even if the numbers do favour STEM de-stressing by a small margin. As we shall see, the issue is more complex, since we must take into account both lexically specified stress and root-extension patterns.

4.3.1.1 No interaction

Aside from being the most common pattern in our data, this appears also to be the default. In the absence of direct adjacency of the two stress-assignment systems, both stresses surface.

[10] To the fact that stress-clash is a rare phenomenon, we may add that it is found in the slowest, most deliberate articulations mostly in the two speakers within our sampling with the slowest speech rates. Furthermore, a number of the forms have consonant-final nominal roots, which would be invariably stressed on the final syllable (cf. *miɨ́pun-* 'soot', *kuθaw-* 'work/job').

[11] The cover term 'stem' is used to refer both to simplex (roots) and complex (derived roots) morphemes. No implication is made regarding the free-standing nature of either morpheme.

(4.7) No interaction: STEM (S) and WORD-edge (ω) stress realised with at least one intervening syllable:

a. [[ɨ.ʈʂɨ́f.]$_S$-tu.-pu.-ke.-lá-n]$_\omega$
throw-REST-TRLOC-HAB-NEG-IND.1S

b. [[léf.]$_S$-pu.-lé-j]$_\omega$
run-TRLOC-PROG-IND.3

4.3.1.2 Conflation

This pattern, though already prevalent when dealing with the coincidence of root-stress (i.e. underived stem stress, cf. 4.8a,b) and word-edge stress, is even more common when we consider complex stems (i.e. root+stem-extensions) as well (cf. 4.8c,d). Although we have termed this pattern 'conflation' it is also possible to see it as one of the two stress systems overriding the other. These forms alone, however, cannot resolve the issue (but see §4.3.4).

(4.8) Conflation: STEM (S) and WORD -edge (ω) stress realised on same syllable:

a. [[mo.ŋé]$_S$-n]$_\omega$
live-IND.3

b. [[mo.ŋé]$_S$-j.-m-i]$_\omega$
live-IND-2-S

c. [[[le.li]$_S$-ŋé]$_S$-j]$_\omega$
watch-PASS-IND.3

d. [[[tu.ku]$_S$-ŋé]$_S$-j-u]$_\omega$
put.in-PASS-IND.1-D

4.3.1.3 Clash

There is a small number of cases of CLASH where we find final-stressed stems in direct adjacency with a stressed penultimate mora. Interestingly, such cases are found in alternation with stem-destressing forms.

(4.9) Clash: stem-final and penultimate mora stress (no resolution):

a. [[ke.ʌ́ú]$_S$-kí-j]$_\omega$
help-HABIT-IND.3

b. [[a.mú]$_S$tú-j]$_\omega$
go-REST-IND.3

4.3.1.4 Word-final de-stressing

The inclusion of forms with stem-extensions in this category is crucial. Forms lacking stress on a final moraic trochee are those where the head of the foot is immediately adjacent to either an extended (i.e. derived) stem (cf. 4.10c,d), or to a root with fixed stress (cf. 4.10a,b). These two types of left-edge stress can be considered to have a stronger claim to main stress than the right-edge stress.

(4.10) Right edge de-stressing: Lexically stressed roots and derived stems

a. [[ʈ̪ipá]$_s$-la-j]$_\omega$
exit-NEG-IND.3

b. [[θewmá]$_s$-fi-j]$_\omega$
build-DIR.3SP-IND.3

c. [[[elu]$_s$-ɲmá]$_s$-fi-j]$_\omega$
give-APPL-DIR.3SP-IND.3S

d. [[[pi]$_s$-ɲé]$_s$-fu-j]$_\omega$
say-PASS-BI-IND.3

4.3.1.5 Stem de-stressing

Finally, in a fair amount of cases, when a syllable with predicted stem-stress is adjacent to the head of a final moraic trochee, the stem tends to lack stress. This pattern occurs only in the case of monomorphemic stems (i.e. roots), and in particular where these do not appear to have lexically specified stress, representing a more 'default' clash-avoidance pattern. Note however, that such forms may alternate with those where clash is tolerated (cf. 4.9).

(4.11) Stem de-stressing: Roots lacking lexically specified stress:

a. [[a.mu]$_s$-lá-j-mi]$_\omega$
go-NEG-IND.2S

b. [[a.mu]$_s$lé-j]$_\omega$
go-PROG-IND3

4.3.2 Cyclic stem building and clash avoidance

Although we have seen that verbs bearing both STEM and WORD-level stress are most common, the lack of one or the other stress is by no means unexceptional. Aside

from some very isolated items, the key reason for the absence of one stress is its clash with the other. Abstracting away from the derived roots (polymorphemic stems) and roots with lexically specified stress, there is a robust pattern for the cases of stress clash: word-stress (i.e. right-edge stress) wins out, taking main stress, while the root appears unstressed or stressed to a different degree. In a few cases, however, we find no clash resolution whatsoever (note that the second level of prominence in 4.12b is in parenthesis, indicating that sometimes it is not present).

(4.12) Word-level vs. underived-stem stress in contexts with (a.) and without clash (b.). Optional promotion of stress in parenthesis.

		(∗)			
		∗ ∗			∗ ∗
a.	[[tuku]$_S$-fú-⟨j⟩]$_\omega$		b.	[[tukú]$_S$-la-fú-⟨j⟩]$_\omega$	
	‘place-BI-IND.3’			‘place-NEG-BI-IND.3’	

When the stem-domain is extended with the addition of a ‘stressed’ suffix, stress on the final syllable of the stem becomes practically unexceptional.[12]

(4.13) Word-level vs. derived-stem stress in contexts with (a.) and without clash (b.).

		∗			∗
		∗ ∗ ∗			∗ ∗ ∗
a.	[[[tuku]$_S$-ŋé]$_S$-fu-⟨j⟩]$_\omega$		b.	[[[tuku]$_S$-ŋé]$_S$-la-fu-⟨j⟩]$_\omega$	
	‘place-PASS-BI-IND.3’			‘place-PASS-NEG-BI-IND.3’	

In order to capture the main stress differences found in verbs with simplex stems (i.e. roots, cf. 4.12) and polymorphemic ones (cf. 4.13), a surface algorithm would need to be highly idiosyncratic. It would require main stress peaks to align with the right edge of the word in some cases, and in other cases, with stem-final syllables. It would further need to stipulate the preponderance of word level stress as optional and that of the stem as fixed. The need for such unlikely rules in a surface account are proof that stress assignment in Mapudungun displays features of what has been termed ‘procedural morphosyntactic conditioning’ of phonological processes (cf. Scheer 2008).

[12]See 3.58 and Table 4.14 for cases of fixed stress upholding root stress in the context of ‘stressed’ suffixes.

This means that for cases such as Mapudungun stress 'morphosyntax directly controls the amount of structure visible during a given round of phonological computation' (Bermúdez-Otero 2011: 2019), a state of affairs that presents important obstacles to surface approaches to phonological analysis (cf. Kiparsky 2000; Bermúdez-Otero 2011).

In line with what has been claimed for compounds, it is proposed here that an analysis where stress is assigned in tandem with word-formation processes can give a much less puzzling picture than that of the surface-only approach. In particular with reference to cyclic stem formation and clash-avoidance, a Lexical Phonology (Kiparsky 1982, 1985; Mohanan 1985) approach is particularly illuminating.

If we consider that stem-stress applies cyclically according to the same footing and prominence algorithm, and that clash is resolved in favour of the superordinate domain, then the prediction that the stem extension is consistently stressed to a greater degree than the underived stem and the word's right edge falls out naturally. Once again, although it would be possible to have a simple right-edge rule for stems, this would not fit in with the proposed analysis for the rest of the grammar. Following the moraic trochee analysis – alongside syllable initial extrametricality – allows us to describe a learnable grammar where similar patterns are instantiated within different word categories and morphological domains. In other words, some degree of 'metrical coherence' is argued for in the language (cf. Dresher & Lahiri 1991, and §8.2)

(4.14) Example derived and underived stem-domain stress:

UNDERIVED-STEM	>	DERIVED-STEM CLASH (unresolved)	>	DERIVED-STEM CLASH (resolved)
				*
*		* *		* *
a. $[\langle tu\rangle.(ku.)]_s$		b. $[[\langle tu\rangle.(ku.)]_s\text{-}(ŋe.)]_s$		c. $[[\langle tu\rangle.(ku.)]_s\text{-}(ŋe.)]_s$
'place-'		'place-PASS'		'place-PASS'

Recall that in compounds, a Cycle 2 PrWd domain rule cannot foot a moraic trochee across a subordinate (Cycle 1) PrWd boundary, in which case the system must resort to a monomoraic foot. The same can be said for stems: Cycle 2 rules cannot override the stem-boundary of Cycle 1. Therefore we never get cases such as *[[tu.(ku.]$_s$-ŋe)-]$_s$ in 4.14, where a right-aligned moraic trochee overrides the stem boundary, leaving the stem-extension unstressed.

(4.15) Verbal stress with moraic trochees (in parenthesis) and initial syllable extrametricality (in angled brackets):

a. [[⟨i̱⟩(ʦ̱ɨ́f)]$_s$-tu-pu-ke-(lá-n)]$_\omega$
throw-REST-TRSOC-HABIT-NEG-IND.1S
'I usually do not throw x in'

b. [[⟨we⟩(ŋé)]$_s$-tu.-(á.-j-u)]$_\omega$
steal-REST-FUT-IND-1-D
'we$_D$ will steal again'

c. [[[⟨tu⟩(ku)]$_s$](ŋé)]$_s$-la-(fú-j)]$_\omega$
place-PASS-NEG-BI-IND.3
'you will not place x'

d. [[(léf)]$_s$-pu-(lé-j)]$_\omega$
run-TRLOC-PROG-IND.3
'you are running there'

We note that in the account we give here, metrical structure may be assigned to an underived environment (i.e. the underived stem or root), as is explicitly allowed in (Kiparsky 1982, 1985) for non-structure-changing rules. In other words, since footing and prominence assignment in Mapudungun are non-contrastive, they are permitted to apply not only sub-lexically, but also before word-formation processes. The non-structure-changing nature of Foot and Prom (cf. 4.4) should also imply that their application in underived environments does not trigger a phonological cycle.

4.3.3 Formalisation of verbal stress

Our account for verbs, therefore, follows that given for nominal compounds in terms of the application of ExMtr, Foot and Prom to the level of the stem (cf. 4.4). In order to deal with clash in the context of the stem level, however, the no-clash rule from compounds is not particularly useful, as it applies post-lexically, having gradient effects rather than the categorical ones we find in the case of stem-extension stress. Furthermore, the rule is couched in terms of headedness relations rather than in terms of cyclicity and word-building hierarchies.

The metrical-rules applying to the stem level are given in 4.16 and exemplified in 4.17. We note that the first three rules are identical to those given for compounds (in 4.4), while the last one is a reformulation of no-clash in compounds (cf. §4.5) stated in broad enough terms so as to be applicable both to the stem and to the post-lexical levels.

(4.16) Stress Assignment in Verbs (rules apply to the stem level):

1. Initial Extrametricality (ExMtr): Mark the leftmost syllable of a domain as extrametrical.
2. Footing (Foot): Build moraic trochees aligned to right edge of the domain. Where a minimum of two moras are unavailable, build a single monomoraic foot at the stem level, but not at the word level.[13]
3. Prominence Assignment (Prom): Add a prominence mark to the heads of feet within the domain.
4. Clash Avoidance (no-clash): In the context of two adjacent syllables bearing the same level of prominence, promote either the superordinate or

[13]The 'available' moras in the case of the stem are only those corresponding to the material added in the relevant cycle. In other words, the footing assigned at a previous cycle, to a subordinate stem domain, is never re-footed.

head domain by adding a further prominence mark to the head of the root belonging to it.

(4.17) Example derived and underived stem-domain stress assignment:

Cycle 1: UNDERIVED		Cycle 2: DERIVED	
EXMTR; FOOT; PROM	FOOT; PROM	NO-CLASH	
			*
*	* *	*	*
a. $[\langle tu\rangle.(ku.)]_s$	b. $[[\langle tu\rangle.(ku.)]_s\text{-}(ŋe.)]_s$	c. $[[\langle tu\rangle.(ku.)]_s\text{-}(ŋe.)]_s$	

Note that the rules will assign final stress to disyllabic stems, either in the form of a closed syllable (a full moraic trochee – see 4.15a, above) or an open one (a degenerate monomoraic foot – see 4.15b,c above). This is a result of the interaction of EXMTR and FOOT at the level of the stem. The initial syllable will only be stressed in the case of monosyllables (cf. 4.15d), where the extrametricality constraint is overridden.

The hierarchy of prominences between stem and word stress easily falls out from the NO-CLASH rule's application at the stem and post-lexical levels. Here we examine these effects in underived and derived stems.

4.3.3.1 Verbs with underived stems

In the no-interaction cases (§4.3.1.1) there is no clash at either level, since there is always a syllable intervening between stem and word-stress. In such cases both stresses are realised at the same prominence level (cf. Table 4.12a).[14] In the cases of stem de-stressing (§4.3.1.5) – which we recall included only underived stems – it is crucial that the rules of word stress follow those of stem stress,[15] yielding a clash that cannot be resolved at the lexical level, but must wait until post-lexical rules are enforced. As

[14]The only exceptions to this are derived stems that have an intervening syllable between the stressed suffix and the penultimate mora of the word (e.g. *tu.ku.-ŋé.-la.-fù-j* 'put.in-PASS-NEG-BI-IND.3'), and lexically stressed stems at least one syllable removed from the penultimate mora (e.g. *θew.má.-ka.-kì-j* 'build-CONT-HABIT-IND.3').

[15]These rules, of course are identical except for NO-CLASH, which cannot apply to underived stems.

a result, the asymmetry in prominence hierarchy tends to favour the superordinate domain, but is subject to factors such as speech rate and style (cf. Table 4.12b).

Table 4.12: Sample derivations for verbal stress (underived stems, no-interaction and stem 'de-stressing')

		(a.)/nien-tu-pa-j-m-i/ have-REST-CIS-IND-2-S	(b.)/amu-la-j/ give-FUT-IND.1
STEM	EXMTR; FOOT; PROM	* ⟨ni⟩.(en)	* ⟨a⟩.(mu)
WORD	EXMTR; FOOT; PROM	* * ⟨ni⟩.en.tu.(paj).mi	* * ⟨a⟩.mu.(laj)
POST-LEXICAL	NO-CLASH	* * ni.en.tu.paj.mi	(∗) * * a.mu.laj.
SURFACE		[niéntupájmi]	[amuláj] ∼ [amùláj]

4.3.3.2 Verbs with derived stems

Recall that forms with word-final de-stressing have either derived or lexically stressed stems (cf. §4.3.1.4). Here, we deal with the derived forms, wherein the primacy of stem level stress is decided by the application of the FOOT, PROM and NO-CLASH rules in Cycle 2 (cf. 4.16). Because this occurs within a lexical stratum, stress cannot be gradient or susceptible to contextual or speech-rate factors. This contrasts with the primacy of word-level stress in Table 4.12b, which is subject to such factors, since NO-CLASH applies to the post-lexical level.

In the forms presented in Table 4.13 we note that the word level stress rules can only assign a single prominence level, while a second level of prominence has already been assigned to the stem. This ensures that the prominence of the derived stem will always outrank that of the right word-edge.

Table 4.13: Sample derivations for verbal stress (derived stems)

		(a.)/je-ɲma-j/ wear-APPL-IND-3	(b.)/tuku-ŋe-fu-j/ put.in-PASS-BI-IND-3
STEM Cycle 1	EXMTR; FOOT; PROM	* (je)	* ⟨tu⟩.(ku)
STEM Cycle 2	EXMTR; FOOT; PROM NO-CLASH	* * * jeɲ.(ma)	* * * ⟨tu⟩.ku.(ŋe)
WORD	EXMTR; FOOT; PROM	* * * jeɲ.(maj)	* * * * ⟨tu⟩.ku.ŋe.(fuj)
POST- LEXICAL	NO-CLASH	—	—
SURFACE		[jeɲmáj]	[tukuŋéfuj]

Since all the stem-extension suffixes (cf. §3.4.3.1) are monosyllabic (where they are not syllabified with the preceding root, cf. *-(i)m*, *-(i)l*), they receive stress either as full trochees (*-im*, *-el*) or as defective monomoraic feet (*-ɲma*, *-ŋe*, *-pe*). As proposed in §4.3.2, the interaction of the two stresses is resolved in favour of the superordinate domain (the derived root), a pattern only absent in the cases where the root is lexically stressed (cf. 4.14).

4.3.3.3 Verbs with fixed stem stress

As mentioned above (cf. §4.3.3.2), verbs with fixed stem stress make up an important part of the data for the 'final-destressing' pattern. In such cases, we assume there is a prominence mark in the lexically stored item. The application of the metrical rules in 4.16 places an additional * to its column in the grid. We note, however, that the lexical mark may be variable for some words, as in the contrast between Table 4.14 a and b. Again, this might be a residue of the root's diachronic trajectory and degree of

lexicalisation (cf. fn. 36).

The derivation in Table 4.14c also shows a different pattern, which is that of the interaction of lexically stressed stems, stem-extension stress and word-level stress. As shown in Chapter 3 (3.52; 3.58), this is one of the major exceptions to undominated derived stem stress. Here the pattern of stress on the final syllable of the underived stem wins out, although word-level stress may be promoted to its same level within the post-lexical phonology.

Table 4.14: Sample derivations for fixed-stress roots

		* (a.)/ʈʂipa-la-j/ 'exit-NEG-IND.3'	(b.)/ʈʂipa-la-j/ 'exit-NEG-IND.3'	* (c.)/θewma-ŋe-ki-j/ 'build-PASS-HABIT-IND.3'
STEM: Cycle 1	EXMTR; FOOT; PROM	* * ⟨ʈʂi⟩.(pa)	* ⟨ʈʂi⟩.(pa)	* * ⟨θew⟩.(ma)
STEM: Cycle 2	EXMTR; FOOT; PROM NO-CLASH	—	—	* * * ⟨θew⟩.ma.(ŋe)
WORD	EXMTR; FOOT; PROM	* * * ⟨ʈʂi⟩.pa.(laj)	* * ⟨ʈʂi⟩.pa.(laj)	* * * * ⟨θew⟩.ma.ŋe.(kij)
POST-LEXICAL	NO-CLASH	* * * ʈʂi.pa.laj	(*) * * ʈʂi.pa.laj	* (*) * * * θew.ma.ŋe.kij
Surface		[ʈʂipálaj]	[ʈʂipaláj] ∼ [ʈʂipáláj]	[θewmáŋekíj] ∼ [θewmáŋekij]

4.3.4 Word vs. stem level in verbs

The stress patterns for verbal stems present us with a crucial fact for differentiating the stem and the word level, beyond the question of their ability to stand alone. This difference regards the interaction of the word and stem level, as opposed to the interaction of the two cycles of word formation in compounds. While we find that compounds

with a second subordinate PrWd made up of a single syllable must assign stress to it, verbs with a final light non-stem (inflectional) syllable need not. From the perspective of the analysis we present here, this means that the PrWd level in Mapudungun may override stem stress assignment, but may not override the PrWd boundaries in reassigning stress. In short, although the boundaries are preserved across cycles within the stem (cf. p. 191) and word levels (cf. p. 183), they are erased across levels.

Note that in Table 4.15a the final syllable of the stem is assigned a foot even though it is monomoraic. In the same example, a degenerate foot cannot be built at the right edge of the word, following Rule 2 in 4.16. As a result, the final open syllable remains unfooted, receiving no stress. In the case of the compound in Table 4.15b, the second subordinate PrWd is footed, even when it generates a monomoraic foot. This responds to two trends in the language: that all PrWd words must receive stress, and that a final foot cannot be parsed across the word-boundary (i.e. *$wari(já.\text{-}tʃe)_{\mu\mu}$).

Table 4.15: Sample derivations for 'conflated' and 'non-conflated' stress in verbs and compounds – trochaic analysis with initial syllable extrametricality

		(a.)/tʃoju+I+m+I/ 'bear-IND-2-S'	(b.)/warija+tʃe/ 'city-people'
Stem Cycle 1	syllab, prominence	* $[\langle tʃo\rangle.(ju)]_s$	—
Word Cycle 1	resyllab, prominence,	—	* * $[\langle wa\rangle.(ri.ja)]_\omega$+$[(tʃe)]_\omega$
Word Cycle 2	resyllab, prominence	* $[\langle tʃo.\rangle(juj).mi]_\omega$	* * $[[\langle wa\rangle.(ri.ja)]_\omega[(tʃe)]_\omega]_\omega$,
Post-lexical	epenthesis, no-clash	—	—
Surface		[tʃojújmi]	[waríjatʃé]

The difference between the sub-lexical (stem) and the lexical (PrWd) levels is also marked by the fact that culminativity seems to be more strictly enforced on the former than on the latter. While stress-clash is always resolved at the stem level, there is some optionality at the level of the word. Here the key is understanding that the word-level

phonology of Mapudungun – in particular FOOT and PROM – is part of the lexical module, being sensitive to the stress at the previous levels, as well as to the word-edge restriction on stressing a final open syllable. On the other hand, NO-CLASH must happen after the syntactic component, making it sensitive both to syntactic structure and to speech rate and style factors (cf. Booij & Rubach 1987).

4.3.5 More on verbal prosody: syllabification, epenthesis and beyond

4.3.5.1 Syllabification and resyllabification

Another important characteristic of word-level phonology in Mapudungun verbs is resyllabification. This means that the original syllabic structure parsed over the stem-domain may be altered at the word-level. In particular, the /j∼i/ alternation seems to be conditioned not only by elements within the word-level morphology (i.e. inflection) but also by the structure of stem-level morphology. Recall that we have claimed that front high sonorants, underspecified for syllabicity (/I/), mark the indicative, the first person and the singular, surfacing as vowels where they are not immediately adjacent to a consonant or word edge, and as glides where they are able to create a valid onset or coda (cf. 3.18, p. 120).

(4.18) Syllabification rule for Mapudungun (active at all levels):

5. SYLLABIFICATION (SYLLAB):

a. Parse a domain into syllables from left to right. Create nuclei using no more than one vocalic segment. In a series of consonants, prioritise the creation of a mono-segmental onset. Remaining consonantal material may be syllabified in the coda.

b. For the case of high sonorants underspecified for syllabicity (in particular

/j∼i/ or ⟨I⟩), parse as a nucleus when the sonorant is not directly adjacent to another nucleus. In a series of more than one underspecified element, parse the first as a nucleus when following a consonant and as a glide when following a nucleus. In the latter case, delete all following homorganic sonorants if word-final or followed by a vowel (/C-I-I/ > [Cij]; /V-I-I/ > [Vj]).

The crucial contexts that we examine are those of consonant and vowel-final stems contrasting as regards the independence or 'conflation' of the stem- and word-level stresses.

Table 4.16: Word-level resyllabification (/I/ = underspecified high-front sonorants):

		(a.) /tʃo.ju-I-m-I/ 'bear-IND-2-S'	(b.) /kon-I-I-u/ 'enter-IND-1-D'	(c.)ʈ͡ʂipa-I-I 'exit-IND-3'
STEM	SYLLAB; EXMTR; FOOT PROM	* ⟨tʃo⟩.(ju)	* (kon)	* ⟨ʈ͡ʂi⟩.(pa)
WORD	SYLLAB; EXMTR; FOOT PROM	* ⟨tʃo⟩.(juj).mi	* * ko.(ni.ju)	* ⟨ʈ͡ʂi⟩.(paj)
POST-LEXICAL	NO-CLASH	—	(*) * * ko.ni.ju	—
SURFACE		[tʃojújmi]	/[koníju] ∼ [kóníju]	[ʈ͡ʂipáj]

Resyllabification at the word level clearly affects the position of stress in relation to the right edge of the word. The form in Table 4.16a does not surface as */tʃo.jú.í.mi/, as one might expect if the syllabification of the stem remained intact, but rather displays the effects of word-level resyllabification overriding the previous level's (i.e. the stem's) parsing.

4.3.5.2 Glide deletion

At the post-lexical level, it is likely that there is an additional rule of glide deletion, not dissimilar from the vowel deletion rule proposed by Rivano (1990, see §3.4.1.1 and 3.13). In this case, the rule would only apply after all stress assignment rules have taken place and would affect, in particular, word-final glides in homorganic sequences of unstressed syllables. Hence, we account for the 'ambiguous final segment' verbs (cf. §3.4.1.2) which – although expected to have a final homorganic vowel-glide sequence underlyingly –appeared to lack both the final glide and predicted stress on a final closed syllable.[16]

(4.19) Examples of final glide deletion in unstressed syllables:

a. *kɨpá-l-i(j)*
come-CAUSE-IND.3
'He brings x'

b. *l̪aŋ-ɨ́m-i(j)*
'die-CAUSE-IND.3'
'He killed x'

c. *t̪s̪ipá-ki(-j)*
'exit-HABIT-IND.3'
'He usually left'

In our analysis, lack of stress is not the result of the lack of a final glide, but rather, main stress is assigned to derived or lexically stressed stems and, where the final syllable lacks stress, it becomes vulnerable to glide deletion. As a post-lexical rule, final glide deletion is gradiently applied. A consequence of this process, of course, is the surface-truth of the moraic trochee aligned to the right edge of the word.

[16]The rule is formalised in §4.5.1.2.

4.3.5.3 Epenthesis

Another candidate for the post-lexical phonology of Mapudungun is vowel epenthesis, which does not play a part in stress assignment, and is also applied relative to speech rate and style. In our data, this epenthesis breaks up a word final coda with more than two successive consonants. In particular this is relevant to the second person plural marking in the indicative (for more on PDM epenthesis see §1.5 and §5.5.3).

(4.20) Epenthesis: Optionality and non-interaction with stress assignment

/wɨl-a-I-m-n/ → [wɨlájmɨn] ∼ [wɨlájmn] (but not *[wɨlajmɨ́n])

give-FUT-IND-2-P

4.3.6 Summary for stress in verbs

We have seen, then, that the data for verbs seem to support a single set of stress-assignment rules which are applied cyclically within the domain of the STEM, the PRWD and, finally, at the post-lexical level. Three of these rules (EXMTR, FOOT and PROM) were known to us from the analysis of compounds. Applied to the underived stem and to the word level they produce the basic pattern of verbs: stem-final stress and penultimate mora stress. When these two stresses were not adjacent, they presented as hierarchically identical; however, to deal with their adjacency, the NO-CLASH rule was reformulated to promote the superordinate (word) domain.

Applied cyclically to to the stem, these rules produced adjacent prominences between the basic stem and its extensions. By the application of the new version of NO-CLASH, the superordinate stem level was promoted to a degree where word level stress could no longer override stem stress. The result is a system where derived stems are undominated in terms of stress and where word stress usually outranks underived stem stress. The gradient nature of word-dominance and the categorical nature of

derived stem dominance was explained through the locus in the derivation where the NO-CLASH rule was applied.

(4.21) Summary for verbal stress assignment (STEM and PRWD levels):

- Stress position
  - PRWD-level stress:
    - Stress is on the penultimate mora.
  - Stem-stress:
    - Stems are roots + optional stem-extending suffixes.
    - The final syllable is stressed (only mono and disyllabic roots).
  - Interaction:
    - Both stresses are realised at the same level unless directly adjacent.
    - Lexically stressed and derived stems bear main stress if immediately preceding the word-level stress.
    - In underived stems, the word level takes main stress if adjacent to stem-stress.
- Analysis
  - Cyclical stem building:
    - Right-aligned moraic trochee footing (degenerate feet allowed).
    - Initial syllable extrametricality.
    - No stem-level footing across previous stem boundaries.
    - NO-CLASH promotes superordinate stem stress.
  - Word-stem interactions:
    - Derived and lexically stressed stems always bear primary stress.
    - NO-CLASH promotes stress assigned at the PRWD level when adjacent to underived-stem stress.

4.4 Further applications of Mapudungun stress rules

The core set of rules provided as the result of the analyses in the previous section can be extended to try to deal with some persistent difficulties as regards the data both in this study's original fieldwork and within previous work on the language. The most prominent of these issues is, of course, that of disyllabic nouns with a final open syllable, where stress alternates widely both within and across speakers and contexts.

The second issue is that of adjectival and adverbial stress, which is consistently stress-final and presents some additional difficulties in order to fit in with the overall stress assignment system in the language.

4.4.1 Disyllabic nouns revisited

As shown in §4.1, a trochaic analysis fits the data for monomorphemic nouns best, in particular as regards trisyllables and disyllables with final closed syllables. The alternation of stress position in Mapudungun disyllables with final open syllables, however, remains one of the most enigmatic facts in the language's stress system. A closer look at the interaction of extrametricality and footing in nominal forms is given in this section, providing a plausible reason for the alternation in vowel-final disyllables.

In the non-alternating forms (trisyllables and consonant-final disyllables), the question of initial syllable extrametricality is moot, as no footing is proposed for initial syllables to begin with. In this sense, extrametricality could be considered to apply vacuously.

(4.22) No interaction of extrametricality and footing in nouns: trisyllables and disyllables with a heavy-final syllable (moraic trochees in parenthesis)

a. ⟨ku⟩.(ʈ̪sán) 'disease' b. ⟨lam⟩.(ŋén) 'sister' c. ⟨ma⟩.(wí.θa) 'woodland' d. ⟨a⟩.tʃa.(wáʌ́) 'hen'

In §1.2.2 it was noted that the Mapuche noun is never inflected. All lexical rules for underived nouns, therefore, must apply on a single level. We assume this level to be the final lexical level, that is, the first PrWd cycle. Although in the examples in 4.22, ExMtr and Foot do not overlap, where disyllables end in an open syllable, they must. As the head of the moraic trochee is banned from the first syllable, it would be assumed that a final degenerate foot would be parsed, as in the case of monomoraic PrWds within compounds (cf. 4.9). Crucially, a second cycle at the

PrWd level cannot change this output, since the exact same rules apply to the very same structure.

Table 4.17: Monomorphemic nouns with final open syllables: Word level

		(a.)/wiŋka 'foreigner'	(b.)/mapu/ 'land'
Word	extrametric, prominence	* [⟨wiŋ⟩.(ka)]$_\omega$	* [⟨ma⟩.(pu)]$_\omega$
Surface		$^{(*)}$[wiŋká]	$^{(*)}$[mapú]

Clearly, this output is not completely surface true, since we know vowel-final disyllables alternate stress (note the asterisks in parenthesis at the surface level). Such fluctuation in the position of main prominence in Mapudungun words, as we have seen elsewhere (Tables 4.12, 4.16, and 4.2.4.1, etc.), tends to be the result of the interaction of word and post-lexical level rules, in particular, with regards to no-clash. In this case, however, we find that there is only one stress at the lexical level, so there is no resolution needed. The issue here seems to be related not to no-clash, but to ExMtr, since, where the head of a word-level trochee is not left-aligned, alternation ceases to be an issue. Such is the case, of course, for trisyllables and heavy-final disyllables (cf. 4.22), but also for derived nouns taking monomoraic suffixes (both from nominal stems and verbal roots 4.23).

(4.23) Derived nouns and stress position:

a. *ku.rá* ∼ *kú.ra*
stone
'stone'

b. *ku.rá.-we* ∼ **kú.ra.-we*
stones-PLACE
'place of stones'

c. *wej.tʃá-n*
fight$_V$-NOM
'a battle, war'

d. *wej.tʃá-fe* ∼ **wéj.tʃa-fe*
fight$_V$-AGENT
'fighter, worrier'

If the key issue is the application of extrametricality, we may claim that, at the post-lexical level, moraic trochees are footed (i.e. Foot and Prom are active) with-

out applying extrametricality. Of course, elsewhere in the grammar (where footing and extrametricality do not interact at the final lexical level), such a rule simply reinforces the same output as the word level, but in the case of light-final disyllables, this would produce initial stress. Furthermore, if FOOT and PROM are applied optionally – dependent on factors such as speech rate and register – stress on light-final disyllables may follow either the lexical level (final) or the post-lexical (penultimate).

Table 4.18: Monomorphemic nouns with final open syllables: Optional post-lexical level footing

		(a.)/wiŋka/ 'foreigner'	(b.)/mapu/ 'land'
WORD	EXMTR; FOOT; PROM	* [⟨wiŋ⟩.(ka)]$_\omega$	* [⟨ma⟩.(pu)]$_\omega$
POST-LEXICAL	FOOT; PROM	* [(wiŋ).ka]$_\omega$	* [(ma.pu)]$_\omega$
SURFACE		[wíŋka] ∼ [wiŋká]	[mápu]∼[mapú]

A possible explanation for the alternation in disyllabic stress can, therefore, be proposed by extending the footing and stress assignment algorithm of the lexical levels to the post-lexical phonology, where initial extrametricality does not apply.

4.4.2 Stress assignment in adjectives and adverbs

An interesting piece of data that we put forth here[17] has to do with the position of stress in disyllabic adjectives and adverbs. The fact that nouns are uninflected – and therefore have a single lexical level in underived forms – contrasts in particular with adjectives, which are inflected for the non-singular (by adding the suffix *ke* – cf. §1.2.2.2) and must therefore have at least two lexical levels. Interestingly, in all forms of adjectives[18] – inflected and uninflected – stress falls on the final syllable of the STEM.

[17]Data for this section, though not gathered systematically, are fully coherent with most previous work on the language.

[18]We have only monosyllables and disyllables in our data.

(4.24) Stress in Mapudungun adjectives, singular and plural:

a. *pi.tʃí* *tʃe* ∼ *pi.tʃí.-ke* *tʃe*
small-P person small person
'child' 'children'

b. *ŋɨ.fór* *ma.kuɲ* ∼ *ŋɨ.fór.-ke* *ma.kuɲ*
wet shawl wet-P shawl
'wet shawl' 'wet shawls'

The key difference with nominal forms, of course, is that ExMtr seems to apply unexceptionally to singular (uninflected) adjectives, while in the case of (underived) nouns, extrametricality may be optionally overridden at the post-lexical level. Since the post-lexical phonology is sensitive to morpho-syntactic information such as word class, it is possible that the difference between adjectives and nouns is specified as the difference between applying initial extrametricality or not. Since applying extrametricality at the post-lexical level for adjectives would render the rules identical to those of the PrWd level, no variability is predicted in the surface stress position (cf. Table 4.19).

Table 4.19: Uninflected, disyllabic adjectives with final open syllables: Initial extrametricality at the post-lexical level

		(a.)/ŋifor/ 'wet'	(b.)/pitʃi/ 'small'
Word	ExMtr; Foot; Prom;	* [⟨ŋɨ⟩.(for)]$_{\omega}$	* [⟨pi⟩.(tʃí)]$_{\omega}$
Post-lexical	ExMtr$_{\text{ADJ}}$; Foot; Prom	* [⟨ŋɨ⟩.(for)]$_{\text{ADJ}}$	* [⟨pi⟩.(tʃi)]$_{\text{ADJ}}$
Surface		[ŋɨfór]	[pitʃí]

An alternative account would be to consider all adjectives inflected, the singular marker being an empty mora (cf. Table 4.20). Unfortunately, we have no additional means of differentiating the two analyses.

Evidently, each of the two possible analyses relies on a different feature of Mapudungun. The word-class-specific extrametricality analysis (Table 4.19) relies on the PrWd level's sensitivity to morpho-syntactic information, while the empty morpheme analysis (Table 4.20) relies on the difference in word categories as regards the possibility of taking inflectional suffixes. The latter analysis is particularly attractive to us in that it allows the surface differences in stress patterns to grow out of structural differences in nouns and adjectives, rather than having a top down system. It furthermore follows the expected pattern that post-lexical process are not bound to the same lexical constraints on boundaries such as, for instance, extrametricality.

Table 4.20: Uninflected, disyllabic adjectives with final open syllables: zero monomoraic affix

		(a.)/ŋɨfor-μ/ 'wet-S'	(b.)/pitʃi-μ/ 'small-S'
Stem	ExMtr; Foot; Prom;	* [⟨ŋɨ⟩.(for)]$_{S}$	* [⟨pi⟩.(tʃí)]$_{S}$
Word	ExMtr; Foot; Prom;	* [⟨ŋɨ⟩.(for)-μ]$_{\omega}$	* [⟨pi⟩.(tʃí-μ)]$_{\omega}$
Post-lexical	Foot Prom	* [ŋɨ.(for)-μ]$_{\omega}$	* [pi.(tʃi-μ)]$_{\omega}$
Surface		[ŋɨfór]	[pitʃí]

4.5 Contempory Mapudungun Stress Assignment: Summary and implications

The original data and analyses conducted throughout this chapter present a picture of Mapudungun stress that is fundamentally at variance with most other accounts of the topic. In particular, the quantity insensitive iambic pattern – perpetuated in the

typological literature on the basis of Echeverría and Contreras (1965) – is shown to be dubious, at the very least.[19] Weight sensitivity was claimed to be a major factor in stress placement, in particular with regards to the right edge of the PrWd in all word categories.

Although other accounts of the language's stress system are either implicitly (Augusta 1903; Suárez 1959; Salas 2006; Zúñiga 2006b) or explicitly (Zúñiga 2006a) trochaic in nature – like our own – none presents an adequate account of the interaction of footing and morphological structure. This lack of theoretical refinement leaves variability relatively unconstrained in the stress system, a state of affairs that we set out to amend in this chapter.

4.5.1 Level-ordered rules vs. iterative footing

Throughout the analysis presented here, a number of basic assumptions have been made within the tradition of Lexical Phonology. The key insight of theories within this framework is that working from the surface level alone, phonological patterns may appear highly idiosyncratic, but allowing for different rules to apply to morphological domains in an ordered fashion provides much more intuitive generalisations about the phonological patterns. In an attempt to provide further grounding for the application of this type of analysis, we reconsider the possibility of iterative footing in Mapudungun, to later move on to revisit the major claims we have made regarding the lexical phonology of the language.

[19] We do not claim, however, that the quantity insensitive iamb should be altogether discredited as a possible foot type, only that it is not representative of our data for Mapudungun. In the typology of Gordon (2002) there are nine languages proposed as having a quantity insensitive iambic pattern; one of these, of course, is Mapudungun (Araucanian). Altshuler (2006, 2009), furthermore, proposes that Osage (Siouan) presents itself as a promising candidate for this type of foot structure.

4.5.1.1 Evaluating iterative footing

Although surface-only accounts come in a variety of forms, the lowest common denominator for all of them would claim that phonological rules (or constraints) apply to the entire word with no morphosyntactic subdivisions. For the cases of stress assignment, footing proceeds from one edge to the other, creating iterative stress marks and applying the highest level of prominence to a pre-selected edge. The examples in 4.25 – with the actual position of stress as compared to the predicted position of stress – are given to illustrate the difficulties for such an approach in Mapudungun.

(4.25) Failure of iterative stress in Mapudungun (iterating moraic-trochees parsed left to right, predicted stress positions underlined, actual stress marked with acute accent):

a. e. (lu. -pé.) (-fi̱-j)
give-PX-INV.3SP-IND.3
's/he just gave x to him/her'

b. (kof.) ké. (-tu. -me.) (-kí-j)
bread-VB-AND-HABIT-IND.3
's/he usually went around eating bread'

c. (a. mú.) (-ke. -la.) (já-j)
go-HABIT-NEG-FUT-IND.3
's/he usually would not go'

d. (ma. pù.) -tʃé
city-person
'cityfolk'

The forms in 4.25 show that the iteration of moraic trochees from right to left simply cannot cope with the actual patterns of stress in the language. In particular, the primacy of derived stem stress (4.25a) cannot be captured in this approach. What is more, the choice between stressing the final syllable of the extended stem and stressing the penultimate mora would present difficulties to most other surface-based accounts (cf. §4.3.2). The forms in 4.25b and c incorrectly predict some degree of stress on the initial syllable of polysyllabic stems. Finally, 4.25d shows that compounds cannot be footed as single words on the surface. The fact that we find no alternation in

the position of stress in the first element of a light-final disyllabic first element in a compound (i.e. *ma.pù.-ʧé* does not alternate with **má.pu.-ʧé*) also argues against footing the two elements as if they were fully independent words.

4.5.1.2 Level ordering

Our analysis of Mapudungun stress data moved from monomorphemes (nouns §3.2), to polymorphemic words (first compound nouns, §3.3, then verbs, §3.4). Approaching the data in this order has made it evident that stress assignment in Mapudungun does not simply apply iteratively across the entire morpho-syntactic word. Morphological structure undoubtedly plays a role in stress. In particular, the domains of the root and the stem, alongside the prosodic word, appear to affect stress assignment.

Another overarching pattern that has become evident in this process is that – regardless of the domain – prominences are added with relation to the right edge. In the analyses given for all word categories, the rules of stress assignment are identical, revealing a number of idiosyncrasies that depend on the domain of application of the rules. Although the rules are identical, not all rules apply to all levels. In particular, the NO-CLASH rule does not apply to the PRWD level, though it does apply as a post-lexical rule. Conversely, EXMTR applies to all the lexical domains, but is no longer available in the post-lexical phonology. For all word categories, we have claimed that a right-aligned moraic trochee fits the data best. In the case of verbs, rules are also identical, though NO-CLASH also applies not only to the post-lexical levels, but in the context of cyclic stem construction.

The issue of cyclicity of stem-stress is key in our opting for a Lexical Phonology approach rather than a Stratal OT analysis (cf. Kiparsky 2000, 2008, Bermúdez-Otero 2011, 2012, 2014). While both theories are strongly based on the notion of cyclicity, the rule-based theory places no restrictions on re-application within particular domains.

The constraint-based one, however, proposes only three cycles, and one application of constraints within each morphological domain (stem, word and phrase). Evidently the way we have proposed the stem-building process to take place (in tandem with cyclic stress assignment) is incompatible with this 'one pass per domain' approach. Furthermore, this cannot be dismissed as a case of what Bermúdez-Otero calls the 'stem-level syndrome' (2012), as stem building in Mapudungun generally does not display the irregularities which are usually associated to lexical, non-analytic listedness, which are claimed for the stem-domain overall in Bermúdez-Otero (2012, 2013).

In the light of the different prosodic domains and rules we have described in this chapter, the stress assignment system of Mapudungun must rely on at least two levels of cyclic, lexical phonology (the STEM and the PRWD), as well as a single post-lexical level. Crucially, although the lexical level may have some exceptions specific to particular underlying elements, the application of rules is unexceptional. At the post-lexical level, however, rules may or may not apply depending on speech style and rate.

The two levels of the lexical phonology are distinguished mostly by the nature of the morphological processes that they encompass. Level 1 adds derivational morphology to STEMS, while Level 2 adds inflectional morphology to STEMS in order to create WORDS, as well as concatenating WORDS in order to create compounds. Finally, the post- lexical level plays an important role: it strives to resolve ambiguities in headedness and main prominence, as well as optimising syllable structure through epenthesis, but also applies footing (FOOT) and prominence assignment (PROM) rules that, in most cases are redundant, but which re-foot light-final disyllabic nouns.

The key rules that affect the position of stress in Mapudungun are given in their final version here:

(4.26) Stress Assignment - Final Version

1. Initial Extrametricality (ExMtr): Mark the leftmost syllable of a domain as extrametrical.
2. Footing (Foot): Build moraic trochees aligned to right edge of the domain. Where a minimum of two moras are unavailable, build a single monomoraic foot at the stem level, but not at the word level.
3. Prominence Assignment (Prom): Add a prominence mark to the heads of feet within the domain.
4. Clash Avoidance (no-clash): In the context of two adjacent syllables bearing the same level of prominence, promote either the superordinate or head domain by adding a further prominence mark to the head of the root belonging to it.
5. Syllabification (Syllab):
   (a) Parse a domain into syllables from left to right. Create nuclei using no more than one vocalic segment. In series of consonants, prioritise the creation of a mono-segmental onset. Remaining consonantal material may be syllabified in the coda.
   (b) For the case of high sonorants underspecified for syllabicity (in particular /j∼i/ or ⟨I⟩), parse as a nucleus when the sonorant is not directly adjacent to another nucleus. In a series of more than one underspecified element, parse the first as a nucleus when following a consonant and as a consonant when following a nucleus. In the latter case, delete all following homorganic sonorants if word-final or followed by a vowel (/C-I-I/ > [Cij]; /V-I-I/ > [Vj]).

6. Glide deletion (GD): In unstressed syllables, delete a word-final glide in a homorganic sequence.
7. Epenthesis (Epenth): Break up a series of two or more consonants in the coda of a syllable by inserting a /ɨ/ or /ə/ before the final consonant.

Syllab occurs at all levels, as do Foot and Prom. The key restriction here, however, is that, at the stem level, feet built on previous stem-cycles cannot be re-footed, while stem-stress can be reassigned at the word level. The main restriction at the word level, however, is that refooting cannot occur across word boundaries (i.e. in compounds). Where a full moraic trochee cannot be footed within the domain, a monomoraic foot may be built.

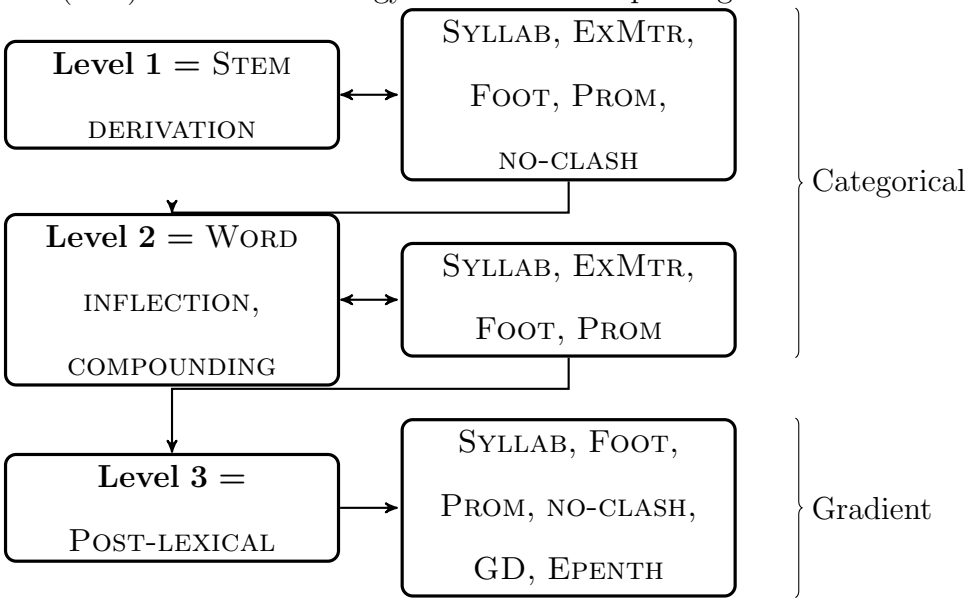
ExMtr applies at all levels, excepting the post-lexical one. Where the initial syllable is coextensive with the entirety of the domain, (monosyllabic roots/stems/words), extrametricality does not apply.

The no-clash rule applies in the context of identical prominence level adjacency at the stem level, as well as at the post-lexical level. At the lexical level, it promotes the superordinate stem domain, while at the post-lexical level it either promotes the verb's right edge, or the head of a compound. The key difference in the application within the lexical level is its categorical nature, where the promoted element becomes undominated. Post-lexically the added prominence is somewhat gradient.

Finally, GD and Epenth apply only at the post-lexical level, once all stress assignment rules have been instantiated. The reasons for this are, on the one hand, that final glides usually do attract stress to final syllables (except where an undominated stress preceedes this syllable), and on the other, that the epenthetic vowel is never stressed, even when in a final closed syllable. Importantly, these rules also have a gradient character which fits in best with the post-lexical module where speech rate and style have an effect.

The rules and domains that interact to create Mapudungun stress patterns are given in 4.27.

(4.27) Lexical Phonology modules for Mapudungun stress:



4.5.2 Post-lexical application of rules, context and register

Practically all accounts of Mapudungun (the notable exception being Echeverría & Contreras 1965) include, along with their claims as to the position of stress, a strong caveat asserting that these are only tendencies and that prominence distribution is ultimately variable. Although the analysis presented in this chapter does not deny the fact that stress position may vary in the language, it has provided some strong constraints on such variation.

The key device that was set in place in order to deal with such alternation was the split between the lexical and post-lexical application of prosodic rules. Those that are exclusive to the post-lexical domain, such as Epenth, are unambiguously gradient, with most of the accounts of the language, as well as native speaker intuitions stating that both [t̪si.paj.mɨn] and [t̪si.pajmn], for example, are acceptable pronunciations of

'we$_{\text{P}}$ exit'. At the other end of the spectrum are rules that apply categorically within the lexicon and for which there is little room for ambiguity. A rule of this type is, for instance, the application of NO-CLASH within the stem-level. Again, this rule produces undominated stress on stem extensions which are unambiguously perceived by native speakers. Most of the rules we have given, however, are somewhere in between these two extremes, as they involve the interaction of structure built in the lexical module and post-lexical rules. A typical case of this is the application of FOOT and PROM at the post-lexical level.

Crucially, however, our account predicts a limited number of loci for alternation, which also allows it to be compatible with the two major factors claimed to condition stress alternation: context and register. As was shown in §3.2.3, the position within the phrase has no clear impact on the position of stress in disyllables with a final light syllable. However, the frequency of initial position is much higher for nouns in isolation than for those in context. In this sense, the tendency to shift stress to the final syllable (i.e. not to apply the post-lexical rules – cf. §4.4.1) is not conditioned by, say the presence of the postposition *mew* (Augusta 1903; Smeets 2008) or the phrase-final position (Febrés 1765), but by its use within and without context. Although this seems somewhat counterintuitive, as one may expect the post-lexical rules to apply more consistently in running speech, the pattern can be explained by the other major factor: register.

One of the recurring observations regarding the position of stress in disyllables is that the use of final stress in nouns ending in a vowel is seen as having a greater degree of formalness. Strikingly, this is distinguished by native speakers from 'correctness', which is usually ascribed to stress-initial forms. The evidence for final stress in disyllables being more 'formal' can be traced as far back as the observations made by the Jesuit missionary Andrés Febrés in his grammar of the language, who claims that final stress

is characteristic of formal speeches – called *coyaghtun* – especially before pauses (Febrés 1765: 8). This is still typical of the patterns used for songs, prayers, and other formulaic language.[20] In opposition, then, the application of the post-lexical rules (overriding initial extrametricality) appears to have a more 'informal' character.

Although our data-gathering techniques did not control for register in any consistent way, questions were given in a very formulaic pattern, as were, of course, translations (see §3.1; Appendix A). The question and translation sections of the interviews were, precisely, the source of our data for nouns in context. Picture naming, on the other hand, was performed by calling out words that were thought to best suit the pictures, in a much less structured manner. It is our contention, then, that the alternation in the position of stress in disyllables – that is, the application of the post-lexical rule – is related to the perceived register of the discourse. For our data the more formal register was that of words in context, while the less formal register was that of words in isolation.

Table 4.21: Formal (F) and informal (I) register and the application of post-lexical rules (only relevant for vowel final disyllabic nouns)

		(a.)/wiŋka/$_{\text{F}}$ 'foreigner'	(b.)/wiŋka/$_{\text{I}}$ 'foreigner'	(c.)/mapu/$_{\text{F}}$ 'land'	(d.)/mapu/$_{\text{I}}$ 'land'
WORD	EXMTR; FOOT; PROM	* [⟨wiŋ⟩.(ka)]$_{\omega}$	* [⟨wiŋ⟩.(ka)]$_{\omega}$	* [⟨ma⟩.(pu)]$_{\omega}$	* [⟨ma⟩.(pu)]$_{\omega}$
POST-LEXICAL	FOOT; PROM	—	* [(wiŋ).ka]$_{\omega}$	—	* [(ma.pu)]$_{\omega}$
SURFACE		[wiŋká]	[wíŋka]	[mapú]	[mápu]

Be this as it may, the alternation is exclusive to the disyllables with final open syllables. This is, furthermore, the only context within our stress assignment system which is predicted to allow for a different output for stress position on the basis of the

[20]This is particularly true for text that is read aloud, such as the case of the texts recorded for Zúñiga's grammar (2006b).

application of the FOOT and PROM rules within the lexical and post-lexical modules. The key, we recall, is that, while EXMTR is in force within the lexicon, it is absent at the post-lexical level.

4.5.3 Outlook

Accounting for the highly convoluted patterns of word-stress in Mapudungun has required a couple of strong claims regarding the language's stress assignment system. The first of these, which we have discussed at length (especially in §4.2.3), is that the language displays syllable-initial extrametricality, which is typologically rare and theoretically contentious. The second claim is that identical metrical rules apply both at the lexical and the post-lexical levels. The previous section focused on one consequence of this proposal, in particular, effects of FOOT and PROM on the stress of vowel-final disyllables. Another important aspect of the extension of metrical rules to the post-lexical domain relates to the application of the NO-CLASH rule to verbs and compounds post-lexically, which produces a gradient promotion of the right edge in verbs and the head element in compounds.

The fact that the clash resolution strategy applies optionally with reference to speech rate and style is not surprising for compounds, which show some alternation in their stress degree of differentiation of prominence patterns in a number of languages (see, for example, Plag et al. 2008 for English). Since both sub-elements of the compound are PRWDS in their own right, the definitional notion of culminativity in word-stress (i.e. that there is only one maximal level of stress per word, cf. Jakobson 1931; Trubetzkoy 1939; Martinet 1954, 1964; Hyman 1977; Lieberman & Prince 1977; Hayes 1995; Kager 2007 *inter alia*) may be applied more strictly to the subordinate words than the compound itself.

However, for the case of verbs, the fact that post-lexical application of stress leads

only to a *tendency* to promote the word level – but no categorical pinpointing of the position of main stress – means that culminativity is not fully enforced. The alternation in prominences seems to denote a particular lack of cohesion in the PrWd level of verbs, an interesting fact as regards the typological profile of the language. As we noted in our introduction to the language, §1.2.2.1, the focal point of the polysynthetic system of Mapudungun is the verb and its intricate morphological structure. Furthermore, as an ideal language of the type makes little distinction between the level of the word and the level of the phrase,[21] it seems plausible that this lack of morphosyntactic difference between words and phrases is transferred into a tendency for Mapudungun PrWds to be more phrase-like as regards stress.

The pattern in our data is captured by the fact that the NO-CLASH rule (or any other prominence enhancing rule) does not apply at the PrWd level, making this domain distinct from both subordinate and superordinate ones. The peculiarities of the PrWd in Mapudungun are unsurprising within Prosodic Phonology inasmuch as it is well attested that the domain is key in the mapping of morphosyntactic structure to phonological structure, being, more than any other domain 'split between two worlds' (Revithiadou 2011: 1214), a trait that we see clearly borne out in the case of complex nouns, but which is further exacerbated in the verbal system.

It is our proposal that there is a certain convergence of phrasal phenomena into the PrWd level of Mapudungun. Such a claim has interesting ramifications with regards to the diachronic development of the language. Some of the major questions to this effect regard the origins and stability of a system with so much inbuilt variation, especially in the context of intense contact and bilingualism. In the next chapter we turn to addressing some of these issues in the light of the historical evidence for the

[21]Recall that Comrie (1989: 46) claims that 'In a polysynthetic language, or rather in an ideal polysynthetic language, each sentence consists of just one word, this word in turn, consisting of as many morphemes as are necessary to express the intended meaning.'

language.

(4.28) Summary of analysis for contemporary Mapudungun stress:

- **Basic foot structure:**
  - Single right-aligned moraic trochee.
  - Monomoraic feet allowed, where otherwise the domain remains unparsed.
- **Domains of stress assignment:**
  - Stress is assigned at the STEM, PRWD and POST-LEXICAL levels.
  - Most non-verbs are monomorphemic.
  - Nominal compounds are (right- or left-headed) recursive PRWDs.
  - Verbal stems are roots plus core derivational suffixes (stem-extensions).
  - Stems are built cyclically, footing first the root, then each extension.
  - Footing may not apply across feet in a previous cycle at the same level.
  - Footing applies post-lexically (redundant except for vowel-final disyllables).
- **Initial extrametricality:**
  - Applies to all lexical domains except for monosyllables.
  - Is erased at the end of a cycle.
  - Guarantees final stress in roots (always mono or disyllabic).
  - Makes disyllabic first elements in compounds stress-final.
  - Does not interact with stress in trisyllables (in isolation or in compounds).
  - Does not apply at the post-lexical level.
- **Stress clash:**
  - Is resolved (NO-CLASH) by promoting:
    - The superordinate domain (lexical for stems, post-lexical for words).
    - The head-element of a compound (post-lexical).
  - NO-CLASH applies:
    - Categorically at the lexical level (stems).
    - Gradiently at the post-lexical level (words).
- **As a result:**
  - Monomorphemic nouns are stressed on the penultimate mora.
    - Only vowel-final disyllables interact with initial extrametricality.
    - Post lexical footing (w/o extrametricality) creates register-dependent alternations in stress position.
  - Nominal compounds have two stresses, one per PRWD:
    - Where stresses are not adjacent, they are both realised.
    - In clash, the head-element's stress is promoted.

- Verbs have two stresses: stem final and word-level penultimate mora.
  - Where stresses are not adjacent, both are realised.
  - In underived stems, NO-CLASH promotes word-level stress (gradient).
  - Derived-stem stress is promoted categorically by NO-CLASH.

Chapter 5

Mapudungun Past and Present:

A diachronic exploration of morphological structure and stress assignment

The three preceding chapters present a survey of published accounts of present-day Mapudungun (PDM) stress, followed by our own new data and analysis. Lack of agreement in previous work on the language, in our view, is unsurprising, as the ultimate system for stress assignment is not only layered, but allows for a fair amount of variability. The pervasiveness of such features begs the question as to the stability of such a system overall. In this chapter we review the historical data for the language, trying to elucidate the origins of such an idiosyncratic system. We also attempt to situate these changes within a more general typology of prosodic change and evaluate the incidence of language internal and contact phenomena therein.

5.1 Evidence for the history of Mapudungun morphoprosody: *1606-1916*

The data we survey is significantly different from that available for Indo-European languages, where historical depth and close genetic affiliation allow for a broader view of the phenomena in context. Furthermore, as no written record exists of the language prior to European arrival, and writing has only recently become more widespread amongst some native speakers, the older Mapudungun records we have are all provided by non-native speakers. Finally, as no truly consistent marking of stress is given in the available sources (it seems clear that it was never phonemic), and no major synchronic or diachronic stress-related alternations have been put forth, we must rely mostly on explicit descriptions of stress given in grammars.

Of course, this type of data is less than ideal. Although some of the missionary grammars show careful exemplification and details as to contextual variation in the position of stress, others give little or no examples whatsoever. While some of the historical grammars give explicit stress rules for only some specific items and categories, others are extremely broad, omitting forms that display idiosyncratic behaviour in the PDM data (Chapter 3), as well as in other grammars.

To further complicate matters, we survey not only stress, but also its relation to morphological structure. Unfortunately, the early grammars of the language – from the turn of the seventeenth century to the beginning of the twentieth – are not uniform in terms of the theoretical framework in which they were written and, consequently, in the segmentation and mapping of morphemes to meaning. Once the grammars' claims have been carefully reviewed, we attempt to find a common framework for referring to morphological structure and rules of stress assignment. In order to do so, we have couched our analysis in the same Lexical Phonology framework as our main analysis

for contemporary Mapudungun (Chapter 4).

As in PDM the basic pattern for stress assignment is best viewed in monomorphemic nouns. Compound nominals are only examined for the later stages of the language, where stress data is available for them. The principal focus in terms of complex morphological structure, however, is on the verbal system, where the vast majority of morphological processes are observed. In particular, we look into intransitive forms of the three described moods of Mapudungun: indicative, subjunctive and imperative.[1] This is done since their semantics are generally agreed upon, and evidence is provided for them in all the grammars. In this sense, such forms set forth a reliable overview of the evolution of the language's stress system, which will be complemented with additional evidence from further inflectional morphology, and ultimately with the nominal system as well.

As a result of the substantial limitations in the data, our analysis is speculative in nature. We move from the earliest and sparsest data (Valdivia 1606, §5.2), to progressively more contemporary-like accounts (Havestadt 1777; Febrés 1765, §5.3 Lenz 1895-1897; Augusta 1903 §5.4), attempting to reconstruct specific synchronic stages of the stress assignment system. This done, we attempt to establish the diachronic path from one system to the next, up to PDM, putting forth some of the possible motivations for change and preservation of morphological and prosodic structure (cf. 5.5). Here, the role of the learner is emphasised in creating patterns on the basis of both probabilistic and categorical data in the input.

[1]Earlier grammars (Valdivia 1606; Havestadt 1777; Febrés 1765) also include the optative and infinitives as moods.

5.2 First attestations: *Luis de Valdivia (1606) and the turn of the seventeenth century*

Father Luis de Valdivia, a Spanish Jesuit, was one of the first Europeans to take a genuine interest in the culture and language of the Mapuche. Born in Granada, in 1560, he was first stationed to the Viceroyalty of Lima, in 1589, from whence he was to join a group of the first Jesuits commissioned to establish the Chilean Mission of the Society of Jesus. In 1593, the missionaries arrived at the port of Coquimbo, making their way south to Santiago by land (see Toribio Medina 1894 and Fig. 1.1). Throughout his stay in the country, Valdivia was actively involved not only in the education of the colonists, and evangelisation of the natives, but also in early attempts to prevent the inevitable military confrontations between the two groups. He travelled widely in the territories, learning and preaching in the language (see de Olivares 2005; Toribio Medina 1894).

Valdivia's *Art and Grammar* of Mapudungun, first published in Lima in 1606, was the result of almost 15 years of first-hand experience with the language and was meant to be a practical tool in preparing missionaries for bringing the Christian message to the Mapuche. The work appears to have been composed with access to an earlier one by Valdivia's Jesuit contemporary, Fr. Gabriel de Vega, which has since been lost (see Toribio Medina 1894: 40-42, 1897: X-XI, Espindola 1974: 8). Valdivia's original volume includes a grammatical treatise, a brief Mapudungun-Spanish glossary (*Vocabulario*) and a small collection of texts for the purposes of evangelisation.[2]

[2]The texts are included in two versions: one in the language claimed to be spoken in the Bishopric of Santiago and the other in that of Imperial, the second bishopric established in Chile (stretching from the river Maule in the north, to the southernmost tip of the continent, and from the Pacific to the Atlantic oceans). The texts are a confessionary and two versions of the *Catechism and Christian Doctrine* composed, originally in Spanish, in a Catholic Council formed in Lima for the purpose of the establishment of materials for the evangelisation of the natives in the newly acquired territories of the Spanish crown.

The descriptions we find in the grammar include information on the variety of the language spoken at the time in the bishopric of Santiago, as well as the language spoken by the wider group he terms *Beliches*, probably corresponding to Mapudungun *wiʎi-tʃe* 'south-person'. In short, much of the description is based on a dialect that is today extinct: that spoken in the valley of the Mapocho River, in and around Santiago. The remainder of the data is from the lands 'further south' where 'the Indians are more numerous' (Valdivia 1606: *Vocabulario*, final note) and where 'the language is spoken in its proper form' (1606: 9). Of course, at the end of the sixteenth century, Spanish presence in the territories where the language is spoken today was sparse and unstable,[3] so it is most likely that the second variety of the language described by Valdivia is not what is termed *Huilliche* today, but a predecessor of the northernmost varieties preserved today (dialects I and II in Croese 1980, see Fig. 1.2). In 1621, Valdivia also published a series of nine sermons in the 'Language of Chile'. Although he does not provide any explicit data regarding their dialectal provenance, they seem to display features of the historical northern varieties of the language, but lack the features of the dialect of Santiago which Valdivia explicitly mentions (see Fig. 1.2 and Adelaar & Muysken 2004: 508-509).

As is the case for Havestadt (1777) and Febrés (1765) as well, Valdivia's grammar was written in the traditional, scholastic model of the day, taking Latin as a prototype. We find, for example, a description of nominal paradigms based on case, number and gender categories – which are only rarely marked by periphrastic forms in Mapudungun – as well as a series of tense and aspect distinctions based on the classical Latin system. Needless to say, this type of description is rather inadequate for a language

[3]The seat of the Bishopric of Imperial – Carahue today – is only a few tens of kilometres from the site of our own fieldwork, in the Mapuche heartland. Nevertheless, at the time, this was truly only an outpost of Spanish advances, and relations with the Mapuche were highly bellicose. Imperial was garrisoned with only 40 men and was completely razed by Mapuche uprisings in 1600.

so typologically dissimilar from Latin.[4] As a matter of fact, Valdivia finds himself innovating a fair amount, creating a range of new categories in order to deal with his own data.

With Valdivia, for instance, begins a long tradition in Mapudungun studies (broken by the advent of Adalberto Salas's early work: 1978b; 1979) whereby morphological markings of the two arguments in transitive verbs are termed 'transitions' (Adelaar 1997). The typical verb with two arguments is, in this view, meant to represent a transaction where something is passed from one person to another. Hence, Valdivia – and successive historical grammars – establish several transitions, each one specific to the interaction between two arguments according to their person and number. Although the system is refined somewhat throughout the early grammars of the language, the basic structure remains, being unable to account, for instance, for the difference between the use of the direct or the inverse forms where both arguments belong to the 3rd person (5.1).[5] This issue is resolved in Salas (1978b, 1979, 2006) by positing a focalisation hierarchy for the language that is based on the inherent focus of persons (1>2>3) and the context of discourse (3_F>3), as we saw in §1.2.2 (p. 43).

[4]Lenz goes so far as to say that the Scholastic approach of the early grammars 'completely falsified the grammatical system of the natives' (1920: 6) and that 'it is impossible that violence was not done to the language' as 'the grammatical theory of the priests was completely false and did not fit their own examples' (1895-1897: XI). On the other hand, Salas argues that the language described by these missionaries, though no doubt 'distorted' by the 'inadequate' framework, was undoubtedly Mapudungun and not a figment of the Jesuits' imagination (2003: 7, 1980: 24-25). Salas also points out the need to reevaluate the data in these grammars as they 'are *the* available source for a diachronic study of Mapuche' (1980 p. 25). We could not agree more with the latter claim.

[5]Throughout the early grammars, we have tried not to make matters more difficult for our reader by presenting the transcription system of the authors in detail. Instead, we have tried to equate the elements being transcribed to the forms we use in our own contemporary transcripts. Where the differences in transcriptions seem to represent other features of a segment, we have noted this and provided an alternative transcription.

(5.1) Unexplained alternation in the third to third person transition (Valdivia 1606: 49) – glosses based on Salas (2006):

a. *Pedro* *elu-fi-j* *Juan*
P.$_{F}$ give-3SP-IND.3 J.
'Pedro$_{F}$ gave Juan x'

b. *Pedro* *elu-e-j-ew* *Juan*
P.$_{F}$ give-INV-IND.3-3SP J.
'Juan gave Pedro$_{F}$ x'

If we abstract away from its theoretical framework, however, the grammar is very thorough and generally considered to present a fair description of the language, especially as regards phonology and verbal morphology (see Salas 2003: 7, Zwartjes 2000: 205-6, but also Lenz 1895-1897: 16).

5.2.1 Verbal morphology

As concerns the morphology of the language, Valdivia provides a detailed account of numerous verbal suffixes within the context of the Latin verbal paradigms. Although the semantic roles assigned to the suffixes are often at odds with modern analyses of the language, the structural elements are very similar – indeed mostly identical – to what we find in present day descriptions (Salas 1980, 2003).

The overall structure of the verb, in Valdivia's account, is presented as being relatively straightforward: we find a succession of tense and aspect markings immediately following the verbal root and, after these, mood, person and number markings. The marking for mood, person and number (Salas's 2006 'obligatory finite inflection', OFI) is not decomposed into the constituent parts as in contemporary accounts, but a fusional-type structure is assumed. Valdivia identifies five moods: indicative, subjunctive, imperative, optative, and infinitive. The optative is included in Valdivia's grammar as an independent form, but today would simply be analysed as the first

person imperative, which has the meaning of 'having the intention of x'.[6] The infinitive, of course, does not take person and number marking and is identical in form to what we find today (*-n* ∼ *-in*). Crucially, the person and number markings for the indicative, subjunctive and imperative forms are equivalent to those of contemporary descriptions, although they are not broken down into smaller morphological elements, as we find today (cf. Table 3.18).[7]

Table 5.1: Mood, person and number suffixes as given by (Valdivia 1606)

	Indicative			Subjunctive			Imperative		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Sing.	*-n*	*-imi*	*-i*	*-li*	*-lmi*	*-le*	*-tʃi*	*-ŋe*	*-pe*
Dual	*-iu*	*-imu*	*-iŋu*	*-liu*	*-lmu*	*-lŋu*	*-iu*	*-mu*	*-peŋu*
Plur.	*-iɲ*	*-imn*	*-iŋn*	*-liɲ*	*-lmn*	*-lŋn*	*-iɲ*	*-mn*	*-peŋn*

As the internal structure of these complex morphemes is of some importance to the argument, their constituent parts (mood, person, number) are referred to here as they are in contemporary accounts (see §3.4.1.1). Such elements, it is assumed, would have been more or less transparent to speakers of the language at every stage.

The ultimate underlying agglutinative elements for the OFI in Valdivia's account can be summarised as in Table 5.2, which is identical to what we have proposed for PDM (cf. Table 3.18). We assume that all the singular forms of the imperative, as well as the indicative 1st singular, are portmanteau morphemes, while the vowel in the subjunctive 3rd singular is a case of dissimilation (see fn. 18 in Chapter 3, p.119).

Clearly, although Valdivia makes no mention of the implied syllabification, his transcriptions tend to use the form ⟨y⟩ (presumably IPA [j]) after a vowel, unless followed

[6]The different person/number forms given by Valdivia for the optative are actually only the markings for the SP in transitive verbs (he gives the example of *eluin* 'give') with the SP being the 1st singular (of the imperative: *-tʃi*).

[7]Although the dual and plural markers of the third person are given as separate, clitic forms in contemporary grammars, we have given them as part of Valdivia's 'fusional-like' affixes. Doing this is not absolutely necessary but will help us understand how the missionary's own rules apply to the paradigm.

Table 5.2: Mood, focal person and number markers in Valdivia (1606) – as per PDM

	Indicative	Subjunctive	Imperative
Mood	-i∼j	-(ɨ)l	-∅
	First	Second	Third
Person	-i∼j	-m	-∅
	Singular	Dual	Plural
Number	-i∼j	-u	-(ɨ)n

by a word-final consonant (*elu-j-u* 'give-IND.1-D' or *elu-i-ɲ* 'give-IND.1P), and the form ⟨i⟩ either between consonants, between a consonant and the word edge, or following two consonants (*kon-i-ɲ* 'enter-IND.1-P', *elu-l-i* 'give-SUBJ.1S or *kon-l-i-u* 'enter-SUBJ-1-D'). This, differs slightly from what we find in PDM and in other stages of the language examined below. However, the distribution itself gives us no clear idea of the underlying syllabicity of the segment (or segments), but it indicates that there is likely a reassignment of its syllabic nature at some point in the derivation.

5.2.2 Stress assignment, Valdivia (1606)

The stress assignment system for the language is given in the final section of the grammar (1606: 74-5). Unfortunately, the rules are extremely parsimonious, no concrete examples are given, and there is no stress marking in the texts or examples elsewhere in his grammar or in the 'Sermons' (Valdivia 1621). Although we are told that there are a number of exceptions, the stress system is summed up by three basic rules:[8]

[8]Here, as in the other sources of early Mapudungun, I have provided close paraphrases, and not direct translations, of the original Spanish (or Latin), in order to smooth over some of the idiosyncrasies of the theoretical frameworks and style of the authors. Great care has been taken, of course, to preserve the original intention of the text.

(5.2) Rules for stress assignment, Valdivia (1606: 74-5)

- **Rule 1** All nouns, prepositions, conjunctions, adjectives, adverbs, participles and interjections tend to be stressed on the penultimate syllable, as are deverbal nouns, except when ending in the particle *we*, in which case they are stressed on the last syllable. In the same manner, disyllabic pronouns have stress on the penult.[9]
- **Rule 2** For verbs in the indicative, stress is on the final syllable for the first person; in verbs in the subjunctive, the first person is stressed on the penultimate syllable. For the other persons stress falls on the same syllable as the first person.
- **Rule 3** In the imperative, stress is on the penultimate syllable of the first singular dual and plural, as well as in the dual of the second and third person, but on the final syllable in the second and third person singular and plural. In transitions, stress is on the *-e* or *-mo* that marks them.

If these rules are truly representative of the distribution of Mapudungun stress at the turn of the seventeenth century, they present an important departure from what we find in our own, contemporary data. We take a look at the different word categories and attempt to reconstruct their actual patterns, accounting for their distribution.

5.2.2.1 Nominal and adjectival stress in Valdivia (1606)

The difference between present day and late sixteenth century stress is immediately evident in the case of the nominal and adjectival system. Recall that contemporary Mapudungun was claimed to have penultimate mora stress in nouns (excepting light-final disyllables, which alternate stress position), while adjectives (as well as adverbs

[9]Here we have amended the text which reads '... los pronombres de dos sílabas tienen el acento en la antepenultima' (... two-syllable pronouns have their accent on the antepenult), this should read, the penult, otherwise it is meaningless: cf. *íɲtʃe* 'I', *éjmi* 'you$_s$'.

and pronouns) had final stress. Here, nevertheless, we find only one system, which fits neither of these patterns: stress is on the penultimate syllable, regardless, apparently, of weight considerations.

Table 5.3: Penultimate syllable stress in nouns and adjectives, applying Valdivia's stress rules (by syllable number and structure)

σ-STRUCT	NOUN	ADJECTIVE
LL	*má.pu* 'land'	*vú.ta* 'big'
HL	*wáŋ.ka* 'foreigner'	*míʃ.ki* 'sweet'
LH	*lí.kan* 'crystal'	*kó.ɲoʌ́* 'purple'
HH	*l̻áf.ken̻* 'sea'	*móŋ.koʌ́* 'round'
LLL	*ma.wí.θa* 'woodland'	—
LLH	*a.tʃá.waʌ́* 'hen'	—

If Rule 1 is accurate, at least from a surface perspective, the system appears to be trochaic and quantity insensitive (i.e. a syllabic trochee, in the sense of Hayes 1985, 1995). This, of course, is at odds with the moraic system outlined in §4.1.1 for contemporary central Mapudungun, as well as with the alternations we find in the perception of stress in light-final disyllables (see §3.2.1.1 and §4.4.1).

As for the cases of deverbal nouns with the particle *-we*, the rule is unclear in terms of the syllable that is meant to be stressed. Presumably the 'particle' is the instrumental suffix (Zúñiga see 2006b: 87-88 and §1.2.2.2) that attaches both to nouns and to verbs to create nouns. In the case of noun-noun suffixation, *-we* means 'a place with abundance of x' as in *kut̻s̻al-we* 'fire-INS = hearth'. In the case of the verbal suffixation, it usually means 'a thing used for x-ing', as in *t̻s̻ari-n* 'tie-INF' vs. *t̻s̻ari-we* 'tie-INS = 'a (woollen) belt'. In both cases the suffix is the final element. However, it is not clear whether the stress is meant to attach to the final syllable of the underived

noun, or to that of the derived one. We assume that the latter is the case, as it seems more worthy of note. In such a case, we assume that derived forms behave as compounds in terms of stress, where *we* is a PrWd in its own right and receives main stress as the head (see §4.2 for PDM).

Another interesting aspect of the nominal system is that where later grammars usually break up a sequence of tautosyllabic consonants by claiming the presence of a [ɨ] or [ə], Valdivia claims that the clusters are acceptable and do not syllabify separately:

> '... in this language of Chile two consonants often precede or follow a vowel... and it should not be thought that therefore there is a new syllable besides the vowel, for there is no more than one.' (Valdivia 1606: 3)

Although we shall see that verbs show clear evidence for some form of epenthesis at morpheme boundaries (cf. 5.4 and 5.5), the process seems less clear for nouns, a fact that is also evidenced by the forms in his *Vocabulario*.

(5.3) No epenthesis claimed for initial and final consonant clusters in Valdivia (1606):

a. *pʎi*	'soul'	c. *mamʎ*	'wood'
b. *dŋu*	'word'	d. *tʃaŋʎ*	'finger'

It is possible that, as in the case of verbs, epenthesis escapes Valdivia's awareness in nouns. However, if it does exist, the process is doubtless post-lexical. If it were lexical, epenthesis would most likely interact with stress assignment (at least in the initial consonant clusters), in which case we would expect a stressed vowel to be salient enough to warrant transcription, which is evidently not the case.

5.2.2.2 Verbal stress in Valdivia (1606)

Rules 2 and 3 in (5.2) present a picture of verbal stress that is fundamentally determined by morphological structure, rather than by the phonology of the language. Stress appears to be a feature of the inflectional paradigms, rather than an algorithm that

must be computed online for each form. As the first person singular of the indicative is *-n* and that of the subjunctive, *-li*, stress will always surface on the vowel immediately preceding mood-marking (i.e. a final syllable closed by *-n* or a penultimate syllable, followed by *-li*). The vast majority of the imperative paradigm is also stressed on the vowel preceding mood-marking: here, the root-final vowel. The key exceptions are the portmanteau morphemes marking the second and third person singular, which take stress, even if they are the final syllable. Assuming that Valdivia's rules are accurate, and with the rudiments of Mapudungun verbal structure outlined above, we may reconstruct early seventeenth century verbal stress for vowel-final roots.

Table 5.4: Verbal roots ending in vowels (Valdivia, 1606).Example: *elu-n* 'to give'

INDICATIVE	1st	2nd	3rd
Singular	*elú-n*	*elú-jmi*	*elú-j*
Dual	*elú-ju*	*elú-jmu*	*elú-jŋu*
Plural	*elú-iɲ*	*elú-jmn*	*elú-jŋn*
SUBJUNCTIVE			
Singular	*elú-li*	*elú-lmi*	*elú-le*
Dual	*elú-lju*	*elú-lmu*	*elú-lŋu*
Plural	*elú-liɲ*	*elú-lmn*	*elú-lŋn*
IMPERATIVE			
Singular	*elú-tʃi*	*elu-ŋé*	*elu-pé*
Dual	*elú-ju*	*elú-mu*	*elu-péŋu*
Plural	*elú-iɲ*	*elú-mn*	*elu-péŋn*

Although Valdivia does not deal with the issue of consonant-final versus vowel-final roots, the data he provides in the *Vocabulary and Confessionary* that close his grammar, and his *Sermons* (Valdivia 1621), point to a series of verbs that present an ⟨i⟩ between the tense-aspect morphology and the mood marking of the verb. Examples are given in (5.4).

(5.4) Post-root, semantically empty ⟨i⟩ in Valdivia (1606, 1621)

a. *kim-i-n*
know-?-IND.1.S

b. *kim-i-l-m-n*
know-?-SUBJ-2-P

Although we may suggest this ⟨i⟩ is a root-element, a series of subjunctive forms (5.5a) argue against such an interpretation, since the vowel is missing from their surface form. Furthermore, the vowel may also surface separately from the root, after tense/aspect morphology, as in the case of the desiderative morpheme *θuam-* (5.5b).

(5.5) Absence ⟨i⟩ after the root and presence after *θuam-* (Valdivia 1621: 7)

a.	*kim-l-i*	b.	*kim-θuam-i-l-m-n*
	know-SUBJ-1.S		know-DESID-?-SUBJ-2-P
	'I would know'		'you (two) would like to know'

A reasonable assumption is that ⟨i⟩ is an epenthetic vowel which surfaces in order to break up illicit sequences of consonants (i.e. the result of syllabification rules). The forms where it surfaces are, therefore, consonant-final roots and morphemes which are followed by two consonants or a single, word-final consonant. The context, of course, is identical to that we have given for the epenthesis rule in present day Mapudungun (cf. §4.3.5.3), and that can be observed in a number of other accounts (cf. Zúñiga 2006b:106; Salas 2006:104). The actual quality of this vowel is not clear in Valdivia's text, but it seems quite clear that it belongs with [ɨ], in contemporary accounts.

(5.6) Proposed rule for epenthesis for early 16th century Mapudungun (Valdivia 1606 '+' = morpheme boundary):

$\emptyset \rightarrow$ ⟨i⟩ | VC ___+C_1#

The question of stress assignment for these forms is not easily resolved, since Valdivia is silent as regards their existence. However, the rule that is provided (i.e. stress the same vowel of the first person throughout the paradigm) would tend to suggest that what is stressed is a vowel that is always present in the surface form, which is not the case for the epenthetic vowel (even when it does fall in the surface 'final' syllable of the first person indicative or 'penultimate' syllable of the first person subjunctive). Furthermore, Valdivia appears to be somewhat inconsistent in his use of the epenthetic

form (cf. *elu-θuam-n* 'I want to give' 1606: 14). If the apparent epenthetic were truly stressed, it is highly unlikely that it would not surface in the written form. We will therefore assume that, in the case of consonant-final roots (that show the ⟨i⟩ ∼ ∅ alternation), said vowel (transcribed as ⟨ɨ⟩ below) is disregarded for stress assignment purposes. Furthermore, it seems reasonable to assume that there is some degree of epenthesis in every context where clusters arise (as in the case of the 2P marking /-mn/, which is most likely [-mɨn] or [-mən] in actual realisation, as assumed in current accounts (cf. §4.3.5.3 and 36). The rule, however, shows all the hallmarks of being post-lexical and not interacting with stress.[10]

Table 5.5: Verbal roots ending in consonants (Valdivia, 1606). Example: *kon-ɨn*, 'to enter'

INDICATIVE	1st	2nd	3rd
Singular	*kón-ɨ-n*	*kón-imi*	*kón-i*
Dual	*kón-ju*	*kón-imu*	*kón-iŋu*
Plural	*kón-iɲ*	*kón-imn*	*kón-iŋn*
SUBJUNCTIVE			
Singular	*kón-li*	*kón-ɨ-lmi*	*kón-le*
Dual	*kón-liu*	*kón-ɨ-lmu*	*kón-ɨlŋu*
Plural	*kón-liɲ*	*kón-ɨlmn*	k*ón-ɨlŋn*
IMPERATIVE			
Singular	*kón-tʃi*	*kon-ŋé*	*kon-pé*
Dual	*kón-ju*	*kón-mu*	*kon-péŋu*
Plural	*kón-iɲ*	*kón-ɨ-mn*	*kon-péŋn*

Excepting the imperatives *-ŋe* and *-pe*, it appears that stress is a root phenomenon, attaching to the final syllable regardless of mood, person and number marking. Nevertheless, the rules seem to imply that the addition of tense or aspect suffixes changes the placement of stress, as in (5.7), thus requiring a new analysis.

[10] One of the issues that could not be verified in the data was that of the application of epenthesis across word-boundaries. The type of materials dealt with for the historical data is not explicit enought for this to be noted.

(5.7) Stress in further inflected verbs, following Valdivia (1606):[11]

a.	b.	c.
elu-bú-n	*kim-θuám-i̱-l-m-i̱-n*	*kon-lá-n*
give-BI-IND.1S	know-DESID-EP-SUBJ-2-EP-P	enter-NEG-IND.1S

We may then consider stress as a stem phenomenon, where the stem would include the root and the tense and aspect marking, excluding mood, person and number (Salas's 'obligatory finite inflection' 2006: 102-105). This idea is furthered by the fact that the forms with transitions are stressed on the *-e* and *-mo* suffixes that mark the satellite person (SP) agent in inverse forms (see §1.2.2.1) and which always precede the OFI.[12]

(5.8) Stress in verbs with 'transitions', based on Valdivia (1606):

a.	b.	c.
elu-é-j-m-u	*elu-mó-j-u*	*elu-mó-l-i-u*
give-3SP-IND-2-D	give-2D.SP-IND.1-D	give-2S.SP-SUBJ-1-D
'He gave you two$_F$'	'You two gave us two$_F$'	'That you$_S$ gave us two$_F$'

Still, we have the problem of the final-stressed imperative forms, which are portmanteau forms marking mood, person and number. It is evident that such forms (*-ŋe* and *-pe*) are synchronically undecomposable, since they do not mark person and number according to the predominantly agglutinating pattern outlined above (cf. Table 5.2). It is possible that these forms are different in that they represent periphrastic constructions that have not been fully grammaticalised as regards stress. If this is so, *-ŋe* can be related to the root *ŋe-* 'to be' and *-pe* can be related to the root *pe-* 'to see'. If, phonologically, they represent different words, we may assume that they are

[11] In example (a.), ⟨b⟩ most likely represents [β], which is described as alternating with [v] and voiceless [f] in northernmost dialects even today, just as [θ] (⟨d⟩) is typically [ð] in the same dialects (Lenz 1895-1897; Salamanca 1997; Salamanca & Quintrileo 2009). Valdivia's spelling is further evidence for the fact that the dialects he describes are the predecessors of the northern variety of Mapudungun (dialects I and II in Croese 1980). The morpheme *-bu* (*-fu*) in Valdivia's grammar is described as a marker of the past imperfect. See Soto & Hasler (2010) and §3.4.1.1 for of a review of ideas regarding the meaning of *-fu*. Here, we follow the gloss given for the present day language: BI 'broken implicature'

[12] Valdivia's account is somewhat problematic here, as tense and aspect marking follows the SP agent markers *-e* and *-mo*, so we would expect that stress is on these forms only where there is no additional marking between them and the OFI. It is likely Valdivia provides no details regarding this interaction, as the rule would be somewhat more idiosyncratic and less concise than that given. We assume that in other tenses and aspects, stress is still on the last pre-mood marking vowel.

stressed separately as well, while *-tʃi* – presumably from the demonstrative *tʃi* – would have never borne stress, as expected for a function word. The fact that these are third person markers means that they would have lacked a specific morpheme for person, and that in the singular they would have been marked with a single high glide or vowel which may have assimilated to the final [e].[13]

These exceptions aside, verbal stress in the early seventeenth century Mapudungun of the dialects described in Valdivia's grammar can be described as in 5.9:

(5.9) Verbal stress according to Valdivia (1606):

- Stress the final stem vowel.
- The stem corresponds to the entirety of the verb minus the obligatory finite inflection (OFI= mood, person and number).

5.2.3 Formal account: Mapudungun stress assignment at the turn of the seventeenth century

Based on the reconstructed forms we have pieced together in the preceding sections, we find ourselves with a very different system for stress assignment in nouns/adjectives, as compared to verbs. Where nouns appear to be stressed invariantly on the penultimate, verbs take their stress on the stem-final vowel (where the stem excludes only the 'obligatory finite inflection'). Obviously, these conclusions are based on sparse data and do not include the unstated 'exceptions' that Valdivia alludes to. This said, the system seems to point to one of the same conundrums we found in the contemporary data: the disparity between stem-final stress – which would appear to be iambic and right-aligned in Valdivia's account – and nominal stress, which appears to be trochaic

[13] An alternative theory is that *-ŋe* and *pe* are assigned stress at the same level as the tense/aspect morphology, since they are stressed and appear to allow for person/number marking to be added on in some cases (cf. the third person dual *-pe eŋu*, and plural, *-pe-ŋn*). In such a view, the first person singular of the indicative, *-tʃi*, must have some degree of transparency in the person/number marking, since *-i* is the marker of the singular, while there is no overt marking of the first person.

and right-aligned. In the late sixteenth-century case, however, the stem is defined differently from the present day accounts, and the trochaic pattern is syllabic, rather than moraic. Nevertheless, there seems to be a clear pattern where the right edges are most prominent and where the stem prefers stress at the very end, while the word-level avoids stressing a final (open) syllable. Even more fundamentally, the stem seems to play a crucial role in the assignment of verbal stress.

(5.10) Nominal and verbal stress in Valdivia (1606): word vs. stem (trochee vs. iamb?):

	Nouns = syllabic trochee		Verbal stems = iamb (?)
	(x .)		(. x)
a.	*l̪av.ken̪* ‘sea’	b.	*i.ʦ́if.* ‘throw-SUBJ-1-D’ *-l-i.-u*

Although there are a number of ways in which the distinction between nominal and verbal stress could be dealt with (final syllable extrametricality in nouns, a catalectic syllable in verbal stems, initial extrameticality and recursive stem building in verbs as in §4.3), these neglect the fact that, with the stem defined as all verbal elements except mood, focal person and number, stem-final stress is much nearer the right edge of the word than in our present day definition, making it effectively trochaic as regards the right edge of the word in most forms of the paradigm. We note that stress avoids word-final open syllables completely, usually falling on the penultimate, but ocasionally also falling on a closed final syllable (i.e. *elú-n* ‘give-IND.1S’; *elú-j* ‘give-IND.3’) or an antepenult (i.e. *kón-i-m-i* ‘enter-IND-2-S’; *kón-l-i-u* ‘enter-SUBJ-1-D).

A reasonable assumption, and one that is in line with the following stages of the language, is to assume that in the language represented by Valdivia’s grammar, there are two stresses in verbs: one which follows the general rule, stressing the penultimate syllable, and one stressing the stem-final vowel. Clearly, the stem-final stress receives the highest level of stress.

The initial extrametricality analysis given for PDM (cf. §4.2.3) seems unlikely here, as the learner would have fewer pieces of evidence to abstract it from, mostly due to the fact that the entire category of penultimately disyllabic nouns and adjectives would contradict it. We therefore, assume that the trochaic pattern is basic, and that a simple *ad-hoc* morphological rule is responsible for stressing the final syllable of the stem (which could rely on a catalectic syllable, to be trochaic). The word-level stress rule, however, must add a stress mark both to the head of a foot and to a previously stressed syllable.

(5.11) Stress assignment rules for early-seventeenth century Mapudungun, based on Valdivia (1606). Rules 1 and 2 are applied to both the stem and the word levels, while Rule 3 is only applied to the word.

1. Syllabification (Syllab):
   (a) Parse a domain into syllables from left to right. Create nuclei using no more than one vocalic segment. In series of consonants, prioritise the creation of a mono-segmental onset.
   (b) Parse sonorants underspecified for syllabicity (in particular /j∼i/ or ⟨I⟩) as glides after a vowel, unless followed by a word-final consonant, and as nuclei either between consonants, between a consonant and the word edge, or following two consonants.
2. Footing (Foot): Build syllabic trochees aligned to right edge of the word.
3. Prominence Assignment (Prom): Assign a prominence mark to the final syllable of stems and to the heads of feet.

Note that, where main stress is always on the penultimate syllable of nouns and adjectives (cf. Table 5.6a,b), the verbal system shows cases of final (c) and antepenultimate stress (d). Final stress (c) is the result of a prominence mark being assigned to

the stem-final syllable, which in turn blocks the footing of a syllabic trochee at the right edge, and leads to a the parsing of a monosyllabic foot. Antepenultimate stress (d) arises from a stem-final syllable immediately preceding the word-level syllabic trochee. Here, the antepenult receives prominence marks at the stem and word level, while the penult receives only one mark, as the head of a word-level trochee.

Table 5.6: Sample derivations for stress assignment, following the rules in Valdivia (1606)

		(a.) /l̪afken̪/ 'foot'	(b.) /weθa/ 'bad'	(c.) /elu-n/ 'give-IND.1S'	(d.) /kon-I-m-I/ 'enter-IND-2-S'
Stem	SYLLAB, PROM	—	—	* e.lu	* kon
Word	SYLLAB FOOT, PROM	* (l̪af.ken̪)	* (we.θa)	* * e.(lun)	* * * ko.(ni.mi)
Surface		[l̪áfken̪]	[wéθa]	[elún]	[kónìmi]

5.3 Bernhardt Havestadt (1777) and Andrés Febrés (1765): *Mid-eighteenth century Mapudungun stress*

5.3.1 The eighteenth-century grammars

For a century and a half, Valdivia's grammar was the only widely available description of the Mapuche language, and it continues to be an invaluable resource for its history. The mid-eighteenth century, however, saw the arrival of two Jesuits who would endeavour to update the work of their predecessor.

5.3.1.1 Havestadt's *Chilidúgu* (1777)

The first of these grammarians was Fr. Bernhardt Havestadt (1714-1778). A native of Köln, he left the Westphalia monastery of Horst-Maria for the 'Indies' in 1746, taking

up his post in the region of *La Frontera* in March of 1748. Here he remained for twenty-two years, leaving a lively record of his evangelisation work and travels. His grammar, though apparently available in a Spanish-language manuscript in the mid-1750's, was published in Latin only in 1777 as *Chilidúgu: Sive Tratcatus Linguæ Chilensis*.[14] This work – part grammar, part compilation of texts, and part travel-log – spans three volumes and nearly one thousand pages. In its structure, it mirrors Valdivia's work, adhering even more vehemently to the scholastic approach.[15]

The nearly one thousand pages of Havestadt's work are divided into seven parts:

- **Part I:** The grammar or *Art* of *Chilidúgu* (*ʧili-θuŋu* 'Chile-speech'), or Mapudungun, which follows closely the structure of Valdivia's *Art*.
- **Part II:** A translation of the *Indiculus Universalis* by the French Jesuit François Pomey. It is useful from a pedagogical standpoint in that the text attempts a detailed description of a variety of elements of the universe, including humans, nature and cities, and thus effectively works as a vocabulary and grammar primer. Unfortunately, the texts give no stress marking so they provide little evidence for our purposes.
- **Part III:** A prose and verse translation of the *Catechism*. Here the goal is also educational, trying to make the Catholic dogma more accessible. The versification was meant to follow the melodies given in the sheet music (Part VI), and thus further the evangelisation (see Rondón 1999).
- **Part IV:** A Mapudungun to Latin vocabulary.
- **Part V:** An index of Latin words.

[14]The marks in the spelling *Chilidúgu* do not represent stress, rather the 'special *u*' – which we transcribe as [ɨ] elsewhere – and the 'Spanish *ng* sound' – which we transcribe as *ŋ*.

[15]Rojas Carrasco points out the overblown character of Havestadt's Scholastic zeal by saying that 'it is amusing to find that in his hands Mapuche declines nouns and pronouns even into the ablative' [resulta divertido comprobar cómo en sus manos el mapuche declina sus nombres y pronombres hasta en hablativo] 1940: 138.

- **Part VI:** A collection of sheet music annotated according to the sections of the verse *Catechism* they are meant to be sung to.
- **Part VII:** A map and diary of Havestadt's travels in the Mapuche territories, which presents us with a number of interesting cultural details about missionary and Mapuche life, as well as with the details of the dialects the missionary was exposed to.

Although he was based in the Jesuit mission of Santa Fe, near present day Nacimiento, at the northernmost edge of Croese's Dialect II area (1980, Fig. 1.2), he travelled much more widely in the Mapuche territories than the other grammarians. To the south, he reached all the way to Calbuco, at the northern edge of the Chiloé Archipelago, well into what today would be the southernmost dialectal area, i.e. Huilliche, or Dialect VIII. To the east, he travelled across the Andes to the pampas (today Argentina) where he visited Mendoza and other localities, interacting with Mapudungun-speaking groups there. On both sides of the Andean slopes, he encountered a number of Mapuche groups as well, most likely speaking a predecessor of today's Pehuenche (Dialect IV). In sum, Havestadt was probably most influenced by the northern varieties of the language, although he was no doubt aware of dialectal differences, having experienced all three major dialect forms (north, central and south). By 1756 he had retired from active service due to health issues, staying in Chile until 1768, when he travelled to Lima for some time, to later return to Westphalia in 1770.

5.3.1.2 Febrés *Art* (1765)

The second eighteenth-century grammar was that of a Catalan Jesuit, Andrés Febrés (1732-1790), who arrived to the Mapuche-speaking territories in 1759 at the age of 27. Somewhat younger than Havestadt, he appears to have learnt the language and written his grammar less than five years after his arrival in Chile. There is good reason

to believe, however, that Febrés came into contact with Havestadt's *Chilidúgu* – in Spanish manuscript form – well before reaching the country (see Lenz 1895-1897: XLI-LI, and Havestadt 1777: 189), alongside a copy of Valdivia's grammar. This would have given him a head start in the learning process. As a result, however, his work must be considered to be less original as compared to Havestadt's. Febrés' grammar was, nevertheless, published before that of his German brother of the cloth, and is much more condensed. It was therefore used on a wider scale in the training of new missionaries. Another point in which Febrés's grammar outdoes that of Havestadt – particularly important for our purposes – is in its care in transcribing the sounds of the language, as is shown by abundant comment on pronunciation matters and exemplification.

This abundance of exemplification in Febrés's grammar shows an important trait of the younger Jesuit's work as compared to his senior, German brother. Febrés was particularly concerned in matters of education of the Mapuche. In a note concluding his version of the *Christian Doctrine*, he says that one of his intentions is to publish a collection of *Thoughts* by one Fr. Bours, in Mapudungun 'so that the little Indians [los indiecitos] have somewhere to learn to read their own tongue' (294). As patronising as the language may sound today, the notion of teaching the natives to read and write was a very forward-thinking one, which contrasts with Havestadt's decision, for instance, to publish his work in Latin.

Another case where Febrés shows his keenness to exemplify, is in the publication of two dialogues in Mapudungun, one based on a relatively informal conversation, and the other in the manner of formal speeches (in this case a salutation) called *Coyaghtun* (99-145). This material provides some invaluable data for our purposes overall, not only for the fact that it is the first published text that seems to be the product of real native speakers, but also as it makes a point of showing that words ending a clause in the

formal language have final stress, which he goes so far as to mark in the transcription. We will return to this point when analysing Febrés proposed stress rules (cf. §5.3.2.2).

As regards the question of the dialects that are reported in his Art, Glossary (*Calepino*) and Texts, there is little explicit data. The major exception to this are the comments that Febrés himself includes at the beginning of his glossary and which Lenz compiles in order to establish a chronology of the work's composition (1895-1897: XXXIII-LI). It appears that, in the five years in which Febrés grammar was likely composed he was first stationed in the town of Angol for two years, and later in Imperial, for three. In contemporary accounts these locations are in in the northern and central varieties, respectively (dialects II and V in Croese 1980, cf. Fig 1.2). The final drafts are most likely to have been made in Santiago, where Febrés appears to have been stationed as a teacher in the local Jesuit school, San Pablo. By this time, however, it is unlikely that Mapudungun was spoken widely in a variety native to the area of Santiago.

In short, then, Febrés was exposed to both northern and central varieties of Mapudungun. In terms of the actual forms that he presents, we see that he is aware of some differences. He mentions that the pronunciation of alternating [v], [β] and [f], 'should in all rigour be with [v]', though he tells us that the second form is used in the north, while [f] is used 'towards Valdivia' (5). He also mentions that he has had to adapt the writing system of the glossaries he has had access to. One of these, of course, was Valdivia's *Vocabulario*. He also says he had access to two more recent glossaries which are not extant today: one from the region near Angol and Imperial (central variety) by one Fr. Diego Amaya, and the other from the island of Chiloé (southernmost variety) by Fr. Gaspar López (cf. 422-423). The nature of the adjustments he made, and the actual forms that came from each of the glossaries, however, are not specified.

5.3.2 Stress assignment data in Havestadt and Febrés's grammars

In terms of the presentation of verbal morphology and its meaning, Febrés and Havestadt both follow Valdivia quite closely, and hence, their analysis falls in with that set out in §5.2.1 above. As for the issue of stress assignment, Havestadt and Febrés' grammars differ in their presentation, with the first proposing a list of different categories of words which are stressed on the ultima and the penult, and the latter providing a general rule and a series of principled exceptions. The actual instantiation of these approaches, however, tends to converge, assigning stress to the same syllables. In the following sections we present each of the Jesuits' versions, starting with Havestadt, which appears to be composed earlier, even if published later.

5.3.2.1 Stress assignment in Havestadt's *Chilidúgu* (1777)

Although for our purposes it is rather unhelpfully condensed, Havestadt takes some pride in his account of stress spanning little more than one page (of the 950 of the entire text).[16] All in all, however, the picture that this grammar presents of stress is far more detailed than that which we find in Valdivia's. According to such a picture, stress can fall on either of the last two syllables of words. In most cases, Havestadt tells us that stress is predictable, however, he also claims that those forms that do not make it onto his list are either ambiguous or 'according to taste' in their placement of stress (*op cit.* 19-21).

[16]Following his account comes the exclamation: *Prosodiam universam in una sola pagina!* (Havestadt 1777: 21).

(5.12) Words having their accent on the ultima (Havestadt 1777: 19-21) – glosses and stress-marks added:

i. all first persons in indicative and optative tenses:[17] e.g. *elú-n* 'give- IND.1.S', *elu-bú-n* 'give-BI-IND.1S',[18] *elu-ujé-n* 'give-PERF-IND.1S', etc.,

ii. passive participles in *-el*: e.g. *elu-él* 'give-NOM', etc.,

iii. accusative gerunds which don't have the particle *-bi* inserted: e.g. *elu-ám* 'give-PURP' [19]

iv. all impersonals: e.g. *pi-ám* 'say-PURP', etc.,

v. all verbs ending in *-móm* or *-múm*,

vi. all infinitives, both affirmative and negative: e.g. *elú-n* 'give-INF', *elu-nó-n* 'give-NEG-INF', *elu-uje-nó-n* 'give-PERF-NEG-INF', etc.,

vii. verbs that end in *-úm*,[20]

viii. all persons of the verb inflected with *-bín* or *-bí*, namely the first and third persons e.g. *elu-bí-n* 'give-3SP-IND.1S, *elu-bí* 'give-3SP.IND.3.S',[21] etc.,

ix. abstract nouns: just like the first persons in the passive e.g. *ʧe-mo-ŋé-n*

[17]Like Valdivia, Havestadt claims that Mapudungun has an 'optative mood', which at times relies on forms of the indicative, at times of the subjunctive and yet at others, on forms of the imperative. All of these forms may express condition in the correct context and adding specifiers of evidentiality and aspect. From a practical standpoint, here the optative appears to be identical to the indicative.

[18]As in the case of Valdivia's grammar, the letter ⟨b⟩ is the ⟨f⟩ of present day accounts of central Mapudungun. Interestingly ⟨b⟩ is given by Havestadt for syllable onsets, while ⟨v⟩ and ⟨f⟩ are given in the coda. There is good reason to believe that /b/ (or, most likely /β/), /v/ and /f/ alternated in the language during the eighteenth century (Hasler & Soto 2012), as they do today in northern dialects (Salamanca 1997; Salamanca & Quintrileo 2009).

[19]Although early grammars describe the suffix *-am* as a gerund, Salas (2006: 167-9) and Zúñiga (2006b: 149) refer to it as an aspectual marker adding purpose or finality to an action.

[20]Though Havestadt terms this suffix an 'ablative gerund', it seems to be the temporal marker '*-ɟim*' (see the listing for the form '*-ɟim*' in Appendix B), which is made more plain by the fact that he mentions that there is an euphonic ⟨i⟩ (most likely [j]) preceding it when the previous segment is a vowel.

[21]As in a number of contemporary accounts, when the 3SP suffix *-fi* is followed by the IND.3.S marking /I-∅-I/ they are not marked. We presumed this is the case for Havestadt's grammar as well. The phonetic existence of a final glide is difficult to determine, however, evidence points strongly towards the existence of a closing segment, as we shall see below.

'person-be-PASS-INF = humanity', *elu-ŋé-n* 'give-PASS-INF = givennes', etc.,

x. all nouns having at the end the 'special *u*' (i.e. [ɨ]) after another vowel: e.g. *ujáɨ* or *uɨáɨ*.[22]

xi. Nouns ending in the consonants /r/, /f/ and /v/ e.g. *uʈ̪sár* 'seed', *tʃoʎóf* 'cavity', *wív* 'queue' etc.

(5.13) Words having their accent on the penultimate (Havestadt 1777: 20):

i. the second person singular and the second and third dual and plural forms: e.g. *elú-i-m-i* 'give-IND-2-S', *elú-i-m-u* 'give-IND-2-D', *elú-i-ŋ-u* 'give-IND-3-D', *elú-i-m-n* 'give-IND-2-P', *elú-i-ŋ-n* 'give-IND-3-P'.[23]

ii. all the tenses of the subjunctive: e.g. *elú-l-i* 'give-SUBJ-1S', *elú-l-m-i* 'give-SUBJ-2S', *elú-l-e* 'give-SUBJ-3S', etc.

iii. first singular and second plural of the imperative: e.g. *elú-chi* 'give-IMP.1S', *elú-mn* 'give-IMP.2P',[24] etc.

iv. gerunds with the particle *-bɨ*: e.g. *elu-bí-um* 'give-3SP-TEMP', etc.

v. participles both active and passive in *-lu*: e.g. *elú-lu* 'give-SVN', *elu-ŋé-lu* 'give-PASS-SVN', etc.

vi. nouns and adjectives that are disyllabic, ending in a vowel: e.g. *éʎa* 'not much', *núa* 'sly', *vóro* 'bone', *tʃáo* 'father', etc.

vii. verbs that in the first person singular indicative and the infinitive end in two consonants, but may have an *i* (pronounced sometimes *ɨ*, sometimes *e*) before the final *-n*: e.g. *kím-n* 'know-INF'.

[22]No translation for these forms was found. The first, appears to be *wija* 'yesterday', but no other documented form with final *ɨ* is found in the literature. We assume that the last two vowels form a heavy syllable.

[23]Although the forms are given with [i] marking the indicative, Havestadt explicitly claims that [i] surfaces as [j] (⟨y⟩) after vowels. Cf. fn. 26 for further details.

[24]An epenthetic vowel is assumed between the final consonants, following rule (vii) below.

Nominal and adjectival stress: Rules (5.12xi) and (5.13vi) give us a clear pattern for nouns and adjectives: stress the ultima if it is closed, otherwise, stress the penultimate syllable. Although no mention is made either of nouns ending in nasals and laterals – which are common in the language – or of the behaviour of words longer than two syllables, we assume that the same pattern may apply throughout.

A more puzzling issue, however, is that of Rule (5.12x), for which we are unable to match example forms directly to item's in Havestadt's own glossary or any other list of words, for that matter. We are furthermore, unable to find a vowel-[i̯] sequence at the end of a word elsewhere in descriptions of the language. It is likely that Havestadt is referring to glide-final forms, in which case, the rule falls in with (5.12xi) (see Table 5.7.d).

The rules for nouns, therefore, are clearly at variance with those of the preceding grammar in that Valdivia seems to present a quantity-insensitive system, while Havestadt seems to lean towards a system where final closed syllables attract stress. Although the data is not complete, it seems a reasonable assumption that in the period and dialects that Havestadt describes monomorphemic noun stress falls on a right-aligned moraic trochee.

Table 5.7: Stress in nouns according to Havestadt (1777) – right-aligned moraic trochees

	Final syllable open		Final syllable closed
	(x .)		(x)
a.	*é. ʎa*	b.	*u. ʈ̪sár*
	'not much'		'seed'
	(x .)		(x)
c.	*tʃá. o*	d.	*mu.θáj*
	'father'		'wheat beverage'

Verbal stress: Rules 5.12i and 5.13i-iii account for the basic pattern in finite verbs in the indicative, the subjunctive and most of the imperative.[25] In the vast majority of the paradigms, the account seems consistent with that of nouns: stressing the final if closed, and the penultimate if open. The only exceptions seem to be the first person dual of the indicative and the first person plural of the subjunctive.

Table 5.8: Stress in verbs with vowel-final roots (Havestadt 1777) – Example: *elu-n* 'to give'

INDICATIVE	1st	2nd	3rd
Singular	*elú-n*	*elú-jmi*	*elú-j*
Dual	*elu-jú**	*elú-jmu*	*elú-jŋu*
Plural	*elu-íŋ*	*elú-jmɨn*	*elú-jŋɨn*
SUBJUNCTIVE			
Singular	*elú-li*	*elú-lmi*	*elú-le*
Dual	*elú-lju*	*elú-lmu*	*elú-lŋu*
Plural	*elú-liŋ*	*elú-lmɨn*	*elú-lŋɨn*
IMPERATIVE			
Singular	*elú-tʃi*	—	—
Dual	—	*elú-mu*	*elú-ŋu*
Plural	—	*elú-mɨn*	*elú-ŋɨn*

The stressing of the final open syllable of the indicative first person dual (marked '*'), which corresponds to a case of 'all first persons in the indicative' (5.12i), seems to be an overgeneralisation of Havestadt's rule. Especially looking at the data from Valdivia and Febrés' grammars, final stress in this case would be extremely odd, since it would fall on a final open syllable (*-jú*) as well as a clearly decomposable number-marker (*-u* 'D', see §3.4.1.1). We assume, therefore, that the dual – which would have been the least familiar to a speaker of German and Spanish – was slightly overlooked as regards stress. It is assumed here that stress falls on the last vowel before person and number marking (i.e. *elú-j-u* 'give-IND.1-D'). The exception that does seem to hold is that of stressing the penultimate syllable in the first person plural subjunctive,

[25]Havestadt's description does not include the dual and plural of the first person imperative or the singular of the second and third person of the same mood.

even when the final is closed. This is a claim made by Febrés as well, and we will see that there are some arguments in its favour (see §5.3.3).

Note that we have also given the final syllable of the third person singular as stressed, even though it is not explicitly mentioned in the rules in 5.12. Not only is this coherent with Febrés's claims (cf. §5.3.2.2, below), but it falls in with the outcome of rule 5.12viii, where the third person singular takes final stress. It is our claim that both the *-bi* (or *-fi*) and the *-i* final forms have a weight adding glide that attracts stress to the final. The [i] ∼ [ij] alternation is explicitly mentioned by Febrés, and fits in with our agglutinating analysis of Mapudungun inflection (see §3.4.1.1 and 5.26, below).

The case of consonant-final roots, in particular in the indicative, is radically different from what we find in the early seventeenth century. If we consider that, in most forms, the penultimate syllable peak is occupied by the indicative marker – in this case the syllabic form of the high front sonorant (i.e. [i], where in vowel-final forms it surfaces as [j])[26] – then Havestadt's assertion, that the second person singular and the second and third dual and plural are stressed penultimately, leads to the indicative marker being stressed.[27]

It is interesting to note that, although most other forms of the verb follow the weight sensitive pattern, there are some exceptions and variability. While the forms ending in *-el*, *-am*, *-mum* ∼ *-mom*, *-bin*, and *-ŋen* are stress-final and the forms ending in *-lu* are penultimate, there are still cases like *-um*, which although heavy, seems to alternate stress depending on the preceding segment (cf. 5.13vii; 5.12iv). We will return to these

[26]Havestadt tells us explicitly that the [j]∼[i] alternation for the indicative marker depends on whether it is preceded by a vowel, in which case it changes to ⟨y⟩ (1777: 26); however, in his transcriptions he never gives, for instance, ⟨yñ⟩ when following a vowel, so the rules of glide formation seem to be more of the type: create a vowel where it avoids tautosyllabic consonant clusters. Here we assume that the form surfaces as a vowel when between consonants, between a consonant and the word edge, or preceding a word-final consonant. Elsewhere, it surfaces as a glide. Note that this description is specific to the indicative marker and need not apply to the 1st person or the singular markers.

[27]In the 2nd and 3rd person plural, Havestadt (1777: 5) assumes that, although unwritten, there is a very brief vowel between the final consonants (⟨ù⟩, in his script, ⟨ɨ⟩ here) – see Rule vii in 5.13.

Table 5.9: Stress in verbs with consonant-final roots (Havestadt 1777) – Example: *konɨn*, 'to enter'

INDICATIVE	1st	2nd	3rd
Singular	*kón-ɨ-n*	*kon-ími*	*kon-í(j)*
Dual	*koní-ju*	*kón-ímu*	*kon-íŋu*
Plural	*kon-íɲ*	*kon-ímɨn*	*kon-íŋɨn*
SUBJUNCTIVE			
Singular	*kón-li*	*kón-ɨ-lmi*	*kón-le*
Dual	*kón-liu*	*kón-ɨ-lmu*	*kón-ɨ-lŋu*
Plural	*kón-liɲ*	*kón-ɨ-lmɨn*	*kón-ɨ-lŋɨn*
IMPERATIVE			
Singular	*kón-tʃi*	—	—
Dual	—	*kón-mu*	*kón-ŋu*
Plural	—	*kón-mɨn*	*kón-ŋɨn*

forms in our general discussion of stress in the period (5.3.3).

5.3.2.2 Stress assignment in Febrés's *Art* (1765)

The young Catalán Jesuit's procedure for describing stress is diametrically opposed to that of his German counterpart. For Febrés there is one rule governing stress assignment in default cases, followed by a series of exceptions.

(5.14) General stress assignment rule (Febrés 1765: 6):

> In polysyllabic words ending in a single vowel, stress the penultimate syllable. If the word ends in a consonant or a diphthong (*aw, ew, aj, ej,* etc.) stress the last syllable.

(5.15) Exceptions (Febrés 1765: 6-8):

i. The third person singular of the present indicative of verbs ending in two consonants (i.e. consonant final roots, e.g. *kon-* 'enter', *kon-n* 'enter-INF) are, nevertheless, stressed on the ultima (i.e. *kon-í*, not **kón-i*. Febrés suggests that this form alternates with *koníj*, with a final glide).

ii. The second and third person of the imperative, *-ŋé* and *-pé*, are always stressed.

iii. The first person plural verbs (ending in *-ɲ*) are not stress-final, but stress the penultimate (cf. *elú-i-ɲ*, **elu-í-ɲ* 'give-IND.1-S', but *kon-í-i-ɲ* 'enter-IND-1-P'). This is also the case for the first person dual subjunctive: *elú-l-i-u* 'give-SUBJ-1-D, *elu-vú-l-i-u* 'give-BI-SUBJ-1-D', 'participles' ending in the suffixes *-el*, and *-ɨm*; and other words ending in *-énew* and *-éjew* (transitions 3→1 and 3"→3').[28]

iv. Nouns with a final consonant preceded by [ɨ] are stressed on the penultimate syllable (*némɨl* 'word', *mámɨʎ* 'wood', *pélɨm* 'guest'), while verbs with final consonant preceded by [ɨ] may or may not stress the final syllable. The difference in stressability of [ɨ] in verbs depends on whether there the vowel surfaces consistently across the inflectional paradigm. If it is not always a part of the verbal paradigm, [ɨ] is not stressed (i.e. *kón-ɨn* 'enter-ind.3s' vs. *kon-í-m-i* 'enter-IND-2-S); if it is, stress falls on it when it is the final vowel before a consonant (cf. maŋkɨ́-n 'kick-IND-1S' vs. maŋkɨ́-j-m-i 'kick-IND-2-S' *op. cit.* 417-418).

An important additional piece of information is provided by Febrés with regards to nouns in particular phrasal and pragmatic contexts:

> When they speak in the tone that befits a speech, which they call *coyaghtun* [kojauqtun], all the words at which they make a pause are pronounced long [i.e. finally stressed], e.g. *deuma pepavin gami mapú, marimari ca Llancahuenú, Dios pile, pentuayu ca mitá,* etc. 'I have already come to see your land, oh Llancahuenu! If God is served, we shall meet again'; where they pronounce the

[28] This is the convention for marking inverse forms in (Zúñiga 2006b) and elsewhere. *-e-n-ew* may also be glossed as -IND-INV1S-3SP, and *-e-j-ew* as -IND-INV-3S-3SP.

> three words *mapu, Llancahuenu, mita* long, not because they are, but because they raise their voices further on these, and make a pause (1765: 8).

In the note that precedes his extended example of one such speech, he tells us:

> I warn here that all the words that have an accent mark on the final syllable and are followed by a star, denote that upon that final syllable and word they make a pause, raise their voice, pronouncing it as long and taking a breath for the next clause, which is the way to give a *coyaghtun* (1765: 145).

Upon closer inspection of the actual marking in the text (near 150 clauses) the vast majority of words marked for final stress are either monosyllables (*pí-n* 'call-IND.1S'),[29] disyllabic nouns, (*pajé* 'priest, father' *mapú* 'land'), and in words ending in a consonant, where stress is expected (*kɨθáw* 'work'; *kuŋɪfál* 'poor person', *ɨʃmén* 'rich person', *l̪av.kén̪* 'sea', *kɨme-a-j* 'good-FUT-IND.3'). The only exceptions are the proper names of the two main speakers, *Milla-levú* 'gold-river' and *Anca-temú* 'body-tree'[30]. Although the cases of final stress in these proper names are interesting, they can hardly be said to reflect the language's general pattern. The evidence seems to point, rather, to the fact that this alternation is mostly restricted to disyllabic nouns ending in a vowel.

Nominal stress: The nominal system seems unambiguous in following the same pattern described for Havestadt's data (cf. Table 5.7):

(5.16) Nominal stress in Febrés (1765) – right-aligned moraic trochees

- Stress a final closed syllable,
- otherwise, stress the penultimate syllable.

[29] Interestingly, postpositions such as *mew* are often stressed when final, as are particles such as *ve*, which is described as interrogative or ornamental. Demonstratives and pronouns also appear in the clause-final position having stress on their only full vowel: cf. *tvá* ∼ *tɨfá* 'this, thus' *éŋn* ∼ *éŋɨn* 'they two'.

[30] Specifically the *blepharocalyx cruckshanksii* or *temo* tree.

We assume that the cases with [ɨ] between the final two consonants of a noun (see 5.15iv) have an epenthetic vowel which is not stressed, most likely being inserted after stress has been assigned (much as in 5.6, p. 234).

The phenomenon of stress shifting in formal speech – if described correctly by Febrés – seems to be a consequence of intonational processes. It is not difficult to imagine that Febrés perception of stress comes from an extreme pitch contour at the clause-edge (possibly a H*) in such spoken-discourse formulae (recall that pitch maxima were found to be the best correlates of PDM stress §3.2.1.2). It seems interesting, however, to ask whether this L2 interpretation of final stress in these forms would have been perceived as such by native speakers, or whether they would have simply seen these phenomena as changes in the language's intonation-contour. The fact that the pattern is found almost exclusively in disyllables will be key to our understanding of the later development of stress in the language (cf. §5.5)

Verbal stress: Febrés' description covers the entire indicative, subjunctive and imperative paradigms, for both vowel- and consonant-final roots. The former are nearly identical to the description provided by Valdivia (1606), while the latter differ from Valdivia in the indicative. In the vast majority of cases, Febrés agrees with Havestadt, the indicative marker being stressed interconsonantally. The major exception to this is the first person plural, where Havestadt places stress on the final syllable, while Febrés places it on the penultimate.

In the example paradigms given below, the vowel *ɨ* is given between consonants creating word-final consonant clusters, which are never stressed. This follows Febrés own description (5.15i,iv) and will be formalised below (§5.3.3) as epenthetic vowels added at the post-lexical level that, therefore do not interact with stress-assignment rules.

Overall, the rule is identical to that of the nouns: stress a right-aligned moraic trochee. Where this rule is not upheld, stress falls on the last pre-OFI (i.e. stem-final) vowel.

Table 5.10: Stress in verbs with vowel-final roots (Febrés 1765) – Example: *elu-n* 'to give' (exceptions to general rule shaded)

INDICATIVE	1st	2nd	3rd
Singular	*elú-n*	*elú-jmi*	*elú-j*
Dual	*elú-ju*	*elú-jmu*	*elú-jŋu*
Plural	*elú-iŋ*	*elú-jmɨn*	*elú-jŋɨn*
SUBJUNCTIVE			
Singular	*elú-li*	*elú-lmi*	*elú-le*
Dual	*elú-lju*	*elú-lmu*	*elú-lŋu*
Plural	*elú-liŋ*	*elú-lmɨn*	*elú-lŋɨn*
IMPERATIVE			
Singular	*elú-tʃi*	*elu-ŋé*	*elu-pé*
Dual	*elú-ju*	elú-mu	*elú-ŋu*
Plural	*elú-iŋ*	*elú-mɨn*	*elú-ŋɨn*

Febrés's description provides a view into the stress of forms for which Havestadt's grammar provides no data. Key among these are the second and third person singular of the imperative, *-ŋe* and *-pe*, which Febrés gives as bearing stress, contradicting the general rule. The other forms that Febrés claims not to follow the general rule are the first person plurals of all moods, which are penultimately stressed. This claim is consistent with Havestadt's for the subjunctive. Although the imperative is not given in the German's grammar, the indicative form is claimed to be stress-final, contradicting Febrés claim, at least for vowel-final roots.

The cases of stressless final *-el* and *-ɨm* in non-finite verbs, and *-ew* (in the transition markers *-ejew* and *-enew*) are odd. It is likely that the case of -ɨm is the same of Havestadt's *-um* (probably *-jum* in today's grammars), for which the German grammarian claims some alternation in stress (cf. 5.13vii 5.12iv). The lack of consistency between Havestadt and Febrés with regards to *-le* (stressed in the first, unstressed in the latter)

Table 5.11: Stress in verbs with consonant-final roots (Febrés 1765) – Example: *konɨn*, 'to enter' (exceptions to general rule shaded)

INDICATIVE	1st	2nd	3rd
Singular	*kón-ɨ-n*	*kon-ími*	*kon-í(j)*
Dual	*kón-ju*	*kón-ímu*	*kon-íŋu*
Plural	*kón-iɲ*	*kon-ímɨn*	*kón-íŋɨn*
SUBJUNCTIVE			
Singular	*kón-li*	*kón-ɨ-lmi*	*kón-le*
Dual	*kón-liu*	*kón-ɨ-lmu*	*kón-ɨ-lŋu*
Plural	*kón-liɲ*	*kón-ɨ-lmɨn*	*kón-ɨ-lŋɨn*
IMPERATIVE			
Singular	*kón-tʃi*	*kon-ŋé*	*kon-pé*
Dual	*kon-íju*	*kón-mu*	*kón-ŋu*
Plural	*kón-iɲ*	*kón-mɨn*	*kón-ŋɨn*

might also be due to some synchronic alternation, as may well be the case for the indicative first person plural (Havestadt *kon-í-ɲ*, Febrés *kón-i-ɲ*). In the transitional cases, Febrés seems to agree with Valdivia (Havestadt gives no information on stress in these forms), stressing the marker of the transitional form (*-e*), at least in the two forms that are presented.

We note then, that in all these forms, where stress does not follow the general rule (which effectively stresses the penultimate mora), it seems to revert to what we find in the previous stage (i.e. Valdivia's grammar, cf. §5.2.3): stress on the last vowel before mood, person and number marking (or before the non-finite morpheme that occupies the same morphological slot). The only exception are imperative *-ŋe* and *-pe*. Furthermore, for a number of the cases, stress seems to alternate between the stem-final vowel and the penultimate mora of the word.

(5.17) Verbal stress in Febrés (1765) – right-aligned moraic trochees
- Stress a final closed syllable,
- otherwise, stress the penultimate syllable.

- Exceptions:
  - Inverse forms, 1st person plurals, and non-finite verbs may have stem-final stress.
  - *-ŋe* '-IMP.2S' and *-pe* '-IMP.3S' forms are stress-final.

5.3.3 Formal account: Mapudungun stress assignment in the mid-eighteenth century

Havestadt's claim that many words are simply 'ambiguous or according to taste' as regards stress (1777: 20), appears to be symptomatic of a system in flux, though an appropriate linguistic generalisation is needed to restrict and explain the variation. The phrasal and pragmatic phenomena described by Febrés may be partially responsible for Havestadt's observations, but the inconsistencies between the two grammarians point to other factors that are unstable within the system.

Clearly, Febrés's general rule has too many exceptions to be surface-true. Havestadt, on the other hand, states no rules, just a list (and an incomplete one at that!) of final and penultimately stressed word-categories. From a strictly synchronic point of view, we may endeavour to explain stress assignment as a surface phenomenon; however, the interaction of stress with epenthesis in both verbs and nouns (which we have suggested already), as well as the exceptions in the stressing of final closed syllables, and the stressing of final open *-pe* and *-ŋe*, immediately requires a deeper level of representation.

5.3.3.1 Nominal stress in the mid-eighteenth century

In stark opposition to Valdivia's grammar, the two grammars composed a century and a half later converge in order to describe a weight sensitive system. Where nouns in Valdivia's grammar could be described as stressed on a right-aligned syllabic trochee,

Havestadt and Febrés's grammars present nouns as having stress on a right-aligned moraic trochee.

Febrés's claims regarding nouns ending in two consonants (5.15iv),[31] which may be pronounced with a brief, unstressed *-ɨ* between them, requires a rule of epenthesis. This rule may be formalised as follows:

(5.18) Nominal epenthesis in the mid-eighteenth century:

$\emptyset \rightarrow$ [ɨ] | VC ___ C_1#

Since the rule appears to be somewhat gradient and a matter of how 'correctly' the word is pronounced, we assume that it is post-lexical in nature. If footing and stress assignment are lexical and, effectively ordered before epenthesis, we derive stress in nouns without any major issues.

Table 5.12: Sample derivations for nominal stress assignment in mid-eighteenth century Mapudungun – moraic trochees and interconsonantal epenthesis

		(a.) /ɨʈ̪sar/ 'seed'	(b.) /voro/ 'bone'	(c.) /mamʎ/ 'wood'
Word	Foot, Stress	* ɨ.(ʈ̪sar)	* (vo.ro)	* (ma.mʎ)
Post-Lexical	Epenth	—	—	* ma.mɨʎ
Surface		[ɨʈ̪sár]	[vóro]	[mámɨʎ]

Though we do not formalise the rule here, a phrasal, post-lexical rule could apply to nouns at the edge of a clause in formal speech, accounting for the patterns that Febrés mentions in his *coyaghtun* data (cf. p. 253). Whether this is an actual stress-rule or simply an intonation rule that affects the percept of stress is impossible to know at this stage.

[31] Although Havestadt does not deal with nouns displaying this pattern, he does identify what is fundamentally the same pattern for verbs. See Rule (vii) in 5.13, above.

5.3.3.2 Verbal stress in the mid-eighteenth century

For the most part, the verbal system is in line with the nominal one, stressing the penultimate mora of the word. Aside from the case of the portmanteau imperative morphemes *-ŋe* and *-pe*, which – as in the previous stage of the language (§5.2) – are stressed, we find no other cases of final open syllable stress. Final closed syllables usually attract prominence, although there are some exceptions. In such cases, stress reverts to the stem-final syllable, which is the last vowel preceding mood-marking. If we consider epenthesis to be an independent process, which does not interact with stress (as in nouns), verbal stress always falls within the final two-syllables of the word.

Table 5.13: Penultimate mora stress and exceptions in mid-eighteenth century verbs

	Penultimate mora stressed		Exception 1: final vowel stress		Exception 2: stem-final stress
a.	*elú-n* 'give-IND.1S'	b.	*elu-ŋé* 'give-IMP.2S'	c.	*elú-∅-i-ɲ* 'give-IMP-1-P'
d.	*kon-í-m-(ɨ)n* 'enter-IND-2-P'	e.	*elu-pé* 'give-IMP.3S'	f.	*elú-l-i-ɲ* 'give-SUBJ-1-P'

As in the period of Mapudungun represented by Valdivia's grammar, the case of undecomposable *-ŋe* and *-pe* can be explained if we consider these suffixes to behave as independent prosodic words. Recall that the language seems to have no minimal word restrictions on single open syllables (cf. §4.3.5.1).

The subjunctive and imperative first person plural can be explained if we consider that the underlying form of the first person marker is non-syllabic (/j/), and that it only becomes a nucleus (/i/) at the level of post-lexical phonology, following stress assignment. This process of vocalisation would then occur at the same level as epenthesis. The first person plural of the indicative (/elu-i-j-n/ > [e.lu.iɲ], 'give-IND-1-P'), on the other hand cannot be considered to follow the same pattern, since, even if the marker of the first person cannot be stressed, the indicative marker ought to be, as it is in

other forms of the paradigm. In the absence of any better evidence for the indicative marker to be underlyingly syllabic or non-syllabic, we propose that it is underspecified for this feature (⟨I⟩) and that it is only as a result of the syllabification algorithm that it surfaces with either feature (see 5.19, below).[32]

The fact is, however, that stress on the indicative marker of the third person plural is only missing from Febrés grammar, while in Havestadt, rule 5.12i has it bearing stress. Although it is possible that there is a dialectal difference in the forms provided in the accounts[33] it is more likely there is some synchronic alternation between stem-final and penultimate mora stress, especially where the morphological structure is somewhat opaque due to phonological merger and analogy with other -1P forms would render the final syllable unstressed.

Regardless of this conflation of predicted word- and stem-edge stress, the final syllable of the stem appears to be the preferred locus for stress shifting. Some cases of this shifting are non-finite *-(j)ɨm* and *-el* sometimes surfacing as unstressed, and the inverse marker *-e* being stressed.

Table 5.14: Stem-final vs. penultimate mora stress in Havestadt and Febrés

	'give-3SP-TEMP'	'give-TEMP'	'give-NOM	'give-INV-IND.3-3SP
Havestadt	*elu-bí-(ɨm)*	*elu-(jɨ́m)*	*elu-(él)*	—
Febrés	*elu-bí-(ɨm)*	*elú-(jɨm)*	*elú-(el)*	*elu-é-(j-ew)*

It is our claim here, then, that the stem-final syllable does have some degree of stress, which is normally secondary to the stress on the penultimate mora of the word. This would imply that, in building the verb's morphological structure, stress assignment rules are applied twice, once to the stem and once to the word.

[32]For the case of the singular marker – also a high front sonorant (§3.4.1.1, 5.2) – it seems difficult to determine whether it is underlyingly syllabic or not. We assume that it patterns with the description for the indicative marker, as we have in the contemporary account.

[33]Recall that Febrés spent more time in areas that were further south, in the areas of present day central Mapudungun, which may mean a more conservative dialect i.e. tending to stress the stem.

Having no data for claiming any other position but final stress in stems (as we do in the case of light-final trisyllables in contemporary compounds Table 4.4), or any cyclic effects of stress assignment therein (as we do in the case of maximally prominent derived stems in present day Mapudungun §4.3.2) a reasonable synchronic assumption is that stress is assigned once at the end of the stem-building process, following a purely morphological rule: stress the stem-final syllable.[34] At the word level, the mood, person and number marking would be added, footing a trochee at the right edge, which in turn would be stressed on its head element, demoting the previous level's stress. In the case of derivational morphology, this would be added after stress assignment, thus leaving morphemes such as *-(j)ɨm* and *-el* (as well as *-lu*), effectively unstressed. The rules that are needed in order for this account to hang together are given in 5.19.

(5.19) Verbal stress assignment in mid-eighteenth century Mapudungun:

1. Syllabification (Syllab):
   (a) Parse a domain into syllables from left to right. Create nuclei using no more than one vocalic segment. In series of consonants, prioritise the creation of a mono-segmental onset. Remaining consonantal material may be syllabified in the coda.
   (b) For the case of high sonorants underspecified for syllabicity (in particular /j∼i/ or ⟨I⟩), parse as a nucleus when the sonorant is not directly adjacent to another nucleus, or when preceding a single word-final consonant. Otherwise, parse as a glide.[35]
2. Footing (Foot): Build moraic trochees aligned to right edge of the word. Where the minimum of two moras is not available, build a single monomoraic

[34] Although other accounts of this phenomenon are possible (among them footing an iamb in the stem and a trochee in the word, or iambs throughout, with word-final extrametricality), the data is too sparse to be considered exclusively from a synchronic standpoint, so we assume that there is no radical departure from the previous and following stages, all of which are trochaic.

[35] The rule can also be given as: I → i | C __ C ; __ C# — Elsewhere: I → j

foot.[36]

3. Prominence Assignment (Prom): Assign a prominence mark to the final syllable of stems and to the heads of feet.
4. Clash Avoidance (no-clash): Add a further prominence-mark to the rightmost of two adjacent syllables marked at the same level of prominence.
5. Vocalisation (Vocal): Treat underlying glides as nuclei on the surface if they surface intervocalically or between a consonant and the right edge of a word.
6. Epenthesis (Epenth): Break up a series of two or more consonants in the coda of a syllable by inserting a /ɨ/ or /ə/ before the final consonant.
7. Glide deletion (GD): Delete a coda glide in a homorganic vowel-glide sequence.

Rules (1) and (3) in 5.19 apply both at the stem and at the word level, while rules (2) and (4) apply only to the latter. Rules (5) to (7) we assume to be post-lexical, as their application is somewhat gradient and they do not interact with stress assignment rules (2) and (3). Finally, rule (4) may apply once again at the post-lexical level to resolve clash created through concatenation of prosodic words. In the following derivation tables, we provide concrete examples of the application of each of the rules.

The derivations in Table 5.15 show two levels of morphological structure-building, one at the stem level, and the other at the word-level. Stress is assigned at the end of each one of these. For the case where the non-finite markers *-el* and *-(j)ɨm* are unstressed (or variably stressed) we assume that they are added after stress assignment has occurred at the word level. In the case of the stressed portmanteau morphemes *-pe* and *-ŋe*, we assume that they are separate prosodic words throughout, thus receiving

[36]The footing of a monomoraic foot applies to nouns and adjectives made up of a single open syllable, as well as verbal markers that act as independent prosodic words, such as imperative markers *-ŋe* and *-pe*.

Table 5.15: Example derivations for eighteenth century verbal stress

		(a.) /elu-bu-I-m-n/ 'give-BI-IND-2-S'	(b.) /kon-l-j-ɲ/ 'enter-SUBJ-1-P'	(c.)kon-I-j-ɲ 'enter-IND-1-P'
STEM	SYLLAB; PROM	* e.lu.bu	* kon	* kon
WORD	SYLLAB; FOOT PROM; NO-CLASH	* e.lu.(bujmn)	* (konljɲ)	* * * ko.(nijɲ)
POST-LEXICAL	VOCAL; EPENTH GD	* e.lu.buj.mɨn	* kon.liɲ	* * * ko.niɲ
SURFACE		[elubújmɨn]∼ [elubújmn]	[kónliɲ]∼ [kónljɲ]	[kòníɲ] ∼ [kòníjɲ]

stress at a par with the stem of the verb. The case of the 3rd person singular indicative following a consonant does not fall in with these cases of a final light syllable being unstressed, but we assume are heavy syllables that may lose a final glide at the post-lexical level. As is the case for epenthesis and vocalisation, this is most likely a gradient process, as is made explicit by Febrés (5.15i).

5.3.4 Summary of mid-eighteenth century stress assignment

The picture we present of stress in this period is in many ways similar to what we find in our present day account (Chapter 4). The most important similarity is the practically exceptionless footing of a right aligned moraic trochee at the word level. This is particularly true for the nominal system, excepting the cases with variable stress in PDM. The second similarity is the tendency to stress the stem-final vowel in verbs. One of the major differences, however, is the fact that what appears to be the stem domain in the eighteenth century (and in the early seventeenth as well – all verbal morphology excluding mood, focal person and number marking, the OFI) is

Table 5.16: Non-surface true moraic footing in eighteenth century verbal stress

		(a.) /kon-ɨm/ 'enter-TEMP'	(b.) /kon-ŋe/ 'enter-IMP.2.S'	(c.)kon-I-∅-I 'enter-IND-3-S'
STEM	SYLLAB; PROM;	* kon	* * kon ŋe	* kon
WORD Level 2	SYLLAB; FOOT; PROM NO-CLASH	* kon	* * kon ŋe	* * * ko.nij
WORD Level 2	SYLLAB	* ko.nɨm	* * kon.ŋe	—
POST-LEXICAL	GF; NO-CLASH	—	* * * kon.ŋe	* * * ko.ni
SURFACE		[kónɨm]	[kònŋé] ∼ [kónŋé]	[kòní] ∼ [kòníj]

significantly different to what our data found for the stem-domain in the twenty-first century (root and core valency-changing suffixes, mostly, cf. §4.3).

It is proposed here that in Havestadt and Febrés's grammars, the stem morphology is added in one level, with syllabification, and prominence assignment applying to the entire stem. On the other hand, word-level morphology applies in two levels, the first of which adds mood, focal person and number marking, while the second adds some more derivational-type suffixes, such as the non-finite morphemes *-(j)ɨm* and *-el*. This second level is also likely to be the locus of compounding. In particular, although no mention of stress in compounds is made in Febrés and Havestadt, we do find structures resembling verbal compounds in the second and third person single of the imperative. Here the portmanteau morphemes (*-ŋe* '-IMP.2S' and *-pe* '-IMP.3S') are stressed as independent words. The post-lexical level may be responsible for the optional added prominence to the second prosodic word in such compounds, as well as for glide deletion, epenthesis and vocalisation.

The fact that in a number of cases in the verbal paradigm, predicted right-edge stress and the stem-final syllable are conflated, and that the preferred locus for stress in exceptional cases is this same stem-final syllable, has led us to assume some level of stress on this element. The account we have given of its stress – simply stressing the last syllable of the domain – is purposefully theory-neutral, as the data is too sparse to determine whether this position for stress is tantamount to the moraic trochee plus initial syllable extrametricality account we have given for the present day data. On the other hand, proposing an iambic system[37] seems far-fetched considering the consistency that is claimed for the nominal system and for the right edge of verbs.

Interestingly, considering the possible structures of mood, focal person and number suffixes, there are only two possible distributions for the verb's two stresses: conflation or clash. This less than ideal distribution of stresses, we venture, most likely led speakers, over time, to avoid clash by re-conceptualising the domains of the stem and word-morphology. We will ultimately see this reassessment of the stem-domain and the role of demarcative stress in the final historical works on the language, as well as in our own, twenty-first century data.

5.4 Rudolf Lenz (1896) and Félix de Augusta (1903): *Mapudungun stress at the turn of the twentieth century*

Towards the end of the nineteenth century, having taken over the remaining Mapuche territories, the fledging Chilean state was suddenly faced with the natives and their language as part of Chilean society. This, alongside the growing interest in popular culture and its place within the new national identity, brought about scholarly interest

[37]Such an account could apply either only to the right edge of the stem, or to the same edge both at word and stem levels. In the latter case, we would have to propose an extrametrical mora at the right edge of the word.

in Mapuche culture and language. In particular, the work of Rudolf Lenz, a German born linguist and philologist, opened up the field of Araucanian Studies to university academics. In parallel, the radical changes in Mapuche lifestyle as a consequence of their relocation on to *reducciones* was seen in ecclesiastical circles as a chance for renewed pastoral work, which would in turn require a more up-to-date account of the language, the vast majority of the heartland Mapuche still being monolinguals. The linguistic task was undertaken with vigour by a newly arrived contingent of Bavarian Capuchins, among which Fr. Felix de Augusta was the most dedicated and prolific.

5.4.1 Turn of the twentieth century Mapudungun studies

5.4.1.1 Rodolfo Lenz's *Estudios Araucanos* (1895-1897)

Rudolf Lenz, born in Halle an der Saale in 1863, studied Modern Languages (Romance and Germanic) and Indo-European Philology at Berlin and Bonn, obtaining his doctorate in 1886. He was hired by the Chilean government in 1889 as one of seven German academics brought in to bolster the newly formed Pedagogical Institute of the University of Chile. This institution, in turn, was meant to elevate the educational standards of Chilean schools through quality teacher training. Distinguished by 'his natural disposition for speaking foreign language with a national accent' (Escudero 1963: 450), Lenz was hired to lecture in French, English and Italian.

Based in Santiago from 1890 onwards, Lenz became immediately interested in the peculiarities of Chilean Spanish, which he described with unprecedented phonetic detail, documenting how far it had drifted from peninsular varieties. Key among his insights was the idea that the changes in Chilean Spanish were the result of contact with the languages native to the region before the arrival of Europeans, a viewpoint he presented in 1893 with respect to Mapudungun: 'The Spanish of Chile (that is, the lan-

guage of the lower folk) is basically Spanish with Araucanian sounds' (208). This view, known within Latin-American linguistics as the 'indigenist' theory, was discredited in the mid to late twentieth century in favour of views that trace New World varieties of Spanish to non-standard features of the language spoken in the Iberian Peninsula (cf. Salas 1996: for a summary). The indigenist theory, however, appears to be in process of reevaluation, at least for the case of Chilean Spanish (Ingeberg Klein 2008; Hasler & Soto 2012; Sadowsky 2012a). For Lenz, interest in the contact conditions of Chilean Spanish soon turned to independent interest in Mapudungun culture and language, and ultimately, to original fieldwork and linguistic analysis of the native language.

Lenz's work is far-reaching and crucial to the general reevaluation of popular culture and language in Chile. His main work on Mapudungun (*Estudios Araucanos*, published between 1895 and 1897) did not have a pedagogical objective (as did the missionary grammars), but rather attempted a formal, scientific description. Aside, perhaps, from the two 'dialogues' in Febrés's grammar, all previous transcriptions of Mapudungun had been translations from Spanish pieced together by the missionaries. Lenz complains that 'there was no document of some length that could be said to represent with certainty the naïve language of the Indian himself' (Lenz, 1919 *Sobre el estudio de idiomas* 'On the study of languages', cited in Escudero 1963: 458).

Attempting to remedy this situation, in the decade following his arrival to Chile, Lenz travelled widely in the Mapudungun-speaking territories, establishing relations with a number of informants near Collipulli (see Fig. 1.2, Dialect II in Croese 1980); Perquenco (Dialect IV); Cholchol and Nueva Imperial (Dialect VI); and costal areas further south (Dialects V and VII). In Santiago, he further established contact with a Huilliche speaker (Dialect VIII). Making detailed notation of stories, poems, speeches and dialogues, he reached a broad understanding of the dialectal distribution of the language, establishing the first systematic description thereof. The division (given in

Chapter 1 as well) separated out Huilliche, the southernmost variety, as being the most linguistically divergent and as practically unintelligible to other varieties. The northernmost dialects he termed *Picunche*, while central varieties were split between those spoken in the Andean foothills – Pehuenche – and those spoken in the central valley and costal areas of the province of Cautín, which he called *Moluche*, or *Ngoluche*.

Lenz's plethora of short studies providing transcription of monologues and dialogues, as well as brief speculative descriptions of isolated phenomena, lacked, however, a coherent synthesis. Furthermore, Lenz had only an academic grasp of the language, as opposed to the missionaries who had a practical knowledge of it, based on daily contact with native speakers. As a result, he had scant intuitions as to the phonemic nature of the sounds he described in his transcriptions or as to the grammaticality of syntactic structure (see Salas 2003: 26). Long after publishing most of his work on Mapudungun, Lenz – usually very confident in his knowledge of other languages – claimed that:

> With repeated exercise and some years of work, I have come to comprehend almost perfectly any text written in Araucanian; however, as I have never had, not even for a few weeks, the chance to practice the language with Indians, I hardly can, even today, understand a fast conversation. (Lenz, 1919 *Sobre el estudio de idiomas*, cited in Escudero 1963: 458).

It was Lenz's intention to publish a full grammar of Mapudungun, using the material from his *Estudios Araucanos* as the basic data. This work would have had both a diachronic and a synchronic element, as well as covering the linguistic system from phonetics to stylistics. Needless to say, this work would not have followed the scholastic patterns of preceding grammars but embraced the growing modern comparative linguistic tradition, among which he would have been particularly interested in following the descriptive methods of the Sinologist Georg von der Gabelentz (Lenz 1895-1897:

IX-XI). The grammar, however, never saw the light of day. We must gather what we can from the introductions, comments and texts themselves compiled in the published work on Mapudungun, as well as from a brief description of the language's morphosyntax presented in Lenz's most famous linguistic work *La Oración y sus Partes* 'The Sentence and its Parts', published in Madrid in 1920.

5.4.1.2 Félix de Augusta's *Gramática Araucana* (1903) and other works

The last and most complete of the missionary grammars of Mapudungun is that of the Bavarian Felix José de Augusta. Born in the city of Augsburg in 1860 as August Stephan Kathan, he studied medicine in Würzburg and then in Munich, where he obtained his doctorate. In 1887 he was accepted into the Capuchin order in Laufen, taking the name of Felix Joseph which was followed up by the name of his place of origin: von Augsburg. In 1890 he was ordained, and by late 1895 had joined the first mission of Bavarian Franciscans to the region of Araucanía.

Most of Augusta's work was done in the Huapi area, near the mouth of the Imperial River. Although the Capuchin mission house was located in Baja Imperial (today Puerto Saavedra, in Croese's Dialect V area), the missionaries would often spend their time visiting the surrounding communities. While Lenz was famous for his ability to perceive and reproduce fine-grained phonetic detail of the languages he learned, he himself admitted to lack of exposure. Augusta, on the other hand, was renowned for his unfailing dedication to the language in its actual usage, and his vast first-hand knowledge of it. A strong missionary vocation as well as his medical training were key in obtaining such unique intimacy with the Mapuche, their language and their culture.

> They [the Mapuche] would approach us with confidence in the different needs of their lives. We lived among them, we visited them in their homes, cured their sick and shared with them their joys and sorrows...

> We always had some natives as companions in our travels throughout the territories of the Mission, and, as we carefully wrote down each new term we heard, our notebooks would continue to fill up, one after another. ('Prologue' to the *Diccionarion Araucano.* Augusta 1916: IX)

Although the grammar, published in 1903 in the city of Valdivia, is Augusta's most explicit work on the language's structure, it should be taken as one of three elements – alongside his collection of texts, *Lecturas Araucanas* (Augusta 1910) and Dictionary (1916) – within a broader practical description of the language (Salas 1985).

The result of his first eight years of work in the communities, the *Gramatica Araucana* is perhaps the most manifestly 'pedagogical' of the missionary grammars, structured as a series of brief grammar points followed by examples and exercises, as was the model of the day for learner grammars. Such richness of example makes it a very valuable resource, especially in contrast with earlier ones, which tended to supply rules with scarce exemplification. Moreover, the grammar corresponds to a variety of the language spoken in what remains today as the heartland of the Mapuche territories in Chile's Eighth Region ('between the Cautín, Toltén and Maniyu rivers', Augusta 1903: VIII, Dialects V, III, VI and VII), as opposed to the earlier grammars which focus predominantly on northern dialects that are mostly extinct today.

Years after the publication of the grammar, in 1909, Augusta's travels took him to the region nearing the town of Panguipulli (Dialect VII area), where, with the help of Fr. Sigfriedo de Fraunhäusl, a variety of new materials were gathered. These, along with other ones from Huapi, and some of Augusta's own translations of evangelisation material which he checked with his native speaker informants, were published as *Lecturas Araucanas* in 1910. The original Mapudungun texts are of immense value both from an ethnohistorical and and linguistic standpoint, coming from a variety of sources that give a broad survey of Mapuche life at the turn of the century. Among the texts,

which are presented side by side with a relatively free translation into Spanish, are brief descriptions or instructions for native customs, local stories, formal prayers, speeches, dictated letters and songs.

Based on the materials from the texts in Augusta (1910), as well as continued travels and contact with informants from both Huapi and Panguipulli, in 1916 Augusta published the two volumes of his *Diccionario Araucano-Español y Español-Araucano*, the most complete dictionary available of the language to date.[38] Although Augusta had had access to a number of dialects of the language and most likely would have been able to draw from a number of other sources in order to include additional lexical items or regional variations,[39] he decided only to include material gathered in Huapi and Panguipulli, signalling clearly whether a form was exclusive to one or the other area. He goes so far as to say that 'we can guarantee that we have heard the words which appear in our work in use by the Indians' (Augusta 1916: VI).

The work of Augusta, though still shackled to the Scholastic model of grammar, is nevertheless considered by Adalberto Salas (1985: 267) to be the culmination of this approach as regards the study of Mapudungun.

5.4.2 Stress assignment data in the work of Lenz and Augusta

5.4.2.1 Stress assignment in Rodolfo Lenz's *Estudios Araucanos* 1895-7

Despite never fulfilling his intention to publish a grammar of Mapudungun (Ferreccio 1980: 9), Lenz's views on the phonetics and phonology of the language are sprinkled quite generously across his work. The most extensive account is given in the prologue to his collected articles on Mapudungun (Lenz 1895-1897), where, with regards to stress,

[38]Salas (1985: 163) estimates there are over 5,000 entries in the Mapudungun-Spanish volume, and over 7,000 in the Spanish-Mapudungun one.

[39]Not least among possible sources were the *vocabularies* of Valdivia, Havestadt and Febrés, which included heterogenous material with no clear reference to their geographical usage.

he states that it 'has little strength and stability, changing its place according to laws of balance that are scarcely fixed' (XXIV).

In his study of Mapuche song (*Estudios Araucanos X*), included in the same volume, he repeats this idea of weak and changeable stress, which he relates to the language's agglutinating character, the addition of morphology creating new contexts for the application of stress. He also tells us that in verse, stress clash is acceptable, as well as lapses of up to three syllables. Furthermore, he tells us that rhythm appears to be mostly trochaic, though some iambic organisation is visible as well. Unfortunately, Lenz delves no deeper than these comments and gives no examples of such footing. He claims simply not to have had enough exposure to the sung form of the verses, and, though he is sure there is rhythmic organisation, it appears to be variable (1895-1897: 388).

With regards to the general rules of stress in the language, we are left only with a footnote in the *Estudios*:

(5.20) Stress rule provided in Lenz (1895-1897, 388, fn.I):[40]

> 'In general, the rule established by Father Valdivia is still observed today: that Araucanian words are stressed on the penultimate syllable; only when ending in a consonant do they become acute [i.e. stress-final]'

In his earliest work on New World Spanish (*Beiträge zur Kenntnis de Amerikanospanischen*, 1893), Lenz also lays out the phonetics and phonology of Mapudungun, in order to claim that it acts as a substrate of the Chilean variety of Spanish. Here, with regards to stress, he is more precise than in the works having for their specific topic the Mapuche language:

[40] As we find no direct statement of this entire rule in Valdivia's grammar (see §5.2), it is likely that Lenz has confused Valdivia and Febrés' *Arts* (see §5.3.2.2), or that he was only referring to the first part of the rule as belonging to the Spaniard's authorship, having added the second half of the rule himself.

(5.21) Stress rule provided in Lenz (1893, 202):

> 'Stress varies in accordance with lexical combinations; in general, words ending in a consonant are stressed on the last full syllable (those which do not include ə), while simplex, polysyllabic words ending in a vowel, are stressed on the penultimate syllable.'

Unfortunately, in the songs, as well as in other transcriptions, Lenz gives no consistent stress marking. Furthermore, the best of his transcriptions – as regards stress – come from the Huilliche texts (elicited in Santiago from one Domingo Quintuprai, native of Osorno), which he himself sees as the furthest outliers among the known dialects. It is likely that these notes were taken with greater care for stress, as Lenz knew the dialect least, however, they must be considered with caution, as they are likely not to be the historical antecedents of the variety studied in our own data. The same is true for the Picunche texts (given by *Loŋko* ('chief') Juan Amasa from Collipulli), which also show frequent stress marking. The greatest body of texts are in the Pehuenche dialect (elicited from Domingo Jara, also known as Calvun), being, in general, very sparsely marked for stress (with the exception of the songs in *Study X*). We have only a few stress-marked words in the central dialect (Moluche, in Lenz's terms), most of which come from a song that a Mapuche by the name of Benito Naguin Trensao allowed Lenz to hear half an hour before the academics' departure from Cholchol, in 1897 (Lenz 1895-1897: 392).

Even though Lenz tells us that he has marked stress only where 'it appeared to me to have a certain added strength or an uncommon position' (1895-1897: 6), it is rare that such cases do not fall on the penultimate mora, as the general rule he has stated seems to imply. This is the case regardless of the dialect being described. It is interesting, however, that in some of these cases – in particular in the Pehuenche and Picunche texts – stress does surface on what he transcribes as a schwa in the final

syllable, perhaps a sign that it is no longer epenthetic, but has become part of the lexical representation of the word.

Table 5.17: Sample rightmost stress in the Lenz's Mapudungun texts, by dialect

MOLUCHE	PEHUENCHE	PICUNCHE	HUILLICHE
lamŋén (p.393)	*n̻amín̻* (p.230)	*votím* (p.95)	*kuʃín* (p.35)
'woman'	'foot'	'son'	'cattle'
tuku-ká-n (p.451)	*pi-rké-j* (p.399)	*mawɨ́-j* (p.47)	*uʈʂé-n* (p.42)
'plant-CONT-INF'	'say-REP-IND.3	'rain-IND.3'	'cold-IND.1S'
kon-á-j-u (p.393)	*je-me-rké-j-u* (p.399)	*wɨʈʂá-j-m-i* (p.99)	*muŋé-j-m-i* (p.33)
'enter-FUT-IND.1-D'	'bring-AND-REP-IND.1-D'	'wake-IND-2-S'	'live-IND-2-S'

The major exception to this are the – by now familiar – disyllables ending in a vowel. In the prologue to the *Estudios* Lenz exemplifies the 'scarcely fixed' nature of stress in words such as *ruka* 'house', giving the forms in 5.22 (a) and (b). Upon closer inspection, in texts corresponding to all language varieties it is the disyllables with a final open syllable that appear with stress in both positions, as we can see in examples (c) vs. (d), and (e) vs. (f).[41]

(5.22) Varying stress (underlined) in Mapudungun, according to Lenz (1895-1897):[42]

a. *təfá-mu* *məl-i* *ñi* *rúka* (p.XXIV)
DET-POST be-ind.3s my house
'Here is my house'

b. *ñi* *ruká-mo* *kəpá-n* (p.XXIV)
my house-from come-1S
'I come from my house'

c. *wuʈʂa-lá-j* *tʃi* *lóŋko.* (p.18)
stand-NEG-IND.3S the chief
'The chief did not stand up'

[41]Though we find few trisyllables marked for stress (most of them are borrowings from Spanish, such as *kawéʎu* 'horse' Sp.*caballo*), in the Pehuenche texts we find *kɨʎéɲu* 'tear', even when followed by *mew* (p.399). We claim, then, that trisyllables follow the main rule.

[42]Transcriptions have been adapted and parallel glosses added, the translation is an English version of Lenz's Spanish one.

d. *mɨle-fu kaθike, loŋkó* (p.18)
be-BI leader chief
'they were leaders, chiefs'

e. *və́ta kómpaŋé-n, vtá ka mápu* (p.393)
distant accompany-INF distant other land
'accompany me far, to a distant land'

f. *ámu-ka-á-j-u ka mapú, kompáŋ* (p.393)
go-CONT-FUT-IND.1-D other land companion
'I will go with you to another land, companion'

We note that, although the lack of stability is claimed for the language overall, the alternate position of stress on a final open syllable is restricted to two-syllable words, in particular, nouns. Clearly the forms that do not follow the general rule seem most common clause-finally, or preceding the postposition *mo/mew*, but this behaviour is not consistent for such a position, nor exclusive to it.[43]

The second position where Lenz consistently marks stress is on the indicative third singular marker after a consonant. (cf. Table 5.18) As elsewhere, these cases can be assumed to have two underlying high-front segments (i.e /-I-∅-I/ '-IND-3-S') which at some point of the derivation draw stress to the final syllable, a point we return to in the data for Augusta as well (cf. 5.27).

Table 5.18: Stress in indicative third person singular marking in Lenz (1895-1897, see 5.26 for detailed rules)

	UNDERLYING	SYLLAB.	STRESS	[j]-DELETE	Gloss	Page
a.	*/kim-I-∅-I/*	*kimɨj*	*kimíj*	*kimí*	'know-IND-3-S'	103
b.	*/ʦ̪áp-ɨm-I-∅-I/*	*ʦ̪ápɨmij*	*ʦ̪ápɨmíj*	*ʦ̪ápɨmí*	'join-CAUSE-IND.3.S'	24
c.	*/aju-fi-I-∅-I/*	*aju-fɨjj*	*aju-fíjj*	*aju-fí*	'like-3SC.IND.3S'	242

[43]Note, for instance the transcription *mápu-mo* in the Huilliche texts (p.34), and the position of stress in phrase-final *lóŋko* and *mápu* in 5.22 (c) and (e), respectively. Although rare, there are a few examples of disyllables transcribed with stress on a final vowel even when not phrase final. One example comes from the Picunche texts (p.97): *pɨtʃi mápu ruká mɨle-ka-j-a-j* 'bit earth house be-CONT-FUT-IND.3 (there won't be much distance to the house)'. It is possible, however, that the speaker placed an intonational break following the word *ruka*, which brought with it the change in perceived stress.

Finally, where they have their stress marked, adjectives, adverbs, pronouns and other function words are found to have final stress. In Moluche we find words like *muná* 'few' (p.475) and *fɨtá* 'distant' (p.399), as well as *kɨmé* 'good' (p.97), *wilé* 'tomorrow' (p.79) in Picunche, and *pɨtʃí* 'small' in Pehuenche. In all texts, we find *kɨŋé* 'one/DET' and *tufá* 'this' stressed finally. There are no cases where stress is explicitly marked on the first syllable of these word categories.

Although we have mentioned the explicit claims and exemplification regarding right-edge stress in Lenz's transcriptions, the question of additional stresses in longer words is not made explicit in his account, even though they are occasionally transcribed. In the vast majority of cases, these stresses are verbal and surface on the root-final syllable (cf. Table 5.19). The main exception to the rule is the single Moluche song we have access to and which Lenz transcribed hurriedly before ending his sojourn in Cholchol. In that text (p.393), the stress marking is made very explicit, following a perfect trochaic pattern.[44] Whether this corresponds to the actual rhythmic structure of the verses, or Lenz's reconstruction thereof, it is unlikely that the patterns he presents corresponds to the natural position of prominences in spoken language. Particularly odd is the fact that they surface on the first syllable of a disyllabic root (see 5.22e, f and Table 5.19).[45]

Table 5.19: Sample stem stress in (Lenz 1895-1897) by dialect

MOLUCHE (song)	PEHUENCHE	PICUNCHE	HUILLICHE
ámu-ka-á-j-u (393)	*kón-pa-tu-j* (137)	*t̪sepé-la-ŋé-l* (82)	*pé-me-fí-ŋe* (32)
'go-CONT-FUT-IND.1-D'	'enter-CIS-REST-IND.3'	'wake-NEG-NOM'	'see-AND-3SP-IMP.2S'
kómpaŋé-n (393)	*kón-me-ke-j* (214)	*ujém-tu-ví-ŋe* (84)	*kím-a-vú-j* (32)
'accompany-INF'	'enter-AND-HABIT-IND.3'	'light-REST-3SP-IMP.2S'	'know-FUT-BI-IND.3'
l̪ekáj-tu-á-lu (393)	*kón-pu-a-lu* (251)	*kím-ví-m-i* (102)	*at̪sún-kɨlé-n* (42)
'throw-REST-FUT-SVN'	'enter-TRLOC-FUT-SVN'	'know-3SP.IND-2-S'	'fatigue-PROG-IND.1S'

The consistency we find in the forms outside the forced moraic trochee of the

[44]Here we are referring to a trochee in the sense of poetic versification. In this sense, footing is quantity insensitive, falling on all odd syllables of the verse.

[45]Importantly, the forms we give for Pehuenche here are actually not explicitly marked for stress, but follow Lenz's mention (132-133) that stressed [o] is diphthongized in his informants fast speech, which he transcribes ⟨ᵘo⟩. We use this transcription as a diagnostic for stress.

Moluche poem,[46] give us an interesting insight into what appears to be the stress system of verbs throughout the explored dialects: stressing the root-final vowel. Of course, this is a feature we find both in the earliest stage of the language and in the contemporary account we presented in Chapter 4, under the form of stem-final stress. Clearly, here the definition of stem differs from the earliest stages of the language, and even from that at the immediately preceding attested stage (cf. §5.3.3). It remains to be seen whether the stem form we find in Lenz is compatible with our own account of PDM.

Summing up, Lenz finds stress is assigned to a penultimate mora both in nouns and verbs. Adjectives, adverbs and function words tend to be stress-final. Disyllabic nouns ending in a vowel may be stressed finally. In verbs we often find an additional stress mark on the root-final vowel.

(5.23) Summary for stress position in Lenz's work

- Nouns:
  - Penultimate mora stress.
  - Some final vowels stressed in disyllables – mostly utterance-finally and before *mew*.
- Verbs:
  - Word level: Penultimate mora stress.
  - Root level (simplex stem): syllable-final stress.

5.4.2.2 Stress assignment in Augusta's *Gramática Araucana* and other works

Although there is no explicit reformulation of the rules for stress assignment throughout the work of Augusta, there are some further precisions made after the 1903 grammar, specifically in the examples and the somewhat less stringent rules of 1910's *Lecturas*. We follow this progression in chronological order.

[46] It is impossible to ascertain whether this is an instance of true Mapuche poetic form or one of Lenz's own imposition upon the hurriedly gathered data.

Gramática Araucana, **1903:** As in those of Valdivia and Febrés, Augusta's grammar provides us with a rule-based system for assigning stress in Mapudungun. A 'General Rule' is followed by a series of exceptions, which we shall see are only partially, or superficially, contrary to the rule.

(5.24) General Rule for Mapudungun stress assignment (Augusta 1903: 2-3):

Stress the last syllable when it is closed or has a diphthong (i.e. a vowel plus a glide) and the penultimate elsewhere.

(5.25) Exceptions to the General Rule (Augusta 1903: 3-4) – Parsing and glossing of examples added:

i. Disyllables that have a schwa in the first syllable are stressed on the last syllable regardless of the general rule (i.e. even when the final syllable is open). Examples are: *pəlí* 'soul', *pəʌ́ɨ́* 'fly$_{N}$'.

ii. Disyllables that have a schwa in the final syllable have two stresses (a spondee). Examples: *fótə́m* 'son'; *mámə́ʌ* 'wood'.

iii. Verbs are stressed according to the general rule in the first person singular of all tenses and moods, and the other conjugations follow this form's stress: *akú-n* 'arrive-IND-1S'; *akú-i-m-i* 'arrive-IND 2-S'; *akú-i-ɲ* 'arrive-IND.1-P'; *aku-lá-n* 'arrive-NEG-IND.1S'; *aku-lá-i-ɲ* 'arrive-NEG-IND.1-P'. Only in the conditional (the subjunctive, in all other grammars) form do we find final stress on the first person plural: *aku-l-í-ɲ* 'arrive-SUBJ-1-P'.

iv. Some verbs which appear to end in two consonants in the indicative first person singular (i.e. *kɨpa-l-n* 'carry-CAUSE-IND.1S', *el-n* 'put-IND.1S', *wəl-n* 'give-IND.1S', *fenʦ̱en-n* 'be.many-IND.1S' *kuʦ̱an-n* 'sicken-IND.1S') actually have a schwa before the final consonant, which may bear stress in the first singular (*el-ə́n* 'put-IND.1.S'). This is the case if the root is monosyllabic (i.e.

el-, 'put'; *wəl-* 'give'). Otherwise, in polysyllabic roots, stress is assigned to the preceding vowel for the first and third person singular of the indicative (*kuʈʂán-ən* 'sicken-IND.1S'; *kuʈʂán-i* 'sicken-IND.3.S'), and according to the general rule elsewhere in the paradigm (cf. *kuʈʂan-í-m-i* 'sicken-IND-2-S', *kuʈʂán-l-e* 'sicken-SUBJ-3S', *kuʈʂan-l-í-ɲ* 'sicken-SUBJ-1-P').

v. Verbs made up of more than one verb have two stresses, the main one being on the first verb (usually the last syllable) and the secondary one on the syllable where it is expected according to the special rules for verb stressing: i.e. *ʈʂaná-naɯɻ-í* 'hit-descend-IND.3', *wɨʈʂún-tɨkú-j=ɲn* 'spill-put-IND-3=P', *ɲɨmá-ɲɨma-ɲé-j* 'cry-REDUP-PASS-IND.3', *θewmá-θewmá-j* 'build-REDUP-IND.3'.

vi. Verbs with 'interposed particles' also have two stresses, the primary one being on the verbal root and the secondary, where the given rules require it: i.e. *jé-pá-i* 'carry-CIS-IND.3', *jé-pa-lá-i-m-i.* 'carry-CIS-NEG-IND-2-S'.

vii. Nouns composed of two nouns have their stress where it would be expected for the first noun, although it often moves to the final syllable of this noun, i.e. *foθú-tʃaʌ́wa* 'spine-fish (fishbone)', *kaʌ́é-kaʌ́e* 'a certain plant of white flowers'.[47]

Augusta's General Rule is, of course, explicitly consistent with Lenz and with Febrés. Nevertheless, the devil is in the details, or in this case, in the exceptions to the General Rule.

Nouns: The stress pattern appears clear with the exception of forms with an inter-consonantal schwa. As we have seen elsewhere, schwa – in apparently free alternation with [ɨ] – surfaces to break up onset or coda clusters, as an epenthetic vowel. In order to explain the final stressed syllable forms with [ə] in the first syllable, as well as the cases

[47]The meaning of kaʌ́é is unclear as a single lexical item.

of 'spondee' stresses, it is reasonable to assume that at this stage in the history of the language, right-edge stress is applied twice to the noun. We assume this occurs once before epenthesis, and once after. Since in the forms in (5.25i) the final syllable would be stressed in the first cycle, refooting is blocked for applying stress to a penultimate syllable. In the case of the forms in (5.25ii), stress can apply anew, to a final closed syllable.

Table 5.20: Stress and epenthesis in nouns

	Underlying	Stress	Epenthesis	Stress	Surface	Gloss
a.	*/pli/*	*plí*	*pəlí*	–	[*pəlí̵*]	'soul'
b.	*/fotm/*	*fótm*	*fótəm*	*fótə́m*	[*fótə́m*]	'son'

Verbs: To explain the exceptions to the general rule that relate to verbal paradigms (5.25iii), it appears to be excessive to rely on a purely morphological rule (i.e. all forms follow the stress of the first person singular). Syllabifying an underlying high-front vocoid (that marks the indicative, the first person or the singular) as a glide in post-vocalic contexts allows all verbs to follow the General Rule without recourse to another form in the paradigm: cf. *akú-j-m-i* 'arrive-IND-2-S'; *akú-j-ɲ* 'arrive-IND.1-P'; *aku-lá-j-ɲ* 'arrive-NEG-IND.1-P'. Although Augusta does not transcribe differences between vowels and glides (these are always ⟨i⟩), in these cases we assume that the first of the syllabically underspecified high front segments is syllabified as a glide, while a second high-front sonorant (⟨I⟩) is lost after glide formation takes place.

(5.26) Syllabification of syllabically underspecified front-high segments (⟨I⟩) in Augusta (1903):

1. $\begin{bmatrix} +\text{high} \\ +\text{front} \\ ?\ \text{syll} \end{bmatrix} \longrightarrow \begin{bmatrix} -\text{syll} \end{bmatrix} / \begin{bmatrix} +\text{syll} \end{bmatrix} \underline{\quad}$; Elsewhere $\longrightarrow \begin{bmatrix} +\text{syll} \end{bmatrix}$

$$2.\ \begin{bmatrix} +\text{high} \\ +\text{front} \\ ?\ \text{syll} \end{bmatrix} \longrightarrow \emptyset\ /\ \begin{bmatrix} +\text{high} \\ +\text{front} \\ -\text{syll} \end{bmatrix} \_\_\_$$

Table 5.21: Example syllabification and stess for verbs with syllabically underspecified segments

Underlying	SYLLAB 1	SYLLAB 2	STRESS; /n/PALATALISATION	Surface
aku-I-m-I 'arrive-IND-2-S'	a.kuj.mi	—	a.(kúj).mi	[akújmi]
akú-I-I-n 'arrive-IND-1-P'	a.kujIn	a.kujn	a.(kújɲ)	[akújɲ]
aku-lá-I-I-n 'arrive-NEG-IND-1-P'	a.ku.lajIn	a.ku.lajn	a.ku.(lájɲ)	[akulájɲ]

Apparent exceptions to the Verbal Rule (5.25iii), i.e. subjunctive first person plurals (cf. /aku-l-I-n/ > *aku-l-í-ɲ* 'arrive-SUBJ-1-P'), are actually stress-final, as expected according to the General Rule, since it undergoes neither of the rules in 5.26. This is also the case for the first person dual, which, although not mentioned in the section on stress, is marked in the relevant section of the grammar with penultimate stress, i.e. *aku-l-íj-u* 'arrive-SUBJ-1-D'. Here, we must assume that there is only one underlying high-front segment, and the glide is inserted to break up the sequence of two high vowels, a process that is common throughout the history of the language for contiguous homorganic vowels (cf. §4.3.5.1 and p. 124).

In the case of the indicative first singular, stress is marked on the last vowel preceding mood marking (i.e. *elú-l-i* 'give-SUBJ-1S), even when we might conjecture that the underlying form of the suffixes is /-l-I-I/, which might surface as [-líj], taking main stress. Unfortunately, we lack enough evidence in the transcripts to make this claim, and must assume that the form *-li* '-IND-1S is grammaticalised in contrast with *-le* '-IND-3S', lacking the same transparent underlying internal structure as that which is proposed for the indicative forms.

Table 5.22: Verbal roots ending in vowels (Augusta 1903). Example: *elu-n* 'give'

	1st	2nd	3rd
Indicative			
Singular	*elú-n*	*elú-jmi*	*elú-j*
Dual	*elú-ju*	*elú-jmu*	*elú-j=ŋu*
Plural	*elú-jɲ*	*elú-jmɨn*	*elú-j=ŋɨn*
Subjunctive			
Singular	*elú-li*	*elú-lmi*	*elú-le*
Dual	*elu-líju*	*elú-lmu*	*elú-l=ŋu*
Plural	*elu-líɲ*	*elú-lmɨn*	*elú-l=ŋɨn*
Imperative			
Singular	*elú-tʃi*	*elú-ŋe*	*elú-pe*
Dual	*elú-ju*	*elú-mu*	*elú-pe=ŋu*
Plural	*elú-jɲ*	*elú-mɨn*	*elú-pe=ŋɨn*

Moving on to roots ending in a consonant (such as those in 5.25iv), for most forms stress appears to be assigned, again, according to the General Rule. The major apparent exceptions are the first and third person singular of the indicative. The first of these, marked with the portmanteau suffix *-n*, is preceded by an epenthetic vowel, which Augusta claims is stressed after monosyllabic roots, but not after longer ones. This state of affairs is rather puzzling.

If we consider that the root-final syllable tends to attract stress, but that monosyllabic roots are not stressed, then it is reasonable to think that the only possible stress for the monosyllabic root is that which is assigned at the word-level. If we then follow the claims that are made in (5.25v) and (5.25vi), that is, that the first element (the root) of a longer verb takes main stress, we may claim that, while in both cases – monosyllabic and disyllabic roots – the epenthetic vowel is stressed, root-stress wins out in the case of the disyllables, while the monosyllable has only the stress on the epenthetic vowel. In a layered morphological system, we assume that the epenthetic vowel is added at the level before word-stress is applied.

Table 5.23: Stress and epenthesis in indicative first singular consonant-final roots

	Root	Stress	Inflect./Epenth.	Stress	Surface	Gloss
a.	/*el-*/	—	*elɨn*	*elɨ́n*	[*elɨ́n*]	'put-IND.3S'
b.	/*kɨʦan-*/	*kɨʦán-*	*kɨʦánɨn*	*kɨʦánɨ̀n*	[*kɨʦánɨn*]	'sicken-IND.1S'

Nevertheless, it is possible that we are dealing with an inaccurate percept on the part of the Bavarian missionary. Although nowhere in the texts is stress marked on these epenthetic vowels,[48] we do find cases where Augusta does not transcribe the epenthetic vowel itself after a monosyllabic root (cf. *kim-n* 'know-IND.1S' p. 204). Furthermore, in Lenz's work, although we do find cases of stressed epenthetic vowels after monosyllabic roots, such as, precisely, *kim-ɨ́n* 'know-IND.1S' (1895-1897: 38), there are also disyllabic roots that follow this pattern, such as *jawel-ɨ́n* 'ride-IND.1S' (*op. cit.* 104).

The picture for the epenthetic vowel in verbs seems murky at best. As in nouns, it appears we are dealing with a process that is no longer fully post-lexical, since the epenthetic vowel is sometimes susceptible to stress marking. The interaction with the stem level stress is crucial to the realisation of stress in such cases. We will return to the issue, however, in our general analysis of the period.

For the indicative 3rd singular marking, there is a question as to its actual segmental realisation and, consequently, the expected position of stress in Augusta's system. Elsewhere (§3.4.1.1) we have claimed that, although this form of the verb only surfaces as either [j] or [i], it must underlyingly include the marker of the indicative and the singular, both high front sonorants (/I-∅-I/ 'IND-3-S'). This, of course, explains why, following a consonant, an [i] may be stressed, as it is likely syllabified as /-ij/ at some point in the derivation, whether or not the final glide is preserved into the surface.

[48] The marking of stress on schwa and ⟨ù⟩ ([ɨ] in Augusta's texts) presented important difficulties for early 20th century typsetting, as Augusta complains in his introduction to the *Lecturas* (1910: XI).

The explicit claim in Exception (vi), however, is that the inflectional marker is left unstressed, in favour of the preceding vowel. The only other stress-marked example of a consonant directly preceding mood marking in the *Gramática* is given in (5.25 v): *ʈsaná-nauɥ-í* 'hit-descend-IND.3'. This contradictory evidence, coupled with the fact that *kuʈsán-i* in (5.25iv) is highly suspect, as it represents a denominal verb (cf. *kuʈsán* 'disease'), leads us to believe that Augusta has a tendency to overapply the General Rule in a surface-true manner, rather than follow the actual pattern in the surface data. This claim is confirmed by a number of forms explicitly marked in the *Lecturas* which stress -IND.3S marker after consonants.

Overall, we may summarise the consonant-final root paradigms as follows, as regards stress: The issue of the second stress on compounds and verbs is interesting (cf. 5.25

Table 5.24: Verbal roots ending in consonants (Augusta 1903). Example: *kon-ɨ-n* 'enter'

INDICATIVE	1st	2nd	3rd
Singular	*kon-ɨ́-n**	*kon-ími*	*kon-í(j)*
Dual	*kon-íju*	*kon-ímu*	*kon-í=ŋu*
Plural	*kon-íñ*	*kon-ímɨn*	*kon-í=ŋɨn*
SUBJUNCTIVE			
Singular	*kón-li*	*kón-ɨ-lmi*	*kón-le*
Dual	*kon-líju*	*kón-ɨ-lmu*	*kón-ɨl=ŋu*
Plural	*kon-líñ*	*kón-ɨ-lmɨn*	*kón-ɨl=ŋɨn*
IMPERATIVE			
Singular	*kón-tʃi*	*kón-ŋe*	*kón-pe*
Dual	*kón-ju*	*kón-mu*	*kón-pe=ŋu*
Plural	*kon-íɲ*	*kón-pe*	*kón-pe=ŋɨn*

* but also: *kuʈsán-ɨn 'disease*-IND.1S*'*

v-vii). As in contemporary accounts, this stress is realised on the final syllable of the first element (nominal stems and verbal roots, all of which we refer to here as 'stems'). We are told that main stress gravitates towards this leftmost stress in both nouns and verbs. However, stem-stress in verbs only surfaces in verbs with more than one root (i.e. verbs with nominal incorporation or SVCs) or suffixed beyond the OFI

(i.e. mood, focal person and number). The implication, of course, is that minimally inflected forms do not have an independent stress on the stem. In most vowel-final stems this is irrelevant, since stem and word stresses are predicted to be conflated, but in particular in the consonant-final ones, there is room for both stresses. Unfortunately, Augusta gives no exemplification of these cases. We follow exceptions (iii) and (vi) to Augusta's stress rule (5.25) in assuming that these forms do not take stress.

Table 5.25: Stress in minimally inflected verbs (vowel and consonant-final), further suffixed verbs, and serial verb constructions (SVCs)

	ROOT+OFI		ROOT+OFI		ROOT+SFX+OFI		ROOT+ROOT+OFI
a.	*elú-j-m-i* 'give-IND-2-S'	b.	*kon-í-m-i* 'enter-IND-2-S'	c.	*jé-pa-là-j-m-i* 'carry-CIS-NEG-IND-2-S'	d.	ʈʂaná-naɰ-í-j 'strike-down-ind-3s'

Lecturas Araucanas **1910:** Although Augusta refers the reader back to his grammar when laying out his account of stress in the *Lecturas* (*Introduction*, p.XI), his actual claims here are boiled down to the bare essentials. The General Rule (cf. 5.24) is re-stated alongside the claim that Mapudungun stress has a certain inherent tendency for variation, as well as some dialectal differences (which are not specified). With regards to verbs, Augusta does not delve into the details we find in the *Gramática*, but he does state that 'compound verbs' (i.e. SVC and verbs with incorporated nouns) have two stresses, a primary one on the first root and a secondary one on the 'ending'.

As regards the actual transcription of texts, Augusta attempts to mark stress only where it is not predictable by the general rule, however, he admits he has not been consistent in this practice. Furthermore, he tells us that 'aside from the prosodic stresses, we also find declamatory or emphatic stresses which allow a certain syllable to be reinforced outside the rules of stress assignment' (p. XI). No specific conditions for this reinforcement are given, nevertheless.

In the texts, the forms that are most often stressed (i.e. do not appear to correspond

to the General Rule, at least on the surface) are adjectives (cf. *weθá* 'bad', *ɟitá* 'old') and verbs marked for the indicative third singular, following a consonant (cf. 5.27). Since the stress marking on this inflectional ending is extremely consistent in Augusta's texts, we assume that the underlying structure or the inflection provides the appropriate context for the application of the General Rule, rather than assuming an exception to the rule and an equivalence of the surface and underlying forms (i.e. /-I-∅-I/ '-IND-3-S' > [íj]| C__) rather than /-I/ '-IND.3.S' > [-í]| C __)

(5.27) Stress in indicative third person singular marked verbs following a consonant (Augusta 1910):

a. *afel-uw-í(-∅-j)* (p.142)
bore-REFLEX-IND-3-S
'he gets bored'

b. *puw-í(-∅-j)* (p.152)
'arrive-IND-3-S
'he arrives'

c. *aju-fí(-∅-j)* (p.62)
love-3SP-IND-3S
'he loves'

Beyond the right edge of the verb, the other major mark that we find in the texts is the final syllable of verbal roots or first elements of nominal compounds. In the case of verbs, this occurs where there is a serial construction, or where there is a longer succession of suffixal material intervening between the final syllable and the obligatory finite inflection.

(5.28) Stress on roots and stems of longer words (Augusta 1910):

a. *kuʃé-pəʎi* (p.83)
old.lady-soul
'old lady's soul'

b. *wəɲó-kin-tu-j* (p.83)
return-know-IND.3S
'he looks back'

c. *tʃɨŋár-ŋe-j* (p.190)
stab-PASS-IND.3S
'he was stabbed'

d. *kɨpá-rke-j* (p.XI)
come-REP-IND.3S
'he is said to come'

We note that, although only the first element's stress is marked in the transcription, a second stress is expected according to the General Rule. It is Augusta's claim that both in the nominal compounds and in longer verbs, the main stress is usually the one

corresponding to the first element. However, where the verb takes only the OFI, only word-level stress is evident. No particular claim is made regarding the stressability of adjacent syllables.

Nowhere in the transcriptions – and in contrast to Lenz's contemporary texts – do we find stress marked on the final open syllable of a noun in isolation. This is, at the very least, curious, if not outright suspicious. The key to understanding such different data is in Augusta's own admission in referring to the fine-grained detail of the dialectal differences in the texts:

> We are sorry that our ear lacks the adequate sensitivity in order to distinguish all the phonetic differences of the dialects, as Dr. Lenz has done in his *Estudios Araucanos*, and we confess that not even the grammatical differences are all given in our notes, as we had to make them quickly. The same is true with regards to the work of the Rev. Father Sigfriedo, who always followed our grammar. (Augusta 1910: *Introduction* XI)

In other words, the texts that Augusta gives us are not meant even as the broadest phonetic transcripts, but represent notes that relatively fluent second language speakers made of the spoken texts of first language speakers. Attention to stress position in the actual instantiation of the texts was probably quite rare, while the general rules and intuitions of the second language learners were likely to have been applied at a later stage. As a matter of fact, the actual transcripts never diverge from the rules given in the grammar and the introduction to the *Lecturas*, except in the case of the adjectives and the indicative third person forms. This, of course, seems symptomatic not of the abstraction of the rules from the texts, but of the application of the rules to the texts, these having been abstracted from the previous exposure of the missionaries to the language.

Overall: Summing up, Augusta's account of stress appears to foot a moraic trochee at the right edge of all word categories, except perhaps adjectives. No evidence is given for stress alternation in nouns except the general fact that there is such a thing as 'declamatory or emphatic' stress. It seems clear that what Augusta has consigned is the purely lexical system of stress, so no post-lexical or pragmatic/contextual details are coded in his transcriptions. In this sense, the data in his grammar, texts and dictionary are not sufficient for accounting for these broader processes.

At the level of word-internal stress, however, Augusta gives an abundance of detail and exemplification. In particular, we are left with the clear percept that in longer forms – such as nominal compounds and multi-suffix verbs – a second stress surfaces on the last syllable of the first element (the first stem in the compounds and the root in verbs). We are told, furthermore, that these first elements attract main stress in contrast with the right-edge word-level stress (the penultimate mora) which bears secondary stress. Where the verb is minimally inflected, it is the word-edge that takes primary stress, while the root remains unstressed.

(5.29) Summary of Mapudungun stress assignment based on Augusta (1903, 1910)

- Nouns:
  - Penultimate mora stress.
- Verbs:
  - Word-level: Penultimate mora stress.
  - Root-level (simplex stem): syllable-final stress.
  - Interaction:
    - In longer words, the root-level takes main stress.
    - In minimally inflected verbs, only the word-level takes stress.

5.4.3 Formal account: Late nineteenth / early twentieth century Mapudungun stress assignment

The combination of Lenz's attention to fine-grained phonetic detail and Augusta's strong intuitions as a relatively proficient second-language speaker give us a fairly good picture of stress assignment at the turn of the twentieth century.

The account the two Germans leave us with is not too dissimilar from what we find in our own account of contemporary Mapudungun stress: There are two major stress positions, one on the penultimate mora of the word, and in longer words, on the final syllable of the leftmost element. There is also some visible alternation in the case of vowel-final disyllables (especially, in Lenz's *Estudios*, for the case of nouns).

5.4.3.1 Nominal stress

Stress in monomorphemes seems relatively straightforward, falling on the penultimate mora of both di- and trisyllables. Both Lenz and Augusta give us some interesting – though sparse – data regarding the interaction of stress and epenthesis in disyllables. We have argued that in Augusta's account a right-aligned moraic trochee is footed at the right edge of the word, both before and after epenthesis, though not overriding previous stress-marking. Hence, a word with a schwa in the first syllable has only one stress – on the second syllable – while a word with a schwa in the second syllable has two stresses (cf. Table 5.20).

Lenz, however, gives a slightly different insight regarding the presumed epenthetic vowels. He tells us explicitly in 1893 that final syllable, interconsonantal schwa is unstressed, yet goes on to mark precisely this vowel as stressed in a number of the texts in his *Estudios* (cf. Table 5.17). In the light of our own contemporary data, where final closed syllable [i̱] receives stress, it seems that Lenz and Augusta's data

represent an intermediate stage between a purely post-lexical process of epenthesis, and having this vowel as part of the noun's underlying representation.

The fact that Augusta claims that disyllabic nouns with final syllable intervocalic schwa have two stresses (a 'spondee' in his terms) seems to represent the clearest form of an intermediate stage. Here we must assume that there is a special rule for epenthesis that occurs between two applications of the same stress rule. On the other hand, Lenz's early claim – based perhaps on his reading of Febrés, or on data from a specific dialect – seems to show a stage in the language where epenthesis is purely post-lexical. In his later studies, the Picunche and and Pehuenche transcripts appear to show a stage where the epenthetic vowel has become part of the lexical entry.

Although somewhat tentatively, we make the claim here that the difference between the level at which 'epenthesis' occurs in Lenz and Augusta is a dialectal one, synchronically, though ultimately it is likely to represent a wider process of change in the lexicalisation of the vowel at the diachronic level.

Table 5.26: Dialectal (and historical) differences in the position of stress in disyllabic nouns with final syllable interconsonantal [ə]∼[ɨ] (Example: *n̪amɨn̪* 'foot')

	Febrés (1765) (Picunche/Moluche) Dialects II and V	Augusta (1903) Lafkenche (Moluche) Dialects III and V-VII	Lenz (1897) Picunche/Pehuenche Dialects II and IV
Underlying	*n̪amn̪*	*n̪amn̪*	*n̪amɨn̪*
Cycle 1: Stress	*n̪ámn̪*	*n̪ámn̪*	*n̪amɨ́n̪*
Epenth	—	*n̪ámɨn̪*	—
Cycle 2: Stress	—	*n̪ámɨ́n̪*	—
Post-Lex: Epenth	*n̪ámɨn̪*	—	—

The implication here, of course, is that at least as regards [ə]∼[ɨ] stress assignment, the central dialect is more conservative than the northern and eastern varieties. We will discuss this issue again within the broader discussion of change across the language's

history (cf. §5.5.5).

In the case of the disyllables, there is some alternation for vowel-final forms, which seems, at this historical stage, to be restricted to phrase-final position or to the position preceding the postposition *mo/mew* (see §1.2.2 for its functions).[49] In that it is only a tendency, rather than a categorical shift of stress position, and that it refers to phrasal edges and the concatenation of specific words or functional elements, final open syllable stress bears the hallmarks of a phrasal rule.

For nominal compounds, we only have data from Augusta, which is explicit in claiming that the final syllable of the first stem tends to take primary stress, while the second stem is stressed according to the general rules of stress assignment (cf. 5.25vii; 5.28). This pattern is compatible with our own PDM data (cf. 3.3.5), although in most cases we find main stress on the second element, which is the default head in nominal compounds (cf. Baker & Fasola 2009)).

5.4.3.2 Verbal stress

Verbs also follow the right-aligned moraic trochee pattern, overall. Where labelling exists in Lenz's *Estudios* and Augusa's *Lecturas*, there appear to be no true exceptions to the rule. There are, however, some less transparent patterns, such as the third person singular of the indicative after consonants, which is marked with a single, stressed ⟨i⟩ in both transcriptions. In such cases we assume that marking is actually /-i-∅-j/ 'ind-3-s' at some point in the derivation, before stress assignment (cf. Table 5.18, Table 5.21, 5.27).

We find there is also an additional complication for stress on verbs in indicative

[49]We note here that Augusta also mentions the tendency for nouns followed by *mew* to be stress-final (Augusta 1903: 4). It is possible that the variation in the position of stress in the preceding word is related to the function of the postposition in each case and the nature of the bond between it and the noun (some being more suffix-like than others), however, our data is too uncertain in order to establish this.

first singular, when preceded by a consonant. In such cases there is an epenthetic vowel ([ə]∼[ɨ]) which surfaces between the *-n* 'IND.1S' marker and the preceding consonant. Although, based on his earliest general rule of stress (1893, 202; 5.21), Lenz would not predict stress to fall on an interconsonantal syllable-final reduced vowel in any word category, his texts (1895-1897) show a number of cases that are marked for stress in precisely such vowels (i.e. kim-ɨ́n 'know-IND.1S, 38 and *jawel-ɨ́n* 'ride-IND.1S' p.104).

Augusta claims that, where before the epenthetic vowel there is a single syllable, the said epenthetic vowel is stressed, but where there are more syllables preceding, stress falls on the last non-epenthetic vowel. Exemplification of this rule is very difficult to come by in the actual texts (1910), but we do find that he fails to transcribe the epenthetic vowel after some monosyllabic roots (cf. *kim-n* 'know-IND.1S.', which of course argues against its being stressed).

The picture we can piece together for stress in verbal epenthesis, although once again, tentative, seems to be similar to that of the same process in nouns, where epenthesis seems to have percolated somewhat unevenly into the lexical level of word building (cf. Table 5.26). We note, however, that this possibility of applying epenthesis before stress assignment cannot be extended to other forms of epenthesis in the verb. The epenthetic vowel surfacing in the second person plural forms (cf. *elu-j-m-ɨn* 'give-IND-2-P), for instance, is never stressed, though it occupies the relevant position at the surface level.[50]

The fact that stress on the epenthetic vowel is possible at all in the first person singular is probably related to its being a portmanteau morpheme, and hence breaking away from the predominantly agglutinating and clearly decomposible inflectional system of the language. As a result, the underlying form of the indicative first singular may be easily conjectured by the language learner to be either *-n* or *-ɨn*, the former

[50]The same, of course, is true for the epenthetic vowels in the second and third person of the subjunctive, after a consonant (cf. 5.24)

acquiring an epenthetic vowel when following a consonant, and the latter losing its vocalic element after a nucleus.

We assume, then, that the pattern for epenthesis in the first singular of the indicative is, diachronically, very similar to that of nominal epenthesis. In the data from Lenz, the [ə]∼[ɨ] vowel seems to be a part of the underlying representation of the suffix, while in Augusta, there seem to be two different stages in coexistence, one that has post-lexical, gradiently applied epenthesis (cf. *kím-n/ kɨpá-l-ɨn*), and one which has an underlying central vowel as part of the indicative first singular suffix (cf. *el-ɨ́n*). In the case of Augusta, we propose that the distinction between these two patterns has to do with root-specific selection of suffixal allomorphs.

Of course, both Lenz and Augusta's data contrast with the previous stage represented by Havestadt (1777; cf. Rule 5.13vii) and Febrés (1765; cf. Rule 5.15iv), where the epenthetic vowel is never stressed.[51]

Table 5.27: Dialectal (and historical) differences in the position of stress in conosnant-final roots with a [ə]∼[ɨ] vowel preceeding [-n] '-IND.1S' marking (Examples: *kim-ɨn* 'know-IND.1S'; *el-ɨn* 'place-IND.1S')

	Havestadt & Febrés (18th Century)		Augusta (1903) Lafkenche (Moluche) Dialect V (mostly)		Lenz (1897) Picunche/Huilliche Dialects II and VIII	
Word-Level Inflection's UR	*kim-n*	*el-n*	*kim-n*	*el-ɨn*	*kim-ɨn*	*el-ɨn*
Word: STRESS	*kím-n*	*él-n*	*kím-n*	*el-ɨ́n*	*kim-ɨ́n*	*el-ɨ́n*
Post-Lex: EPENTH	*kímɨn*	*élɨn*	*kímɨn*	*elɨ́n*	*kimɨ́n*	*elɨ́n*

Note here that the synchronic dialectal distribution is less transparent, as we find fewer samples of stress for the post-consonantal '-IND.1S' than we do for verbs ending in two consonants with an intervening [ə]∼[ɨ]. As a result, the Picunche and Huilliche

[51]Note that in Table 5.27, only the relevant part of the derivation is given, i.e. that where the inflectional material is added and word-level stress applied. The issues surrounding stem stress and its interaction with word-stress are discussed below.

texts in Lenz's data show the same pattern of stress on the former epenthetic, which of course seems rather odd, considering they are the most distinct forms as regards both linguistic and geographical features. This said, both dialects were more heavily exposed to Spanish during the 17th, 18th and 19th centuries than those of the central Mapudungun area.

Another key aspect of the verbal stress system, as presented explicitly by Augusta and exemplified often by Lenz, regards the interaction of stem and word-level stress. It appears that where the final syllable of the verbal root and mood-marking are not adjacent (i.e. where there are suffixes beyond the 'obligatory finite inflection'), there are two stresses, one on the final syllable of the root, and the other on the penultimate mora of the word (cf. Table 5.19; 5.25v, vi; 5.28).

As we have mentioned, it is Augusta's claim that the first element in such constructions – the root, or underived stem – bears main stress, while the rightmost stress is secondary. A quick look at the transcription of stress in Lenz's texts shows this to be somewhat unstable. The majority of verbal forms that are marked in the *Estudios* have only the rightmost, penultimate mora stress transcribed, while stem-final stress is only occasionally marked, especially when there is intervening suffixal material.

In other words, the data from Augusta – which claims stem-final main stress – and from Lenz – which transcribes mostly word-edge stress – seem to show that, although the two stresses are important to the system, their relative prominence is less relevant. As in the contemporary account, we find here that the culminativity of stress does not seem to be enforced particularly strongly in words with complex morphological structure. What does seem important, however, is to mark the edge of the leftmost constituent, which emphasises demarcation over rhythm and culminativity. The existence of morphological-boundary related contours in the stress patterns appears to be more important than the relative height of the peaks.

5.4.3.3 Other word categories

Although neither Lenz nor Augusta mention stress in other word categories explicitly, in both authors' collections of texts (especially Lenz's), stress is often marked on the final open syllable of disyllabic adjectives, adverbs, pronouns and demonstratives. We assume, then, that this is the normal position of stress in such words, which are never stressed initially.

Of course, accounting for this pattern requires some adjustment to the general stress assignment system which foots a single moraic trochee at the right edge of the word. Interestingly, this pattern appears to be far more similar to that of the first stem-element in compounds and verbs. Since we have remained agnostic as to exactly what mechanism brings about stem-final stress, we do the same for these peripheral word categories. We do claim, however, that they must be stressed at the same level as the stems. In a way, the fact that these are all dependent word categories – they do not tend to stand alone, but modify or complement verbs or nouns – may allow us to say that they are not stressed as full prosodic words.

5.4.3.4 Overall stress assignment (turn of the twentieth century)

In order to account for the data, again we will propose a series of rules applied to different strata of the word-building process. With regards to the footing of the first element of compounds and verbs with two stresses, we remain agnostic. It is possible that the same kind of interaction is at play here – as we have proposed for PDM (§4.2.3) – between initial extrametricality and right-aligned moraic trochees, however, our data is insufficient to make such claims. Therefore, we simply maintain there is a stage in the word-building process where the root- or stem-final vowel is stressed (here we refer

to both as stems).[52]

Although Augusta claims that the leftmost stress obtains maximal prominence, we have seen that this is by no means borne out in all cases in his own and Lenz's transcriptions. As a result we stipulate that there is a stem-promotion (STEM) rule at the post-lexical level, but which has a certain degree of optionality due to the level of its application. The fact, however, that we never find stressed syllables to be adjacent across the root/OFI inflection boundary (see 5.28), and that in such cases it is always the right, word-level stress that wins out, requires a rule that targets stress specifically in the context of word building. We claim then that there is a rule that bans clash at this boundary, de-stressing the root. Note that this only affects the cases where word-level stress falls on the obligatory inflection of finite verbs (cf. Table 5.28b).

Table 5.28: NO-CLASH between root and obligatory inflection (underlined)

	UR	STEM STRESS	WORD SYLLAB	WORD STRESS	WORD NO-CLASH	POST-LEX STEM
a.	*je.-pa-<u>I-∅-I</u>* 'CARRY-IND-3-S'	*(jé-)*	jé.paj	*jé.(páj)*	—	*jépàj*
b.	*kon-<u>I-∅-I</u>* 'enter-IND-3-S'	*(kón-)*	*kó.nij*	*kó.(nój)*	*ko.nój*	—

As regards epenthesis, both in nouns and in verbs, it seems clear that Lenz and Augusta's data represent different dialects or diachronic stages, so a single set of rules and domains for their application could not account for both. Here we choose to represent a somewhat idealised stage or dialect – roughly corresponding to Augusta's data – where nominal and indicative first person epenthesis are no longer purely post-lexical, but at the same time cannot be claimed to be part of the underlying representation

[52]If we recall, in the contemporary account, the domain for stem stress is recursive for verbs (§4.3.2). Here, we have only claimed that stress falls on the final syllable of roots. It is possible that the same stem-extending suffixes are stressed in the period represented here, but data is insufficient. The fact that Augusta says that the passive suffix *-ŋe* is invariantly stressed is suggestive, as is the stressing of the proximity marker *-pe* in *ɲam-pé-ja-vu-j* 'get.lost-PX-FUT-BI-IND.3' in Lenz (1895-1897: 96), who normally tends to provide final stress only when a single stress is marked.

of the noun or of all forms of the suffix (allomorphy). Nominal epenthesis must occur between applications of stress assignment (cf. Table 5.20 and Table 5.26).

(5.30) Rules accounting for turn of the twentieth century Mapudungun stress:

1. Syllabification (Syllab):
   (a) Parse a domain into syllables from left to right.
   (b) Create nuclei using no more than one vocalic segment. Delete [ɨ]∼[ə] vowels when adjacent to another vowel.
   (c) In series of consonants, prioritise the creation of a mono-segmental onset. Remaining consonantal material may be syllabified in the coda.
   (d) For the case of high sonorants underspecified for syllabicity (in particular /j∼i/ or ⟨I⟩), parse as a nucleus after a consonant and as a glide after a vowel.
   (e) Delete a second high sonorant where it follows a homorganic glide (see 5.26).
2. Footing (Foot): Build moraic trochees aligned to right edge of the word. Where the minimum of two moras is not available, build a single monomoraic foot.
3. Prominence Assignment (Prom): Assign a prominence mark to the final syllable of stems and to the heads of feet.
4. Clash Avoidance (No-Clash): De-stress a root-final syllable when it is immediately adjacent to a stressed obligatory verbal inflection.
5. Epenthesis (Epenth): Break up a series of two consonants (not glides) in the coda of a syllable by inserting a [ɨ] or [ə] between them.
6. Stem-promotion (stem): Add an additional prominence-mark to the leftmost of two stresses within a single prosodic word.

7. Glide insertion (GI): Insert a glide in order to break up a series of vowels of the same height. Match the back/front feature of the glide to to that of the preceding vowel.[53]
8. Glide Deletion (GD): Delete glides in a word-final homorganic vowel-glide sequences.
9. Nasal Palatalisation (NP) Palatalise a word-final nasal when preceded by a high front vowel or glide.
10. Phrase-final stress (Phrasal): Promote the final syllable of a disyllabic noun if phrase-final.

Rules (1) - (4) in 5.30 are lexical, applying at least once at the word level. Of these, (1) and (3) also apply to the stem. Rule (5) applies nouns at the word-level and to verbs at the post-lexical level. Rules (6) to (10) are post-lexical, as they do not affect the position of stress (even though (6) affects the hierarchy of previously assigned stress).

The general word-building and stress assignments system for the stage of the language is given in the diagram below:

As a result of this structure, we propose the following derivations for simplex and complex nouns and verbs:

[53]See a similar rule in Rivano (1990: 138), and the details in §4.3.5.1 and §3.4.1.1 p.124.

Figure 5.1: Lexical Phonology of turn of the twentieth century Mapudungun

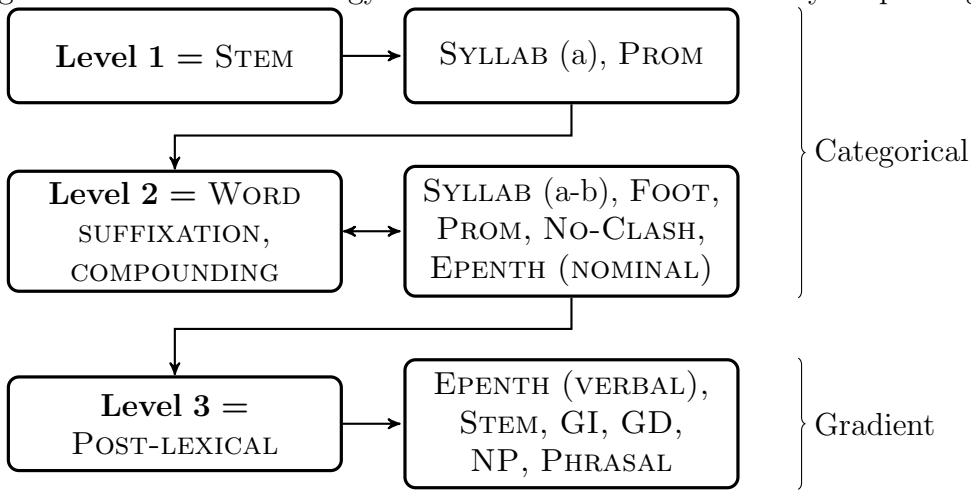


Table 5.29: Verb-stress at the turn of the twentieth century

		(a.)/aku-I-I-n/ 'arrive-IND-1-P'	(b.)/kɨpa-il-n/ 'come-CAUSE -IND.1S'	(c.)/kim-fi-I-∅-I/ 'know-3SP -IND-3-S	(d.)/el-in/ 'place IND.1S'	(e.)/je-la-a-I-∅-I/ 'carry-NEG -FUT-IND-3-S'
Stem	Syllab; Prom	* a.ku-	* kɨ.pa-	* kim-	* el-	* je-
Word	Syllab; Foot; Prom; No-Clash	* a.kujn	* kɨ.paln	* * kim.fij	* el.ɨn	* * je.la.aj
Post-lexical	Epenth$_V$; Stem; GD;GI;NP	* a.kujɲ	* kɨ.pa.lɨn	* * * kim.fi	* el.ɨn	* * * je.la.jaj
Surface		[akújɲ] ~ [akújn]	[kɨpálɨn]~ [kɨpáln]	[kímfi]~[kímfij]~ [kímfí]~[kímfíj]	[elɨ́n]	[jèlajáj]~[jélajáj]~ [jèlaáj]~[jélaáj]

(5.31) Summary of Mapudungun stress at the turn of the century:

- Nouns:
  - Stressed on a right-aligned moraic trochee.
  - Epenthesis: varies by dialect/stage of the language.
    - [ə]~[ɨ] breaks up clusters.
    - Always post-lexical in the penultimate syllable or earlier.
    - In a final syllable it may be post-lexical (Augusta), or part of the UR

Table 5.30: Nominal and adjectival stress at the turn of the twentieth century

		(a.)/mawiθa/ ‘woodland’	(b.)/fotm/ ‘son’	(c.)/pʎi/ ‘fly’	(d.)/foθu-tʃaʎwa/ ‘spine-fish’	(e)/weʃa/ ‘bad’
Stem	Syllab; Prom	—	—	—	* fo.θu	* we.ʃa
Word 1	Syllab; Foot; Prom;	* ma.(wi.θa)	* (fotm)	* (pʎi)	* * fo.θu-(tʃaʎ).wa	—
Word 2	Epenth$_N$ Foot; Prom;	—	* * fo.(tɨm)	* pɨ(ʎi)	—	—
Post-lexical	Stem	—	—	—	* * * fo.θu-tʃaʎ.wa	–
Surface		[mawíθa]	[fótɨ́m]	[pɨʎí]	[foθútʃàʎwa] ∼ [foθútʃáʎwa]	[weʃá]

and stressable (Lenz).

– Exceptions:

◦ Stress on word-final vowels may occur in disyllables at the end of the utterance.

- Verbs:
  - Word-stress:
    - Falls on the penultimate mora of the stem.
    - Apparent exceptions are cases of underlying, syllabically underspecified vocoids following a homorganic glide. We claim these are deleted before stress assignment (cf. 5.26).
    - The (erstwhile) epenthetic vowel in the -IND.3S marker *-n/-ɨn* is regularly stressed in Lenz's texts and occasionally in Augusta's.
  - Stem-stress:
    - Falls on the final syllable of the root, where not adjacent to the OFI.
- Interaction:
  - Only word-level stress is found in minimally inflected verbs (root+OFI).
  - Elsewhere, main stress tends to be on the stem.

5.5 Preservation and change in Mapudungun morphoprosody *1606 – today*

So far, in this chapter, we have examined the data for stress assignment from five early studies of the Mapuche language, spanning almost exactly three hundred years (Valdivia 1606 – Augusta 1903). The presentation of the data, we have seen, is not homogenous, either in its form, in its theoretical outlook, its depth of exemplification, or in its actual description of the language. However, there is no doubt that all the works deal with closely related varieties of a single language, and that it should be possible to trace a diachronic path from one stage to another, as we have already advanced for a number of specific issues.

To the three historical cross-sections of the language presented in this chapter, we may add that of contemporary data, for which we shall of course focus on our own original stress data (Chapters 3 and 4), relying on other contemporary work for broader issues in the phonology and morphology of the language (see Chapters 1 and 2). The result is a collection of four stages of the language spanning just over 400 years of its development.

Table 5.31: Documented synchronic stages of the language

Stage	Period	Sources
Stage I	Early 17th century	Valdivia (1606),
Stage II	Mid 18th century	Havestadt (1777), Febrés (1765)
Stage III	Late 19th/ Early 20th century	Lenz (1893, 1895-1897), Augusta (1903, 1910, 1916)
Stage IV	Early 21st century	This study – data gathered in 2012

As will be clear thus far, the most striking features of prosodic change in the first three centuries of the historical period of the Mapuche language are the system's overall transition from syllabic to moraic trochees (§5.5.1), the redefinition of the domain of the stem (and its effects on stress – §5.5.2), the lexicalisation of epenthesis in specific morphological and prosodic contexts (§5.5.3), and finally the development of final-

syllable stress in some word-categories such as adjectives, adverbials, determiners and pronouns, as well as in some nouns and in the initial elements of complex nouns and verbs (§5.5.4). In what follows, we will examine the stages of each one of these changes, evaluate them with regards to the general situation of the language at the time (§5.5.5), and contrast them with what has actually been preserved despite the changes (§5.5.6). More general conclusions regarding the data for the history of Mapudungun morphology and stress interactions follow (§5.6).

5.5.1 Changes in weight sensitivity

The earliest observation we have for Mapudungun stress (Valdivia 1606: 74) is the one claiming that stress – in all word categories but verbs – falls on the penultimate syllable. Approximately one hundred and fifty years later, this pattern appears to be restricted only to vowel-final nouns, while consonant-final ones have shifted their stress to the final syllable. Explicit claims at later stages in the language find this pattern to persist, although there is a tendency to stress a disyllable's final vowel in certain syntactic positions (Stages II and III) or in particular registers (Stage IV).

Table 5.32: Changes in nominal stress in di- and tri-syllables: vowel and consonant final (feet in parenthesis)

Stage I	Stage II	Stage III	Stage IV	Gloss
(rú.ka)	(rú.ka)	(rú.ka)∼ (ru.ká)	(rú.ka)∼ (ru.ká)	'house'
(pú.kem)	pu.(kém)	pu.(kém)	pu.(kém)	'winter'
ma.(wí.θa)	ma.(wí.θa)	ma.(wí.θa)	ma.(wí.θa)	'woodland'
a.(tʃá.waʌ)	a.tʃa.(wáʌ)	a.tʃa.(wáʌ)	a.tʃa.(wáʌ)	'hen'

We assume that the blanket claim for penultimate stress at Stage I applies not only to nouns but to all other non-verbal word categories. By Stage II, the weight-sensitive pattern seems to apply to these word-categories as well, though we have some initial evidence for stress shifting to the final of two syllables in particular syntactic contexts

and registers (see §5.5.4, below). By the turn of the 20th century and Stage III most disyllables – excepting nouns and verbs – were stress-final, a pattern that continues into PDM (Stage IV). The transition to final vowel stress in adjectives, however, is dealt with in §5.5.4.

Table 5.33: Changes in adjectival stress: vowel and consonant final forms (applicable also to adverbs, pronouns and determiners)

Stage I	Stage II	Stage III	Stage IV	Gloss
(kó.ɲoʎ)	ko.(ɲóʎ)	ko.ɲóʎ	ko.ɲóʎ	'purple'
wé.θa	wé.θa	we.θá	wé.θá	'bad'

As regards verbs, the earliest data seems to show a fundamentally morphologically-driven stress assignment system, which places stress on the final vowel before the 'obligatory finite inflection' (i.e. mood, person and number marking). As we have seen (cf. p.238, Table 5.6), however, in the vast majority of the verbal paradigms this position – the stem-final syllable – is effectively the penultimate syllable. We suggested, therefore, that where the two are not coextensive, there must be a word-level rule promoting the stem stress (always in clash with the penultimate, when not conflated).

Our analysis of Stage II showed verbal stress to follow the same overall pattern of Stage I in terms of stressing the stem-final vowel and the head of a right-aligned trochee, the only differences being that the trochee, as in nouns, was considered to be weight sensitive and to take priority over stem stress. Effectively, this means that the trochee is more clearly surface-true than in the preceding section.

In Stage III, verbs are also stressed on a right-aligned moraic trochee and on the final syllable of the stem. At this point, however, the stem appears to be restricted mostly to the verbal root. Where the two stress rules do not target the same syllable, it is Augusta's contention that the stem takes priority over the root, however, this occurs only where the stem is not immediately adjacent to the OFI (1903: 4). The ultimate

fact is that stress is marked on the penultimate mora at some stage of the derivation.

In our own data for Stage VI we find a very similar pattern to that of Stage III, the only major difference being that the stem is defined as the root followed by a limited number of mostly valency-changing suffixes (cf. §3.4.3.1). In this case, the penultimate mora tends to be promoted in the context of clash with the stem-final syllable, except when the stem is derived, in which case it takes main stress.

Table 5.34: Changes in right-edge verbal stress (feet in parenthesis, OFI uderlined)

Stage I	Stage II	Stage III	Stage IV	Gloss
(kó.n-ij)	kò.(n-íj)	ko.(n-íj)	kò.(n-íj)	'enter-IND.3-S'
kó.(n-ì.mi)	kò.(n-í.mi)	ko.(n-í.mi)	kò.(n-í.mi)	'enter-IND.2-S'
e.lu.-(fí-n)	e.lu.(-fí-n)	elú.(-fi-n)	elù.(-fí-n)	'give-IND.1-S'

If our data is relatively accurate, the change from syllabic to moraic trochees occurs early in the recorded history of the language, between Stages I and II.

(5.32) Major historical changes in weight sensitivity (stem is PrWd – OFI):

- Stage I
  - Non-Verbs:
    - Stress on the penultimate syllable of the word (syllabic trochee).
  - Verbs:
    - Stem-final syllable stress (probably with penultimate syllable stress).
- Stage II
  - All word categories:
    - final closed syllable stress, otherwise, penult-stress (moraic trochee).
  - Verbs:
    - Mostly conflated with stem-final syllable stress (secondary).

Although the sparse nature of the data in the sources of the relevant stages requires some caution, we may speculate with regards to the conditioning factors for the change. Key to our analysis is the idea that, in order for a change to take place, the children acquiring the language must have some evidence that may be interpreted

differently from the previous generation's established system. In this case, the evidence for weight sensitivity of stress position would be represented by the stressing of final closed syllables in Stage I.

Evidence for final closed syllables being stressed would have most obviously come from the verbal system, in particular from the first person indicative and a number of other forms where the OFI is preceded by a vowel (cf. Table 5.35). Interestingly, in the remainder of the forms of the paradigm there is a very strong tendency for the final syllable to be open and for stress to fall on the penultimate. As a result, the percept would have been that the stem-final stress – which was main stress as well – was usually also on the penultimate mora.

Table 5.35: Stage I stem-stress on a final closed syllable and on a penultimate syllable in a vowel-final verb (example: *elu-* 'give')

Final Closed	*elú-n*	'-IND.1S'	*elú-l-m-n*	'-SUBJ-2-P'	*elú-j*	'-IND.3S
Penult Vowel-final	*elú-j-m-i*	'-IND-2-S'	*elú-l-j-u*	'-SUBJ-1-S	*elú-tʃi*	'-IMP.1S'

Another contributing factor is likely to be the phrase-final raising that Febrés (1765: 8, 145) reports for formal illocutions (*coyaghtun*, cf. §5.3.2.2). Insofar as some contexts (i.e. phrase final) showed a tendency to 'lengthen' the second syllable of disyllables, these could have been construed as stress-final. Although this is reported only in the Catalan grammarian's eighteenth century work, we suggest that the stylistic shift is likely to have begun earlier, adding the precept of stress especially to those syllables which were already longer by virtue of having a coda. In this sense, nouns – in particular ones ending in a consonant – would have had some alternation displaying stress on the final syllable. As a result, the language learner may have conjectured that the alternation was based on the weight of the final syllable overall.

5.5.2 Changes in the stem domain

Stages I and II of the language display an almost purely morphological rule for verbal stress (although at Stage II it is conflated with penultimate mora stress at the word level). At Stage I, prominence on the final vowel of the first person singular indicative – invariantly the syllable preceding the OFI (the stem-final syllable) – is claimed to be reproduced throughout the paradigm with only a few exceptions (cf. Valdivia 1606: 75). Stage II presents a very similar patter of stem-final stress, though in competition with penultimate mora stress. By Stage III, however, we find that primary stress is on the root-final syllable (cf. Table 5.36c,d), except in the cases where the root is followed exclusively by an OFI, in which case the word-level right-aligned moraic trochee is stressed (cf. Table 5.36b). Our own Stage IV data shows a similar pattern, where roots may be extended to stems by the addition of a very limited set of suffixes.

Table 5.36: Changes in stem stress in verbs (feet in parenthesis, OFI uderlined)

	Stage I	Stage II	Stage III	Stage IV	Gloss
a.	e.(lú-j̲)	e.(lú-j̲)	e.(lú-j̲)	e.(lú-j̲)	'give-IND.3S'
b.	kó.(n-ì.mi̲)	kò.(n-í.mi̲)	ko.(n-í.mi̲)	kò.(n-í.mi̲)	'enter-IND-2-S'
c.	e.lu.-(lá-j̲)	e.lu.(-lá-j̲)	e.lú.(-là-j̲)	e.lù.(-lá-j̲)	'give-NEG-IND.3S'
d.	e.lu.-ŋe.-(lá-j̲)	e.lu.ŋe.(-lá-j̲)	e.lú.ŋe.(-là-j̲)	e.lu.ŋé.(-là-j̲)	'give-PASS-NEG-IND.3S'

Note that the transition from Stage I to Stage II represents also the transition from syllabic to moraic trochees, which ultimately has the effect of aligning the stem-final syllable (the syllable preceding the OFI) with the head of the right aligned moraic trochee for the vast majority of cases (especially if the singular person marker is interpreted as non-syllabic, cf. §5.3.2.2). The exceptions to this alignment tend to favour main stress on the penultimate mora, rather than on the stem-final syllable, which appears to receive a lower degree of stress at some point in the derivations (evidence here comes from non-finite forms of the verb, cf. §5.3.3.2). In short, however, what we find is that by Stage II the purely morphological pattern of stem-final stress has been

phonologised to become penultimate mora stress.

This shift to the phonology from the morphology means that stress in Stage II no longer signals the morphological structure of verbs as clearly, especially since the exceptions to the conflation of the last pre-OFI syllable and the penultimate mora receive a lower degree of stress in immediate adjacency to the main stress, which would not be very prominent.

As a result, we propose that the marking of the last pre-OFI syllable soon became redundant (between stages II and III), and additional stress retracted to the next prominent morphological position: the root-final syllable, which is what we find for Stage III. This change would have had the important functional role of helping to parse longer verbs, by signalling the edge of the root. It is unclear whether the suffixes that we have identified as stem-extending in Stage IV were also the locus of stress at Stage III (except for passive *-ŋe*, which does not bear stress). Nevertheless, by PDM the stem domain (or extended-root domain) was extended in order to include these suffixes with core root-semantics (see §3.4.3.1).

Indeed, it appears that at every stage of the language there are two types of stress at play, one which is fundamentally morphologically driven and the other which is fundamentally phonologically driven. Their interaction is complex and the predominance of one over the other is not always clear. This said, Mapudungun seems to persistently accommodate stress marking to its morphological signalling function.[54]

5.5.3 Lexicalisation of epenthesis

The issue of vowel epenthesis in the history of Mapudungun is also interesting and relevant to the positioning of stress. The locus for epenthesis seems relatively straight-

[54]Note, for instance, PDM's complex pattern for signalling the derived stem edge (in §4.3.2), and the headedness of compounds (in §4.2.4.1).

forward, breaking up series of onset or coda consonants with a vowel. The quality of this vowel is not always uniform, but appears to be either a mid-central vowel, [ə], or a high central or back unrounded vowel, [ɨ] or [ɯ], all of which we transcribed here as ⟨ɨ⟩. Nevertheless, in some contexts, particularly attested from Stages III onward, the epenthetic vowel seems to become part of the stored, lexical structure of the word, thus receiving stress if in the appropriate syllable of the word.

In Stage I, Valdivia actively states that a much broader array of consonant clusters are acceptable in Mapudungun than in Spanish or Latin, both in the coda and in the onset (cf. p.232 and 1606: 3). This is striking in particular since in the following stage there is basically the opposite claim, that is, that there is a short unstressed vowel that creates a syllable when a series of consecutive consonants are not immediately adjacent to a vowel (Febrés 1765: 7). A closer look at the verbal system, however, appears to display some degree of epenthesis at the morpheme boundary in Stage I (cf. 5.4, 5.5 on p.233).

In Stage II epenthesis seems to be purely post-lexical, as the inserted vowels do not interact with stress. By Stage III, however, nominal epenthesis seems sometimes to occur in the derivation at a stage before stress assignment. At least in Augusta's data (cf. 1903: 4; Table 5.20) we find that disyllabic nouns with an [ɨ] or [ə] in the final closed syllable are stressed as 'spondees', which seems to represent an intermediate stage in the process of lexicalisation of the epenthetic vowel. The full vowel is stressed on the first syllable before epenthesis, and on the epenthetic vowel at a later stage. In the case of the words with an epenthetic in the first syllable, it seems that stress was never shifted onto it, probably because footing could not cross the stressed vowel, preserving final stress irrespective of whether the syllable was open or closed (cf. Table 5.20). When the second syllable was open, it may have contributed to the rise of final open syllable stress and general stress alternation in vowel-final disyllabic nouns.

In Lenz's data, as well as that for the period represented by our own data, final syllable interconsonantal [ɨ]∼[ə] is clearly part of the underlying representation, as it is stressed as any other vowel in a final closed syllable. For epenthesis in the penultimate syllable the situation is less clear, especially where the final syllable is closed. In the cases where the final syllable is open, although there is alternation, the tendency is for the epenthetic vowel not to take stress.

Table 5.37: Nominal vowel epenthesis (in parenthesis) vs. underlying [ɨ]∼[ə], and stress

	Stage I	Stage II	Stage III (Augusta)	Stage III (Lenz)	Stage IV	Gloss
a.	*námn*	*nám(ɨ)n*	*nám(ɨ́)n*	*namɨ́n*	*namɨ́n*	'foot'
b.	*pʌ́í*	*p(ɨ)ʌ́í*	*p(ɨ)ʌ́í*	*p(ɨ)ʌ́í*	*p(ɨ)ʌ́í*	'soul'

In verbs, epenthesis is clearly post-lexical when it applies within the OFI (cf. all the forms of the second person plural, as well as the clitic forms of the dual and plural of the third person), where it is always unstressed (see Table 5.38a). In the case of the vowel which surfaces between the indicative first person singular marker, *-n*, and a preceding consonant (cf. Table 5.38b), we find that: it lacks stress in Stages I and II; it is occasionally stressed in Augusta; and it is quite robustly stressed in Lenz (Stage III) and our own (Stage IV) data. In these later cases, we assume that the vowel must be part of the underlying representation.

Table 5.38: Verbal vowel epenthesis (in parenthesis) vs. underlying [ɨ]∼[ə], and stress in the indicative first singular and second plural

	Stage I	Stage II	Stage III (Augusta)	Stage III (Lenz)	Stage IV	Gloss
a.	*kím-imn*	*kìm-ím(ɨ)n*	*kìm-ím(ɨ)n*	*kìm-ím(ɨ)n*	*kìm-ím(ɨ)n*	'know-IND-2-S'
b.	*kím-(ɨ)n*	*kím-(ɨ)n*	*kím-(ɨ)n* ∼ *kìm-ɨ́n*	*kìm-ɨ́n*	*kìm-ɨ́n*	'know-IND.1S'

One of the major conclusions we can draw from the epenthesis data is the tendency to stress the rightmost closed syllable over the leftmost (in disyllables), so lack of an

epenthetic appears more commonly in the first syllable for nouns. The other key issue is that epenthesis is lexicalised more easily when the morpheme it becomes part of underlyingly has more of a fusional structure (as the case of *-in/-n* '-IND.1S'), that is, when it cannot be decomposed into its constituent parts. This seems rather common sense, as in the case of portmanteau morphemes there is no necessary correspondence of one morph to one meaning, hence freeing up the morpheme from corresponding to the other elements of the paradigm which are agglutinating, and cannot be freely changed without modifying the entire paradigm (as would be the case for *-m-(i)n* '-2P').

5.5.4 Changes and final-syllable stress

The rise of final syllable stress, which we have identified for the PRWD domain in disyllabic non-verbs, the domain of the verb stem, and the first element of compounds, is key to understanding the development of perhaps the most contentious element of our analysis of contemporary Mapudungun: initial-syllable extrametricality (cf.§4.2.3).

The issue of stress on the final syllable of verb-stems (cf. Table 5.39a-b) seems rather uncontroversial, as this is the stated position of main stress – always with some caveats – in the first three stages of the language. Although there has clearly been a shift in the position of this stress, it has never been to the first syllable of the root, except in the case of monosyllables. For the case of compounds (cf. Table 5.39c-f), we only have data beginning in Stage III. In Augusta's work, however, there are only disyllabic stems as first elements, all of which are stressed on the final syllable, regardless of weight. In our own Stage IV data there are also trisyllabic stems as first elements. Here the pattern is different, as it follows that of trisyllables in isolation: final syllables are stressed if closed, otherwise, the penultimate is stressed.[55]

[55]We leave aside the issue of headedness and the level of stress of each element in comparison to the other.

Table 5.39: Stem final stress in verbs (stem=S) and first PrWd-stress in compounds

	Stage I	Stage II	Stage III	Stage IV	Gloss
a.	*kó.n$_S$-ì.-m-u*	*kò.n$_S$-í.-m-u*	*kò.n$_S$-í.-m-u*	*kò.n$_S$-í.-m-u*	'enter-IND-2-D'
b.	*u.má.ɯ$_S$-ì.-m-u*	*u.mà.ɯ$_S$-í.-m-u*	*u.má.ɯ$_S$-ì.-m-u*	*u.mà.ɯ$_S$-í.-m-u*	'sleep-IND-2-D'
c.	—	—	*fa.θú.-tʃaʎ.wa*	*fa.θú.-tʃaʎ.wa*	'spine-fish'
d.	—	—	*tʃa.ŋɨ́ʎ.-na.mɨn*	*tʃa.ŋɨ́ʎ.-na.mɨn*	'finger-foot'
e.	—	—	—	*ma.wí.θa.-tʃe*	'woodland-person'
f.	—	—	—	*a.tʃa.wáʎ.-ruka*	'hen-house'

For disyllabic nouns, although word-initial stress would have been the rule at Stage I, by Stage II the switch to moraic trochees would have left only monosyllables and vowel final disyllables as stress-initial. In formal speeches, this proportion would have been further reduced by phrase-final disyllables, which would have had final stress regardless of this syllable's structure. In Stage III, Lenz's data appears to show the same pattern, where an optional post-lexical rule would have promoted the final syllable of disyllables at the phrase-boundary. Here, however, the rule seems not to be restricted to a particular register. Finally, by Stage IV, the alternation has become much more widespread, leaving the cases of disyllables with initial stress as much more of a rarity. Furthermore, PDM seems to assign stress non-finally only in more formal registers.

Table 5.40: Changes in nominal stress (feet in parenthesis)

Stage I	Stage II	Stage III	Stage IV	Gloss
(rú.ka)	(rú.ka)∼ [...(ru.ká)]$_\varphi$	(rú.ka)∼ [...(ru.ká)]$_\varphi$	(rú.ka)∼ [(ru.ká)]$_\omega$	'house'
(pú.kem)	pu.(kém)	pu.(kém)	pu.(kém)	'winter'
ma.(wí.θa)	ma.(wí.θa)	ma.(wí.θa)	ma.(wí.θa)	'woodland'
a.(tʃá.waʎ)	a.tʃa.(wáʎ)	a.tʃa.(wáʎ)	a.tʃa.(wáʎ)	'hen'

For adjectives, adverbs, determiners and pronouns we have no explicit data for the early stages. In Febrés (1765: 8), the formal speech data never places one of these word categories in phrase-final position, so there is no evidence for stress shifting at Stage II. However, by Stage III the marking of final stress on disyllables within these

word-categories is practically exceptionless (when stress is marked at all). This pattern seems well established in Stage IV as well, where penultimate stress is very rare. In other words, here the final-stress pattern seems to have moved forward more quickly and to have ultimately become more pervasive than in nouns, which still show a fair amount of alternation today (see Table 5.33).

As a result of the processes outlined in this section, by Stage IV, stems and words appear to dependably be stressed on a first syllable only if they are monosyllabic. The fact that trisyllables in the initial position of compounds are not invariably stress-final, following the moraic trochee pattern, points to the issue no longer being just of preference for the final syllable but rather for actively avoiding the initial one (i.e. initial syllable extrametricality).

Although the data for final stress in the first element in compounds does not stretch back far enough, it is possible to see the stress-final pattern in verb-stems as far back as we have records of the language. In this sense it is not unlikely that the model for stems (and possibly for the first element in compounds) may have spread to other monomorphemic forms in context. The utterance-final rise in formal speech may have been the first possible context for this spreading, which moved relatively quickly across to all non-verbal disyllables. Such a pattern is likely to have been facilitated by the polysynthetic nature of Mapudungun, whereby the difference between word and morpheme boundaries are less absolute, a fact that is supported by the gradient nature of culminativity across stages of the language.

As we have argued in §4.5.2, this avoidance of initial stress in Stage IV can be overridden when the basic right-aligned moraic trochee footing (still evident on the surface among verbs) is assigned post-lexically in casual, non-formulaic speech.

5.5.5 The context of change

So far, in the preceding sections, we have only examined language internal factors which may affect the position of stress in different word categories of historical Mapudungun. Even though we have occasionally considered the influence of Spanish on the stress of Mapudungun words (see, for instance p. 93), here we summarise the general contact conditions for the entire period and asses the possible influence of the European language upon the native one.

Although Spanish-Mapudungun bilingualism only became commonplace in the twentieth century, the last one hundred years have seen a steep decline in both the uses and transmission of Mapudungun (see Chapter 1). Much of this process is likely related to the modernisation of the traditional Mapuche occupations not going hand in hand with the establishment of diglossia, but simply with the abandonment of the native tongue (see Gundermann et al. 2011).

Adalberto Salas, writing two decades ago, tells us that 'The effects of systematic, permanent contact with Spanish are displayed at all levels of today's Mapuche language' (2006 [1992]:28). Evidently, this includes lexical borrowings at a massive scale, proportional to the cultural borrowing that Mapuche culture underwent: essential nouns and verbs of indigenous lifestyle such as *kaweʎu* 'horse' (Ch.Sp. [kaˈʋajo]), *ufisa* 'sheep' (Ch.Sp. [oˈʋexa]), *laɲtʃika* 'lentil' (Ch.Sp. [lenˈtexa]), *asaon* 'hoe' (Ch.Sp. [asaˈon]), *kansan* 'to tire' (Ch.Sp. [kanˈsar]), etc. We further find borrowing of adverbials, such as *masiaw* 'too much' (Ch.Sp. [ðemaˈsjao]), prepositions such as *ata* 'until' (Ch.Sp. [ˈahta]) and conjunctions such as *sinu* 'otherwise' (Ch.Sp. [ˈsino]).[56]

Aside from these borrowings, we find that the influence of contact reaches to the

[56]The phones given for Chilean Spanish correspond losely to those given by Sadowsky & Salamanca (2011) for the present day form of the language, not the reconstructed pronunciations for the time of borrowing, for which we might consult Hasler & Soto (2012). The examples are of the unmarked stress pattern which stresses the penultimate mora of the word (cf. Harris 1996; Roca 2005).

level of the morphosyntax. While the language described by Valdivia shows no sign of an article system, present day Mapudungun has taken the demonstrative *fej tʃi* or *tʃi* 'this' as a form of the definite article and the numeral *kiɲe* 'one' as an indefinite article. It has also been noted that noun incorporation is used less and less (Salas 2006: 29), while the AVO argument structure, coupled with the direct *-fi*-suffixed person marking, is on the rise, as would be typical of transitive forms in Spanish (Zúñiga 2006a: 488).

There is no doubt that the most radical influence of Spanish on Mapudungun must follow 1883 and the end of the 300 years of the Arauco War (cf. Bengoa 2000), when the Mapuche were forced to settle onto *reducciones* and become a part of national life (around Stage III). The adoption of the morphosyntactic features outlined above no doubt corresponds to this later period of the history of the language. Nevertheless, some degree of influence must have occurred from the initial contact of the two languages upon Spanish arrival to the Mapudungun-speaking territories (1536). Although early relations were mostly bellicose for the Mapuche who spoke central varieties of the language, speakers of the northernmost varieties were mostly conquered or forced into alliances with the Spaniards. Most of these later varieties, however, do not appear to survive into the present day, even when they may have made it into the historical descriptions. For the preserved varieties, linguistic contact was based on commerce and evangelisation during truce periods, as well as through the taking of prisoners and slaves on both sides of the conflict during the periods of outright hostility (Durán & Ramos 1986; Hasler & Soto 2012).

Much of the content words relevant to the changes in the Mapuche lifestyle during the conquest (agriculture, sheep-herding, war, and governance) were borrowed early and most likely with little direct contact with Spanish speakers among the general populace. As a result, it is highly doubtful that such words would have been incorporated into Mapudungun following the Spanish stress patterns. It is clear that for

segmental patterns, the borrowings of this period tended to transpose the Spanish inventory onto the Mapudungun one, adding no non-native patterns (cf. Hasler & Soto 2012). Although the early grammars give us no evidence for the stress patterns, we assume borrowings would have been adapted to the native system, as is the case, for the most part, even today (cf. Table 3.7, p. 96).

As a result, we assume that the change in the basic foot pattern between Stage I and Stage II cannot simply be attributed to contact conditions, but must be the result of language internal factors such as those suggested in §5.5.1. Even though the moraic trochee pattern is precisely that of unmarked words in Spanish, it seems doubtful that these patterns would have kicked off the change, even if they may have helped reinforce it later on.

As regards the changes in phrase-final disyllables in Stages II and III, contact with Spanish seems completely irrelevant. Final stressed vowels are rare in Spanish nouns and adjectives, corresponding to borrowings themselves, predominantly from French (cf. [me.ˈnu] 'menu', [kli.ˈtʃe] 'cliché'). An interesting possibility, however, is that the preservation of stress-initial disyllabic nouns, as well as the percept of 'correctness' for these forms, may be bolstered by Spanish bilingualism at Stage IV. In other words, although we would expect the tendency we see in the peripheral word categories – stressing final vowels in disyllables – to spread to nouns in all syntactic positions, this does not seem to be occurring at the same rate. In the context of practically universal Spanish bilingualism, this seems less surprising, as speakers would have abundant data from new borrowings and from a parallel phonological module to assume that the penultimate mora continues to be the correct position for stress, and to apply a post lexical rule to these at the right edge of the phrase.

5.5.6 Preservation vs. change

Although here we have focused predominantly on reconstructing the major changes that have taken place in the 400 years of documented Mapudungun, at least as important as these are the elements that have avoided change in the same period. To this effect there are three persistent traits of the prosodic system that must be highlighted. The first of these is the preponderance of the right edge of prosodic domains, or in a parametric sense, the preservation of 'end-rule right' throughout the period. The second is the preservation of the trochaic pattern despite changes in the weight sensitivity of the language. The final, and perhaps most distinctive preserved trait is that of final stress in stems. Although the domain of the stem is re-envisioned throughout the history of the language, we find a clear tendency to demarcate its right edge. In the cases where the stem domain is simplex, including the root-morpheme alone, there appears to be some degree of stress on the final syllable at all stages in the language.

5.5.6.1 End-rule right

Throughout the language's attested history, the right edge of a prosodic domain seems to be the locus of alignment for feet (or syllables, in the cases where we have stipulated morphologically determined stress). This applies both to verbs, and to simplex and complex nouns. Clearly, the question of whether it is the absolute final syllable that is stressed or the head of a right-aligned trochee (syllabic at Stage I, moraic later) is one that causes important noise in the data, especially for disyllabic nouns. However, our global assessment of each one of the different cross-sections we have obtained for the language shows the general pattern to be one of right-alignment. In this sense, our account differs from the most influential contemporary one: Echeverría & Contreras (1965), which has been taken to show that feet align to the left edge of words.

Viewed from the perspective of contact with Spanish, this feature causes no conflict

– at least at the word level – as it would have fallen in with the prestige language's similar tendency to align feet to the right.

5.5.6.2 Left-headed feet

Another fundamental difference we find with the standard interpretation of Mapudungun stress as presented in Echeverría & Contreras (1965) relates to the headedness of feet. Throughout the four stages we report on here, it appears that the basic foot-structure of the language is trochaic. The exceptions to this rule are context and register-bound in nouns, and circumscribed to peripheral word categories elsewhere. In verbs, although occasionally the right-aligned trochee may be demoted in favour of stem-stress, a final open syllable is never stressed.[57]

As in the case of end-rule right, the influence of the incoming language presents no conflict, the default stress pattern being clearly trochaic as well (in this case moraic). Furthermore, especially in the case of the spreading of final-vowel stress in disyllabic nouns at Stage IV, it may be the case that widespread bilingualism actually prevents the shift, reinforcing the penultimate mora as the locus of stress. In §4.4.1 we suggest that a post-lexical rule trumps initial extrametricality in such disyllables, this being precisely the level at which we would expect contact-induced changes (or lack thereof!) to surface (cf. McMahon 2000, Bermúdez-Otero).

5.5.6.3 Stress as stem-edge demarcation

Another persistent prosodic feature we present here is that of sub-lexical domains aligning stress to the right edge. Although Spanish, the incoming language, does show features of stress following sub-lexical morphological domains (cf. Roca 2005 for non-verbs and Oltra-Massuet & Arregi 2005 for verbs, among others), this marking

[57]For stages I and II, finally stressed imperative suffixes *pe* and *ŋe* are considered independent prosodic words, thus receiving stress as monosyllables.

does not show the same type of interaction with an independent word-level stress assignment system, as in Mapudungun. In the Amerindian language, stress appears to consistently mark a stem-final syllable (or foot in Stage IV). Where the confluence of penultimate mora stress and stem-final stress (defined as the PrWd minus OFI suffixes) becomes practically exceptionless (at Stage II) the domain of the stem stress is re-defined (apparently as the root-morpheme alone) in order not to be conflated with the word-edge stress and to continue to highlight the morphological structure of the word.

As we have suggested elsewhere (§4.5.3), this pattern may be more in line with the demarcative function of stress than the traditional rhythmic one which we assume for Germanic (see Chapter 7). In other words, the possibility of having a fairly complex internal morphological structure within the prosodic word – a trait of polysynthetic languages – ought to bring with it the tendency to accentuate prosodic cues to this structure. The ultimate gain of such a system would be to facilitate its parsing, much as, for example, phrasal accents help to parse sentence structure.

The fact that attested Mapudungun has tended to preserve the boundary marking within complex nouns and verbs gives further grounding to the contemporary claims for demarcative stress. Ultimately, this feature also reinforces the diachronic pattern by which stress is subordinate to morphological structure, rather than the opposite, as we find for the English data presented in Chapter 7.

5.6 Summary and conclusions:

Polysynthesis and domain pertinacity

This chapter has examined most known evidence for Mapudungun's phonological system up to the early twentieth century, and ventured a plausible set of rules for stress

assignment at three distinct stages. It is, of course, difficult to ascertain whether the differences between the sets of data are an artefact of the methods for data-gathering and the perception of the researchers involved, or whether they are actual historical differences. Unless there are contradictions in the data from the same period, we have taken the grammarians' reports at face value.

With an initial assessment of the data for the first three hundred years of recorded Mapudungun on hand, alongside the new data as presented and analysed in chapters 3 and 4, we assessed the commonalities and differences between the four outlined stages, attempting a diachronic view of the relation of stress and morphological structure.

The major changes we identified in the language occur early in the recorded history, when relations between Spaniards and the natives were less fluid, and are therefore unlikely to be contact-induced. Two of these changes were the development of weight-sensitivity and the re-definition of the domain of the stem. Both of these processes appear to be related to the disambiguation of the partial conflation of stem and word-level stress assignment.

The third change – lexicalisation and stressing of epenthetic vowels – seems slightly later, as it is first attested at Stage III. Here, the process seems to be most robust where the morphological structure of the words is less transparent. Therefore, monomorphemic nouns (cf. *mamɨ́ʎ* 'wood') and portmanteau morphemes (*-ɨ́n* '-IND.1.S') are more likely to undergo lexicalisation of the epenthetic vowel, while decomposable inflections are less likely to do so, supported by the transparency of each morpheme's meaning throughout the paradigm (cf. *-ɨ́-m-ɨ-n* '-IND-2-EPENTH-P). In this case, as well, we find no particular reason to consider the change anything but language internal.

Finally, the shift of stress from the first to the second syllable of vowel-final disyllables in non-verbs appears to be a phrase-final phenomenon, and is attested starting

at Stage II. By Stage IV, however, the pattern seems to have become predominant in words in context, suggesting that it has become a basic pattern as a result of the rise of a ban on word-initial stress: initial syllable extrametricality. Here, we have suggested that Spanish foot structure may well have contributed to the preservation of the stress-initial pattern in nouns, under the form of post-lexical footing of a moraic trochee, which is manifest predominantly at the right edge of the utterance, and in informal, non-formulaic speech.

Although the reconstruction of these patterns of change are key to understanding the diachronic morphoprosody of Mapudungun, we believe that even more fundamental typological issues are raised by those patterns which persist amidst the changes. What we refer to here as *pertinacity* (Dresher & Lahiri 2003) is, precisely, the characteristic of elements of the grammar which are preserved – or more radically even: protected – while other aspects of the system undergo more or less extensive restructuring. Such pertinacious elements must somehow be deemed more basic or essential to the structure of the morpho-phonological system, coming to the surface time and again.

For Mapudungun, the main elements which show pertinacity are right-alignment of feet (End-Rule Right), foot left-headedness, and demarcation of the stem-edge via stress. Although the first two of these factors fall in with the pattern we find in Spanish, the latter is unique to Mapudungun in its complex interaction with word-level stress. Although we have seen that there is a shift within what we define as the stem-domain in Mapudungun, this is the result of the loss of information entailed by the conflation of word and stem-edge stress. The shift in the position of stress to the next relevant morphological boundary (the root-edge) represents a reestablishment of stress' morphological cuing function, a characteristic of stress systems termed *demarcation*.

The demarcative function of stress in Mapudungun, and its pertinacity across the four stages of the language, is one of the more interesting findings in both the synchronic

and diachronic data presented in the preceding chapters. If we, furthermore, take into account the polysynthetic nature of the language, the motivations for this type of phenomena become more transparent. If the ideal polysynthetic language has single words as full sentences – as is no doubt possible for Mapudungun – word-stress may have more features of the phrasal type and less of the word-type. As a result, it seems that Mapudungun places a greater value on demarcation (which is typically a phenomenon related to the phrasal level), than on culminativity (which tends to apply within the PrWd).

The issue of lack of clear culminativity is present in the literature overall, where we find alternation between the different grammars as regards the preponderance of stem vs. word level stress. This is perhaps clearest in Smeets's claim that there may be two main stresses in longer words (cf. §2.4 p.2.14, and Smeets 2008: 64). The fact that our own data at Stage IV finds the same lack of clear culminativity at the morphosyntactic word level, points to a deep-seated tendency – most likely related to the language's morphological type – for sacrificing culminativity and rhythmic structure in order to highlight the morphological structure of words. This pattern, furthermore, seems to withstand the test of time even in adverse contact conditions with a language such as Spanish for which maximal prominence intuitions are 'crystal clear' (Hualde & Nadeu forthcoming: §2).

(5.33) Summary findings for diachronic development of stress and morphology in historical Mapudungun:

- Major changes:
  - **Weight sensitivity:** syllabic to moraic trochees (Stages I to II).
  - **Stem domain:** PrWd minus OFI to root + core suffixes (Stage II to IV).
  - **Epenthesis:** post-lexical rule to lexicalisation (Stage II to IV).
  - **Word-final open syllable stress:** phrase-final to register-dependant (Stage II to IV).
- Pertinacious phenomena:
  - **End-Rule Right:** both in stems and at the word level.

– **Left-headed feet:** despite changes in weight sensitivity.
– **Stem-edge demarcation:** emphasis on demarcative over rhythmic and cumulative role for stress.

Part II

Prosodically conditioned morphological change:

Prefixation and Foot Structure in Early English

Chapter 6

Early English Morphoprosody in Context

In contrast with Mapudungun, the history of English is far more extensively documented and to a much greater historical depth. This presents us with both advantages and limitations. First of all, the historical depth and wealth of primary and secondary sources allows us to situate phenomena much more precisely. At the same time, however, the fact that English has been abundantly studied, forces any study of the language to be further restricted in scope, making larger, sweeping claims less viable. That issues may be explored and debated in such detail means that the language's phonology has, both in the past and present, been an important testing ground for linguistic theory (see Carr & Honeybone 2007).

Keeping these issues in mind, we do not endeavour to provide a full account of the relationship between stress and morphological structure throughout the language's history – as we have attempted to do for Mapudungun – but rather, we focus on a very specific stage and phenomenon: the stress-patterns and diachronic development of verbal prefixes in the Old and Middle English periods.

Here, the counterpoint with Mapudungun is particularly illuminating, as in both cases we are dealing with affixation at the prosodically strong edge of the word. While in Mapudungun verbs were examined with an eye to suffixation in the context of persistent right-edge stress, in Early English the focus is on prefixation at a predominantly stress-initial stage of the language. Although the morphological and prosodic boundaries we focus on are fundamentally similar for the two languages, English presents a path of development that is diametrically opposed to that of the Amerindian language. It will be claimed here, that these differences are grounded in more general features of English morphological typology, and the structural importance the language places on prosodic structure.

Some context is necessary regarding the overall history and structure of the language. This chapter provides an introductory tour of some of the more general facts related to the language's genetic affiliation and contact conditions during the relevant period (§6.1). It moves on to provide some basic notions regarding the place within morphological typology that has been claimed for English at different stages of its development (§6.1.2). Finally, it looks into the role that Germanic stress appears to have had in the transitions between these stages (§6.1.3).

6.1 Situating Early English and the evidence for its history

Old and Middle English (hereafter OE and ME), dubbed here 'Early English', are considered the historical antecedents of the varieties of the language spoken today (Present Day English: PDE).[1] Even when the first well established attestations for a

[1]More precisely, however, PDE stems from specific – although often shared – features of individual dialects of OE and ME. Different dialects of PDE may also show differences in the inherited features, especially in relation to ME (Laing & Lass 2006: 420-1). There are, furthermore, features that come

West-Germanic language in the British Isles are only found towards AD 700, the OE period is usually held to begin in AD 449, Bede's date for the *Adventus Saxonum* or the invasion of present day England by Germanic tribes (purportedly the Angles, Saxons and Jutes). The Norman Invasion, in 1066, is commonly given as the major event marking the transition between the OE and ME periods. Finally, the symbolic end of the ME period is placed in 1476, the year William Caxton established the first printing press in England, an event that bolstered the growing Chancery Standard dialect of London, and opened the way to Early Modern English (EModE).

6.1.1 Genetic afiliation, contact and the development of Early English

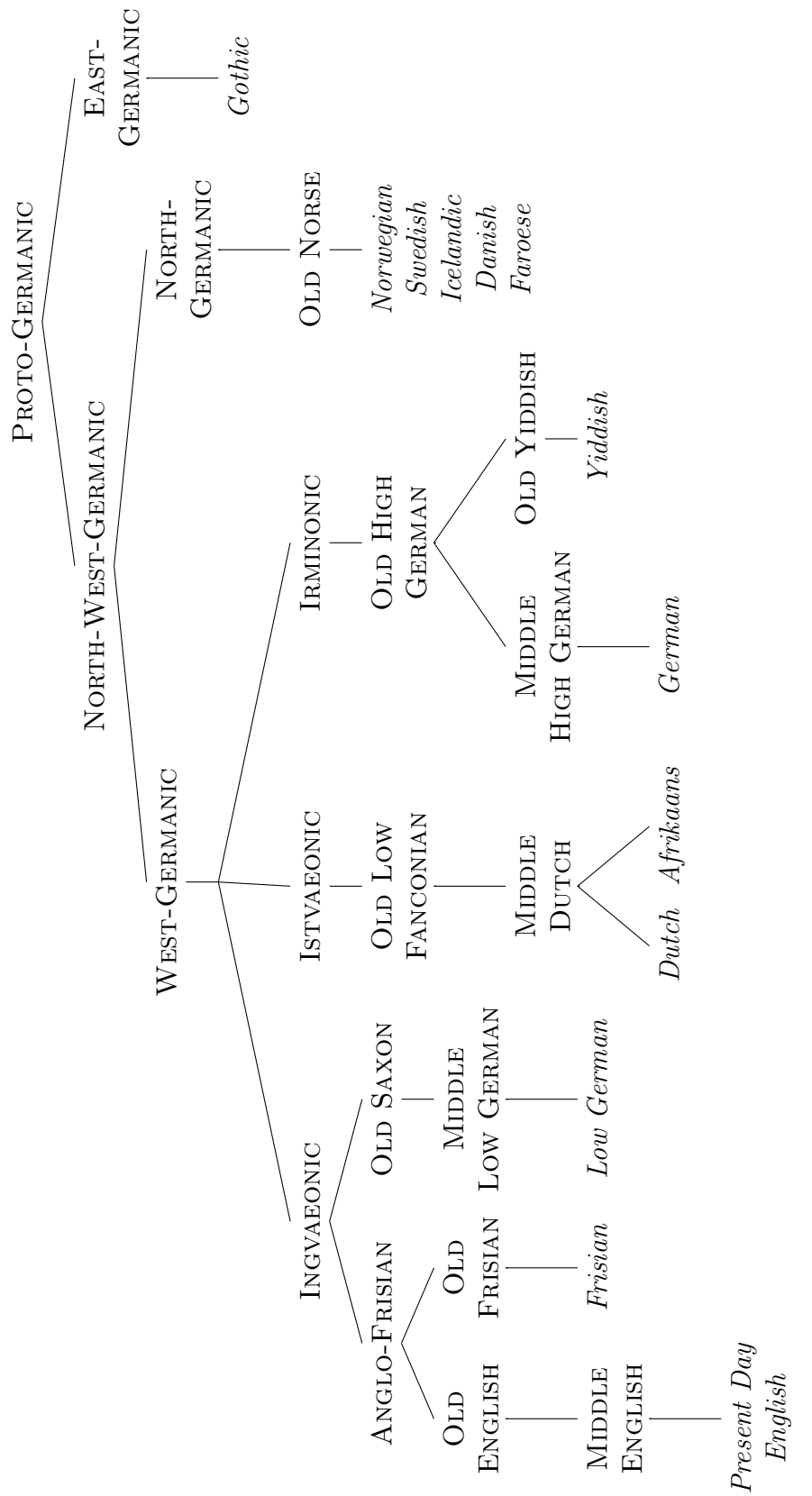
Although there is some debate regarding the actual geographical provenance of the tribes which invaded and occupied the British Isles during the fifth century AD, the filiation of their language is uncontroversial, fitting within the Germanic sub-family of Indo-European (IE). More specifically, English stems from the West Germanic branch of the family which is further subdivided into into Ingvaeonic (North Sea Germanic), Istvaeonic (Weser-Rhine Germanic, or Fraconian) and Irminonic (Elbe or Alpine Germanic). English belongs to the Anglo-Frisian sub-division of the first of these groups (see Fig. 6.1).[2]

The first attestations of OE are inscriptions in the runic alphabet known as *Futhorc* and may date as far back as the fifth or sixth centuries (Hines 1990). The material, however, is usually limited to single names or short phrases of difficult interpretation. The Christianisation of the fledging Anglo-Saxon kingdoms – which began in the late

from other contact languages such as ON and NF.

[2]For the position of English within Germanic given here, see Lass (1994: 13-16) and Harbert (2007: 6-9) . For discussions of the position of Germanic within Indo-European see, among others, Bammesberger (1992); Ringe (2006).

Figure 6.1: Simplified family tree for Germanic



sixth century with St. Augustine – brought with it the Roman alphabet. Soon after, a thriving written tradition developed in the vernacular. The records for OE are, in fact, the most abundant for an early Germanic language and make the language one of the best documented vernaculars in early medieval Europe.

The earliest period of well attested English (EOE) begins roughly in the eighth century and is usually deemed to last until the end of the reign of King Alfred of Wessex (871-899). This early period was characterised by the lack of political cohesion in the Anglo-Saxon Heptarchy, which was also reflected in the marked differences between regional linguistic varieties. The question of OE dialectology is a thorny matter at best, especially considering the limited spectrum of society with access to the written word. Nevertheless, four major dialects are typically claimed in the literature: Kentish, West-Saxon, Northumbrian and Merican (the later two usually grouped under the cover-term 'Anglian' (Hogg 2006; Toon 1992). Despite these differences, however, OE seems not to have been too substantially influenced by the languages it entered into contact with, which at the earliest stages would have been the native Celtic languages of the British Isles, and Latin (see Kastovsky 1992: 301-20 for a summary).

The end of the EOE period is associated with the political, legal and educational reforms set forth by the Alfredian court, which paved the way both towards a unified Kingdom of England, and towards the establishment of a literary standard. The narrow victory Alfred achieved against the invading Danes (at the Battle of Edington in 876) bolstered the power of the Kingdom of Wessex, but also highlighted the instability of the English legacy. This later fact led to a number of cultural campaigns, among which the creation of a court school and the focus on the use of the vernacular are key to our purposes. To this we add that much of the prose tradition of OE can be traced back to Alfred himself and the original works and translations he either composed or commissioned.

Although the early claim (Sweet 1871) that the rise of an OE literary standard occurred in the court of Alfred has been widely refuted (see Wrenn 1933; Gneuss 1972; Hogg 2006), there is no doubt that the waxing of West-Saxon influence and the reevaluation of the vernacular that Alfred spearheaded had precisely this effect within about one hundred years. The literary standard that the bulk of the late OE (LOE) is composed in, corresponds to a variety that appears to have emerged from the scriptorium at Winchester during the bishopric of Æthelwold (963-984), and specifically through the work of Ælfric (see, Quirk & Wrenn 1957: 5, Gneuss 1972, Hogg 2006: 399-401).

Another key issue that sets EOE apart from LOE is the growing influence of Scandinavian. One hundred years before the organised Danish invaders were defeated by Alfred,[3] Old Norse (ON) speaking bands had begun raiding and ultimately settling throughout England and Scotland. One hundred and forty years after Edington, in 1016, Cnut of the Danes sat on the throne at Winchester. Although the extent of the influence of ON on LOE is a matter of some debate,[4] it is clear that by the late ME period, elements of the North-Germanic language had penetrated into some of the core aspects of English (particularly in the territories under the Danelaw, but by no means limited to them). Not only were a large number of essential content words borrowed into the language (i.e. *egg, sister, sky, take*),[5] but we also find borrowings in the pronominal system (notably, *they, their* and *them*, Morse-Gagne 2003) as well as in parts of irregular verbal paradigms (the most prominent being the *are*-form in the verb *to be*), most of which do not appear to have had a real foothold in the language

[3]The date givin by the *Anglo-Saxon Chronicle* for the first Viking raids is AD 787.

[4]While Poussa (1982) holds that the intimacy of the contact between OE and ON is tantamount to creolisation, the slow percolation of ON words into OE and ME argues against this (see Kastovsky 1992: 320-36). Another problem with such accounts is the fact that the languages were likely somewhat mutually intelligible and their speakers coinhabitance would have required more than just a utilitarian contact code, but rather a degree of bilingualism (Thomason & Kaufman 1988).

[5]A conservative estimate places this number at about 900 words (Björkman 1900; Geipel 1971; Hansen 1984), although only 150 or so are attested in OE (Kastovsky 1992: 321).

until the LOE stage. It has also been claimed, that the rise of post-verbal particles (i.e. phrasal verbs, cf. Hiltunen 1983) and the loss of verb-second (Kroch et al. 2000) and OV word order (Trips 2002) – all of which began in OE – were bolstered by contact with ON, showing their effects most clearly in the ME period.

Although the seminal event that ushers in the ME period is the Norman Conquest, early claims that it 'changed the whole course of the English language' (Baugh 1935: 105) or later ones that claim ME underwent creolisation under the influence of Norman French (cf. Bailey & Maroldt 1977), seem to have somewhat overstated the issue (Görlach 1986; Thomason & Kaufman 1988; Dalton-Puffer 1995; Fennell 2001: 125-31). What seems clear is that the incoming Normans brought their language (as well as the reestablishment of Latin) to the court and administration of late medieval England, whilst the vast majority of the populace continued to speak varieties of a Germanic language which followed – in an uninterrupted continuum – from the dialects of OE.

The new linguistic situation of England in the two or three centuries following the Norman conquest might be best characterised as one of diglossia (Fennell 2001: 117). Although there was likely a small core of the nobility that had no fluent knowledge of English, the majority of the common folk would have been in the opposite situation. Low and mid-level bureaucrats, military men, and clerics no doubt had to be fluent in French and English to some degree, though the context for use of each one of the languages was strictly delimited. This split is evident in the types of borrowings that English took from Norman French.

It must be noted that, although the influx of new lexical material was by all accounts substantial, it was also restricted to specific contexts: warfare, governance, high culture, among others. Furthermore, the adoption was limited, by and large, to content words, rather than to functional elements. Although a number of suffixes were re-analysed from borrowed words and used natively later on in the ME period (cf. *dis-*, *in-*, *-ment*,

Table 6.1: French borrowings into Middle English

	OE	ME	PDE
a.	*cyne-helm*	*croune*	'crown'
b.	*burh*	*castill*	'castle'
c.	*here*	*armee*	'army'
d.	*scop*	*poiet*	'poet'
e.	*fægernes*	*bealte*	'beauty'
f.	*hūs*	*mancione*	'mansion'
g.	*hlāford-swica*	*traitre*	'traitor'
h.	*blēo*	*coleour*	'colour'
i.	*ge-mōt*	*parleamente*	'parliament'

-ness), these were mostly part of a learned register, at least for the first generations of their adoption. There was no borrowing of pronouns, prepositions, determiners or syntactic patterns.

At the phonological level, contact with French seems to have had only a somewhat limited influence on segmental inventories (cf. Lass 1992). All in all, it seems clear that, from a structural standpoint, the Norman Invasion had far more limited impact on English than contact with the Vikings.[6]

In terms of actual texts, early Middle English (EME) is rather sparsely documented. The arrival of the Normans halted the production of English language writing, which had exploded in the post-Alfredian period, shifting mostly to Latin and French during the first two centuries of their rule. The language of the court continued to be predominantly French well into the LME period, although its hegemony was called into question by the 100 Years War, whose beginning in 1337 usually marks the end of EME. Already at the start of the 13$^{\text{th}}$ century, however, the Anglo-Normans had lost their continental territories, becoming progressively delinked from the varieties of

[6]Some suprasegmental issues – particularly stress and footing – are discussed in the main chapter on prefixation, Chapter 7 (§7.5.1.2).

French spoken across the Channel. As a result, French began to slowly lose currency among the nobility, needing explicit reinforcement through teaching, but inevitably being perceived as more and more 'provincial' by the speakers of the growing *Île de France* standard (Baugh 1935: 137).

The expansion of the middle classes during the LME period also brought with it the aspirational use of French by a larger, predominantly English-speaking group attempting to gain status, influence or riches through contact with the nobility. Consequently, this is also the time when the largest amount of borrowing occurred, since French words were widely used non-fluently in order to signal upward mobility. The rise of urban middle class groups also meant that a handful of the numerous coexisting written forms of the language became more stable in particular regions or cities. The most prominent among these was the Chancery Standard of London, which would ultimately become the main predecessor of EModE.

6.1.2 Changes in Early English morphological typology

Although in both nouns and verbs PDE shows a very modest amount of inflectional morphology, this is by no means the case for the earlier stages of its history. Looking all the way back to its IE roots, we find that Sanskrit has verbal paradigms with as many as 126 finite forms, and eight different case markers for nouns. PDE, on the other hand, has only three finite verbal forms (*-s, -ed, -∅*), and inflects nouns only in the genitive case (*-'s*). Clearly, OE and ME represent stages in the transition between these two extremes.

The early IE languages can be characterised as both synthetic and fusional. The first characteristic – which is a prerequisite of the second – refers to a language's tendency to mark different grammatical categories within one word, thus allowing a single core meaning to appear in different forms depending on particular grammatical relations.

The second characteristic, fusion, refers to how 'the expression of different categories within the same word is fused together into a single, unsegmentable morph' (Comrie 1989: 44). In other words older IE languages show a fair amount of allomorphy, as the marker for a single category may surface with a completely different phonological shape depending on the other categories it surfaces with (a fact that is further complicated by the presence of theme morphemes in nouns). These characteristics are still typical of OE inflected forms such as *cyning-as* 'king-NOM.P' vs. *cyning-um* 'king-DAT.P', where we note that plurality cannot be considered to have a separate exponent from case.

PDE, on the other hand, tends to be considered closer to the isolating or analytic end of the spectrum. The main characteristic of such languages is the overall scarcity of their affixational morphology. Although the paucity of inflectional morphology in the language may justify this categorisation to some extent, the derivational or word-formation processes of PDE are not typically isolating (cf. *read* ∼ *re-read* ∼ *read-able* ∼ *read-abil-ity* ∼ *re-read-abil-ity*).

OE, despite not being as far along the fusional spectrum as IE, is typical of older Germanic languages in showing a fair amount of verbal inflection (eight possible finite forms), four robust cases for nouns and pronouns (nominative, accusative, genitive, dative and sometimes ablative and instrumental), as well as three genders and singular and plural marking (with dual marking in the pronominal system). The adjectival system of OE is also typically Germanic as it presents both weak and strong forms, corresponding to the absence and presence of definiteness markers, respectively (as in present day German).

Although the inflectional distinctions we mention here for OE are clearly present in some forms within older dialects, both nominal and verbal paradigms show abundant overlap in the actual phonological shape of the suffixes (cf. NOM and ACC forms in Table 6.2). The ME period is characterised by further advances in this direction, with

the merger of noun classes and loss of gender and case distinctions (cf. Table 6.2), as well as the erosion of a number of the forms within the verbal paradigms (see for instance, Lass 1992: 100-147).

Table 6.2: Example (simplified) changes in nominal paradigms from OE to ME (masculine *a*-stem 'stone')

	OE		ME	
	Sing.	Plur.	Sing.	Plur.
NOM	*stān*	*stān-as*	*ston*	*ston-es*
ACC	*stān*	*stān-as*	*ston*	*ston-es*
GEN	*stān-es*	*stān-a*	*ston-es*	*ston-es*
DAT	*stā-ne*	*stān-um*	*ston*	*ston-es*

These changes – attested only from the OE period onwards but likely to have begun earlier in the Germanic prehistory of the language – have been characterised as a form of 'analytic drift'. Such a shift is considered to be a process by which grammatical information is moved from word-level morphology to syntax (cf. Sapir 1921, Samuels 1972, Comrie 1989: 44). The major risk of a position such as this is that it may be taken as a form of teleological change, whereby a certain typological change is seen as a shift to a more 'natural' or 'simpler' state. Although there is no doubt that markedness of certain features has an incidence on language change, the result of typological changes is by no means an instance of entropy, and more focused studies – such as those presented here for prefixes – show processes of change to be substantially more complex than what these bird's-eye views would imply.

6.1.3 Stress and language change in Early English

Speaking of PDE, Michael Hammond tells us that 'it has become clear that English enjoys a remarkable prosodic organization that plays a role in virtually every aspect of its phonological system' (2006: 411). This assessment is no doubt true for the diachrony of the language as well, with stress being an important factor in practically every major

morpho-phonological change since the split of Germanic from its IE stem. The radical changes to the inflection paradigms of the language which are first attested in OE, and continue throughout the ME period, are also undoubtedly related to the disparate evolution of stressed and unstressed syllables in Germanic. This positional asymmetry in the development of the language is so prominent that it leads van Coetsem (1996: 70) to claim that English belongs at the pinnacle of 'dominant accent' (D) type languages. Such different paths of development in stressed and unstressed syllables are, however, by no means necessary cross-linguistically, as the opposite language types (i.e. 'non-dominant accent' (ND) languages) are also well attested (cf. §8.1.2.2).

One of the defining characteristics of Germanic as a sub-group of the IE languages is the shifting of stress to the initial syllable of all word categories except verbs. In the latter case it is the initial syllable of roots that takes main stress, thus generally avoiding verbal prefixes.[7] As we shall see, the distinction between the stressing of nominal and verbal prefixes is key to their evolution in English. However, more important to the overall development of the language is the fact that main stress was at the left edge of the word or root, while the right word-edge did not bear stress. Since OE was, by and large, a suffixing language, the consequences of this lack of stress and the concomitant tendency for unstressed syllables to reduce had a huge influence on the fate of English inflectional morphology throughout OE and ME.

Although the details of the changes in the OE and ME inflectional system are complex and not entirely relevant to our purposes here, it is clear that unstressed syllables saw a number of waves of change that can be characterised as 'reduction' or 'weakening' i.e. vowel centralisation and loss, cluster simplifications, coda loss (cf. Minkova 1991, 2003; Minkova & Stockwell 2009). Evidently this was not a teleologically motivated conspiracy against inflection, but rather a fundamentally phonological process with

[7]See Lahiri et al. (1999: 335-41) for a summary of positions on stress in Common Germanic. See §7.1.1 for a view of the pre-history of Germanic and IE prefixation.

radical, unexpected, structural consequences. In Roger Lass's words:

> 'Phonological change 'forced' some restructuring of the morphology simply by eroding distinctions. The movement of English towards a more analytic type was supported by purely phonological developments, in principle unrelated to the morphology. The fact that Old English was a suffixing language simply put the bulk of its morphological markers in vulnerable positions.' (Lass 1992: 105)

While other IE languages preserved inflectional endings, and polysyllabic words overall, English and its historical antecedents tended to reduce phonetic material to the right of the stressed syllable (or of the most prominent foot, cf. §7.5.1.2). Hence, a monosyllabic PDE verb such as *melts* is equivalent to the trisyllabic Sanskrit one *márdati*, and PDE *young* would have been *juvencus* in Latin (Fulk 2008: 143).

It appears that there is independent motivation for the reduction of the inflectional categories of earlier stages of the language, which need not appeal to the influence of NF or ON. However, it seems quite feasible that contact provided some of the repair strategies which ultimately shifted grammatical relations from reliance on suffixation to dependence on word order and periphrastic constructions (cf. Hiltunen 1983; Kroch et al. 2000; Trips 2002) .

The changes in suffixation from OE to ME, in particular in the inflectional system, are therefore best characterised as reduction processes related to stresslessness. However, in the following chapter we show that the same period saw the loss not only of a vast number of forms at the right edge of the word, but also the loss of the better part of an entire category of prefixes. Such a loss, which includes both stressed (nominal) and unstressed (verbal) forms, cannot be characterised simply as a process of weakening (contra Lutz 1997, see 7.3.4). Our claim is that these changes are stress-related, but in contrast with inflectional suffixes, prefixes actually follow the opposite pattern, where

it is not weakness but strength of the phonological makeup of morphemes which seals their fate. In this sense, there appears to be an important role not only for reduction of unstressed syllables, but also for clash-avoidance in some of the broader typological changes undergone by English (see, for instance, Speyer 2010).

6.2 Changes in Early English prefixation

The fundamental changes that have taken place in the history of English prefixation can be glimpsed by examining a fragment of one of the language's earliest attested poems:

(6.1) Prefixation in *The Dream of the Rood*, lines 46-9:

Þurhdrifan	*hī*	*mē*	*mid*	*deorcan*	*næglum.*	*On*	*mē*	*syndon*	*þā*	*dolg*	*gesīene*
Through-drove	they	me	with	dark	nails	on	me	are	the	scars	seen

'They drove dark nails through me. The scars are seen upon me,'

Bysmeredon	*hīe*	*unc*	*būtū*	*ætgadere.*	*Eall*	*ic*	*wæs*	*mid*	*blōde*	*bestēmed,*
Reviled	they	us	both	together.	All	I	was	with	blood	drenched

'They reviled us both together. I was completely drenched with blood,'

begoten	*of*	*þæs*	*guman*	*sīdan*	*siððan*	*hē*	*hæfde*	*his*	*gāst*	*onsended.*
issued	from	the	man's	side	after	he	had	his	spirit	sent-off.

'which issued from the man's side after he had sent off his spirit.'

All of the prefixes in this text – and in the OE period in general – are of Germanic descent, a state of affairs which differs importantly from PDE, where prefixes are more commonly of Latinate stock. This change is illustrated by the glossing of *by-smeredon* as 're-viled' in the text, the prefix *re-* being descended from OF. Although their semantics have changed slightly, as has the register for their use, the prefixed verbs *besmear* and *beget* are still a part of the English language today, as is the prefix *be-*, overall. This is not the case for *þurh-, ge-, æt-* and *on-*.

In the OE text and translation, *þurh-* exemplifies the tendency to replace prefixation with periphrastic constructions such as phrasal verbs, an alternative which, though

available in OE, rose sharply in frequency during the EME period (cf. Hiltunen 1983). *ge-* shows an alternative that was actually lost (mostly during EModE), that is, the use of prefixes for inflectional purposes. In this case *ge-* marks the participle of the OE verb *seon* 'see', an alternative still available in other Germanic languages (cf. G. *ge-sehen* 'PTCP-see').

The prefixed form *æt-gadere* illustrates the alternation of prefixes in OE. Both *æt-* and *tō-* attached to the verb *gadrian* 'gather' resulting in the identical adverbial semantics 'together'. Evidently, the form with *tō-* replaced the *æt-* form, and was passed down into PDE. Since *tō-* cannot be used with new forms today, it exemplifies the relic preservation (lexicalisation) of unproductive prefixes in PDE.

Finally, the OE prefix *on-*, as in *on-sendan* 'send off, dispatch', represents the numerous prefixes that have been lost in the language. In this case, as in those of OE *ǣt-* and *of-*, a maximally reduced form is preserved, such as the cases of the adverbial form *a-*, in PDE words such as *agape* or *adrift* (< OE *on-*).

The changes in the domain of prefixation since the earliest English can therefore be summarised as: (a) semantic change; (b) replacement through borrowing from Romance; (c) replacement through periphrasis; (d) alternation and substitution; (e) lexicalisation; (f) reduction; and (g) loss.

The case of *be-* in the text shows that some prefixes managed to survive beyond the OE period and are predominantly unchanged even today (cf. *un-, mis-, over-, under-* and *fore-*). It is, therefore, valid to enquire into the linguistic factors that conditioned the different paths of development of native prefixes. Chapter 7 (an extended version of Molineaux 2012) attempts precisely this kind of enquiry, specifically with regards to EME, the period of most radical change in the prefixal system.

In particular, we are concerned with the relation between prefixation and prosody as regards the changes in native prefixation that occurred during the transition from

EOE and LME. In other words, as in the case of Chapter 5 for Mapudungun, this is a study of diachronic morphoprosody. In this case, however, we focus on the changes in affixes attached to the 'strong' left edge of OE words, as opposed to the 'strong' right edge of Mapudungun ones. This structural position is relevant for OE considering the tendency for early Germanic languages to stress the first syllable of words (§6.1.3), a generalisation that was complicated by interaction with stressed and unstressed prefixes. Ultimately, it will be argued that Germanic stress and weight constraints triggered the restructuring of the prefixal system during EME. These changes were not restricted by the word category of attachment, nor by the stressability of prefixes, but should be viewed as more general clash-avoidance mechanisms resulting from processes of foot-optimisation.

Chapter 7

Prefixation, Foot-structure and Change: *Early English*

7.1 Introduction and background

During the period spanning the English of King Alfred (late ninth century – EOE) and that of Geoffrey Chaucer (late fourteenth century – LME) the majority of Germanic prefixes fell out of use. It was, nevertheless, neither the end of all native prefixes, nor the demise of prefixation as a word-formation strategy throughout the language. A number of highly productive prefixes were ultimately lost and either replaced by simplex borrowings (see Table 7.1, a), or by other available resources, such as periphrasis (b). However, several Germanic prefixes remained productive into PDE (c), while others were replaced by new prefixes of Romance descent (d).

Accounts of the loss of native prefixes have been proposed for all core domains of linguistics: semantics (Samuels 1972; Brinton 1989; Kastovsky 1992), syntax (Hiltunen 1983; van Kemenade & Los 2003; Elenbaas 2007) and phonology (Lutz 1997), as well as for Grammaticalisation Theory (Hopper & Traugott 2003; van Kemenade & Los

Table 7.1: Prefixes, lost and preserved

	OE		ME		PDE
a.	*tō-cyman*	'arrive'	*tō-comen* ∼ *arīven*	'arrive'	*arrive*
	and-weard	'present'	*prēsente*	'present'	*present*
b.	*þurh-drīfan*	'pierce'	*driven thurgh*	'pierce'	*drive through*
	ful-neah	'almost'	*full neigh* (rare)	'almost'	*nearly in full*
c.	*ofersion*	'look over'	*over-sēn*	'survey'	*oversee*
	fore-hēafod	'forehead'	*fōr-hēd*	'forehead'	*forehead*
d.	*ed-nīwan*	'renew'	*re-neuen*	'renew'	*renew*
	or-wirþu	'dishonour'	*dishonour*	'dishonour'	*dishonor*

2003). Thus far, however, all such accounts have been restricted to the loss of verbal prefixes, failing to explain the simultaneous decay of nominal and adjectival prefixes.

It is this chapter's intention to provide a principled explanation of prefix loss and preservation across word categories. To do this, we will first review the literature on the history of English prefixation (7.3), and then assess the true extent of prefix loss between OE and ME using corpus data (7.4). This done, we will propose syllable weight, foot structure and the ability to constitute independent prosodic words to be crucial factors determining prefix preservation and loss (7.5). We will finally argue for the growth of a constraint which banned heavy monosyllabic prefixes in EME. Constituting canonical feet and prosodic words, such prefixes would have borne stress, which clashed with adjacent root-initial stress, thus explaining their loss or lexicalisation, and the preservation of light monosyllables and disyllables (7.6).

7.1.1 The origins of Old English prefixes

Accounts by Kuryłowicz (1964) and Hopper (1975) track the origin of verbal prefixes back to IE preverbs, which in turn are derived from adverbs working as secondary predicates (van Kemenade & Los 2003). In the case of nominal prefixes, their origins

are traced back to IE adjectival elements, which gradually lost functional independence, as well as to prepositional variants of IE adverbials. Both in the nominal and verbal forms, the transition from full lexical word to affix has been described as a canonical case of grammaticalisation. The following cline is given for verbal elements (Booij & van Kemenade 2003: 4):

(7.1) Grammaticalization cline for pre-verbal elements

independent preverb > left member of verbal compound > prefix (> zero)

A fundamental sub-process in the evolution of preverbal elements in IE languages is their 'functional bifurcation' (Kuryłowicz 1964: 171). Two morphosyntactically distinct reflexes of the same adverbial evolved and coexisted in a number of attested IE languages: one took the form of an aspectual/intensifying affix and the other, that of a separable, adverbial particle. Several IE languages, including Germanic languages such as present day Dutch and German and OE (but not PDE), preserve a bound, phonologically and semantically weaker form of the original adverb (i.e. a verbal prefix), alongside a stronger, syntactically independent form of the same adverbial (i.e. a separable verbal prefix). Examples of this alternation in an early IE language (Vedic Sanskrit) are given in 7.2, below.

(7.2) Inseparable and separable verbal prefixes in Sanskrit (Hopper 1975: 40):

a. *tam* *cid* *eva* *api* *gacchatāt*
those EMPH thus unto go
'those two shall join them'

b. *apa* *tye* *tāyave* *yathā* *naksatra* *yanti*
away those thieves as stars go
'away those stars like robbers go'

Note that for Vedic, the preverb appears both in the immediately preverbal position (7.2a), and in so called *tmesis* (7.2b), separated from the verb by intervening material. We also find that preverbs appear in stressed and unstressed positions depending on

the nature of the clause (main or subordinate), which has been cited as evidence for varying degrees of 'univerbation' of the preverb-verb complex (Kuryłowicz 1964).

(7.3) Stress and clause type in Sanskrit preverbs (Hopper 1975: 41):

a. *prá* *gacchati*
forth goes
'he goes forth'

b. *yáḥ* *pra* *gácchati*
who forth goes
'who goes forth'

In Vedic, the subordinate clause (7.3b) shows the preverb to be prosodically dependent upon the verb, thus being closer to a prefix than when it appears in the main clause (7.3a). According to Elenbaas (2007: 107-8), OE shows this same contrast. The separable verbal prefixes surface as stressed elements both in immediately preverbal position and in tmesis, while the prefixal elements are unstressed and surface only in the immediately preverbal position. Examples of aspectual/intensifying prefixes (a) and adverbial particles (b-c) are given in 7.4 for OE.[1]

(7.4) Prefix/Particle alternation in OE (data from Elenbaas 2007: 119, 135, 142):

a. *ac* *þa* *Iudei* *of-slogon* *sume* *of* *þam* *witegum,*
but the Jews off-slay some of the wise men
'but the Jews killed some of the wise men' (coaelhom, ÆHom 3:115.479)

b. *&* *his* *heafod* *of* *asloh*
and his head off smote
'and cleaved his head off' (cobede, Bede 1:7.40.7.331)

c. *&* *cearf* *of* *heora* *handa* *&* *heora* *nosa.*
and cut off their hands and their noses
'and cut off their hands and noses' (cochronE, ChronE [Plummer]:1014.24.1903)

[1]The crucial test is given by the question: 'What is off?' In the case of 7.4a, the answer is: nothing. In 7.4b and 7.4c the answers are 'his head' and 'their hands and ears', respectively.

Note that the OE adverbial particles can appear both in the immediate preverbal position (b) or following the verb (c). Whey pre-verbal, they may be said to be prefixed, and follow Germanic word-initial stress. When post-verbal, the particles must be stressed independently. The bound morpheme (a), on the other hand, lacks stress, which falls on the root-initial syllable. This difference has led researchers (in particular Lass 1994: 92-93) to liken separable prefixed verbs to compounds, while inseparable forms are widely considered affixal.

In the case of nominal prefixes, stress is quite consistent, which Hogg (1992b: 45-46) suggests is a reflex of their being bound to the root at an earlier stage than verbal prefixes (see also Campbell 1959: §73). This means that OE inherited a series of prefixes that alternated stress based on the word class of the root (cf. *ǽfþanca* 'offence$_{N}$' *ofþýncan* 'displease$_{V}$').

7.2 Categorisation of Early English prefixes

7.2.1 Old English prefix types

> We have reached the boundaries where the kingdoms
> of the preposition, the adverb, the separable prefix,
> and the inseparable prefix, meet and melt into one another
> B. Mitchell (1978: 256)

One of the problematic issues in the synchronic study of OE prefixes, as pointed out by Bruce Mitchell (1978), is the fact that word class, morphological and prosodic criteria do not appear to line up to create clear-cut categories.

7.2.2 Stress assignment, word category and separability

The traditional view of OE prefixation claims that nominal/adjectival prefixes were uniformly stressed and inseparable, while verbal/adverbial prefixes could either be unstressed and inseparable, or stressed and separable. The evidence from verse, however, shows a slightly different pattern. Although the majority of OE prefixes are stressed based on a morphological rule, some prefixes never bore stress (*be-, ge-, for-*) while others always did (*ánd-, éd-*), regardless of the word category they attached to (Kastovsky 1992: 328, Minkova 2003: 27, 2008: 23-24). Furthermore, in the case of *un-*, which attaches mostly to adjectives, stress alternates unpredictably across a single word category (Minkova 2003: 27, Kendall 1981: §6.3.3).

Table 7.2: Stress patterns of OE prefixes (from Minkova 2008: 25)

Insensitive to base-type		Morphologically sensitive	
Unstressed	Stressed	Verb, Adverb	Noun, Adjective
ge-, be-, for-	*and-, ed-*	*æt-, geond-, ful-, in-, mis-, of-, ofer-, on-, or-, oþ-, þurh-, tō-, under-, wiþ-, ymb(e)-*	*ā-, æf-/of-, æt-, bī-, ful-, in(n)-, mis-, ofer-, on-, or-, sam-, þurh-, under-, ūþ-, wiþ-, ymb(e)-*

Note that in the table, there are several canonically separable OE verbal prefixes that Minkova takes to be morphologically sensitive (*under-, ofer-, wiþ-* and *þurh-*), that is, lacking stress in immediately preverbal position. The evidence for adverbial/prepositional forms immediately preceding a verb, but not alliterating (i.e. not bearing stress) is given in 7.5, following Minkova (2008: 24) .

(7.5) Non-alliterating adverbial elements preceding the verb:

a. *helle underhnige, / heofonas oferstīge* (Riddle 66.611)
hell under-sink heavens over-rise
'sink under hell, rise above the heavens'

b. *wiðstod stronglice. / Næs seo stund latu* (Glc B 903)
resisted powerfully was.not the moment delay

'resisted powerfully. (he) did not delay a moment'

c. *þurhdrifan hi me mid deorcan næglum* (Dream, 46a)
through-drove they me with dark nails
'they drove dark nails through me'

A possible interpretation of the variability of stress on separable prefixes is that in some prefix-root combinations, the prefix is further grammaticalised, and hence prosodically dependent on the root, while others are more genuinely independent. Thus, cases such as those in 7.5 may bear secondary stress, rather than primary stress when more closely bound to the root (cf. §7.5.1.2, p. 372).

7.2.3 Semantics, stress and separability

A view of the semantics of prefixes seems to point to a correspondence between independence and separability (cf. van Kemenade & Los 2003: 138, Elenbaas 2007: 138). Prefixes with aspectual (*be-, ge-*) or emphatic meaning (*and-, for-, ed-*) tend to be bound, while prefixes with more independent, directional meanings (*under- ofer- wiðer-,fore-, ymb-*) tend to be separable. This lines up with the idea that, diachronically, post-verbal particles take over the directional meanings of OE verbal prefixes (Hiltunen 1983; Elenbaas 2007).

Prefixes' semantic dependency, however, does not seem to mirror stress assignment. The stressed, bound verbal forms (*ánd-, éd-*) show that bearing stress does not imply separability, just as the examples in 7.5 show lack of stress not to imply semantic dependence. A gradient view of semantic independence is given in Figure7.1.

Figure 7.1: Semantic independence (from Minkova, 2008: 30)

be-, ge-, for-, of-, on-, tō-, and-, ed-, mis-, -un .... geond-, ofer-, þurh-, wiðer-, ymb-

least independent — most independent

7.2.4 Middle English prefix types

The vast majority of OE prefixes were no longer productive by the time of the composition of canonical LME texts (cf. Baugh 1935; Marchand 1969; Burnley 1992). This said, there are still a few very productive cases of Germanic prefixes in ME, notably the erstwhile inseparable forms *un-, for-, mys-, be-* and *ge-* (reduced to *y-* or *i-*), as well as *a-*, a reduced form of OE *on-*, *of-* and *an-* (Marchand 1969: 92). Some adverbial, separable OE forms remain in ME as well, such as *under-* and *over-* which are no longer separable in preverbal position.

The remainder of ME prefixes are Latinate forms borrowed into the language in the centuries following the Norman Conquest, either from NF, or directly from Latin, not so much as direct borrowing of the morphology, but as reanalysis of borrowed complex forms. A summary of these forms is given in Table 7.3, based on the data from (Marchand 1969).

Table 7.3: ME prefixes by origin

Germanic	Latinate
un-, mys-, be-, for, y-(i-), a-, under-, over-, fore-	*re-, in/im-, dis-, en-/em-, mal-, sub-, super-, pre-, inter-*

For the most part, the OE stress pattern remained in native ME prefixes, which meant that verbal forms of *mys-, under-, over-,* and *fore-* bore primary stress, while all other forms were unstressed. The reduced prefix *a-* no longer bore stress, as is the case for verbal *un-* (cf. §7.6.3). In addition, the incoming Latinate prefixes tended to be unstressed if they were monosyllabic, though they could be promoted to stress in verse (Minkova 2003: 55). The disyllabic Latinate forms are likely to have borne secondary stress in verbs and primary stress in nouns, since they were canonical OE feet (Marchand 1969: 123, and §7.5.1.3).

In terms of their semantics, much of the directional meaning of OE prefixes was

taken over by phrasal verbs and the incoming Latinate forms (*circum-, sub-, pre-, inter-*), with only some of the clearly adverbial forms remaining (*under-, over-*). As for verbal prefixes' aspectual and intensifying meanings, these were also eventually weakened and lost, with concomitant growth of the idiomatic and aspectual meaning of phrasal verbs (cf. PDE *eat up*; *work away*). As Marchand claims: 'The final result was that English lost a prefixal device for expressing the idea of intensity and perfectivity with verbs' (1969: 86).

The only native prefixes that seemed to grow in their semantic possibilities were the negative prefixes *un-* and *mys-*. While *un-* took on some of the meanings of *and-* and *on-*, particularly the reversative meaning for verbs (*undo, unbind*, cf. Burnley 1992), *mys-* became stronger due to its merger with NF *mes-* (cf. OF *mesconter* 'miscount'> ME *myscounten* 'miscount' – see §7.6.3).

7.3 Previous accounts of prefix loss

7.3.1 Contact-based arguments for prefix loss

A traditional notion in the literature claims there is a causal link between the Norman Conquest and the waning of OE prefixes. 'Widespread use of prefixation in OE' (Kastovsky 1992: 378) would have been upset by a large influx of new vocabulary providing lexical alternatives to the native word-formation system (Baugh 1935; Marchand 1969; Samuels 1972). Although Baugh does mention that, before their replacement, prefixes had already mysteriously lost much of their 'vitality' (1935: 224), he goes on to state that: 'the wealth of easily acquired new words had weakened English habits of word-formation' (*ibid:* 225). This is echoed by Marchand's assertion that 'the language took to wholesale borrowing, a method which meant an enormous cut-down on the traditional patterns of word-formation' (1969: 131).

Although much of the functional load of lost prefixed words was, no doubt, taken over by simplex or complex non-native vocabulary, the 'loss of vitality' of OE prefixes cannot be explained by the subsequent repair strategy of borrowing. Furthermore, the 'wholesale borrowing' approach gives no reason for the loss of some prefixes and the preservation of others, nor does it explain the productivity of both native and borrowed prefixes throughout the period.

The chronology of this argument is also debatable. Baugh claims that the loss of native prefixes occurs 'at a time when French borrowings have reached their maximum' (Baugh 1935: 225). However, detailed studies of prefix loss (such as Hiltunen 1983, for verbal forms) place the decay of OE prefixes beginning at least as early as the tenth century and reaching a peak around the mid-twelfth century, which contrasts with peaks in frequency of French vocabulary influx in ME texts, which have alternatively been placed in the fourteenth and fifteenth centuries (see Dekeyser 1986 for a review). Furthermore, while it is true that a number of non-native prefixes entered the language during the ME period (*dis-, re-, in-*, etc.), this takes place mostly later (c.1370-1570) than the period of greatest native prefix loss, which spans LOE and EME (c.950-1250) (cf. Hiltunen 1983; Kastovsky 1992; Lutz 1997).

A different view of the influence of language contact upon prefix loss centres on the close contact of English with Scandinavian languages, especially in areas of the North-East. The relevance of this contact for the purposes of understanding prefix loss is that ON had by this point already lost most verbal prefixes and relied heavily on periphrastic forms such as postverbal particles or prepositions to express both directional and aspectual meanings (Wessén 1958). The contact of the two closely related languages, it is claimed, would have led to 'structural assimilation' which included the loss of OE prefixes on the basis of the Scandinavian model (Samuels 1972: 163-4, Fischer 1992: 386, Elenbaas 2007: 170-9).

Again, although this argument has strong appeal, it provides no principled reason why some prefixes should be lost and others preserved. It is especially problematic for nominal prefixes, which were mostly preserved in ON (Wessén 1958), but very often lost in EME. The case of verbal *be-* is also problematic, since it was lost early in pre-ON (cf. Wetterlin et al. 2007: 354), only to be re-borrowed in medieval times, after the period of the language's coexistence with English under the Danelaw. Based on these facts, *be-* would be expected to disappear from EME, mirroring the ON structure, a prediction that is clearly not borne out.

7.3.2 Semantic accounts of prefix loss

The main argument explaining prefix loss in the literature is a semantic one. It underlies the notion of 'loss of vitality' and is explicitly dealt with in accounts of the rise of the phrasal verb (Samuels 1972; De la Cruz 1975; Hiltunen 1983; Elenbaas 2007) and the development of aspectual systems in English (Brinton 1989; Ogura 1995). The position is summarised by Kastovsky (1992: 337):

> '[T]he system of OE prefixes, in particular those occurring with verbs, was already at the end of the tenth century in a state of advanced decay, because many prefix-verb combinations were no longer transparent... in subsequent copies of one and the same text prefixes are often omitted, added or exchanged for other prefixes without any apparent semantic effect.'

In a close examination of parallel manuscripts of OE texts, translations and glosses, Ogura (1995) finds widespread alternation of verbal prefixes with the same stem, which she considers to be the result of a certain semantic ambiguity, a conclusion also reached by De la Cruz (1975) and Hiltunen (1983) before her. Although the alternation is not completely unconstrained (specific prefixes tend to alternate with each other or with specific lexemes), Ogura (*ibid.*) finds that the vast majority of prefixes do alternate to

some extent, producing confusion, especially among those prefixes that lack adverbial counterparts (i.e. inseparable prefixes). It is this lack of semantic definition which would have ultimately led to the prefixes' abandonment.

For Hiltunen (1983, based on De la Cruz 1975), the semantic and functional weakening of bound prefixes would be the result of the overlap of their varying degrees of spatial, perfective and intensive meaning. In this sense, the growth of the separate particle would have surfaced as a 'more explicit means' (Hiltunen 1983: 96) of expressing the spatial element. The claim that the semantics of the prefixal elements were substantially weakened is exemplified by the overlap of prefixes and particles with the same semantics.

(7.6) Doubling of prefixes/particles (from Elenbaas 2007: 146):

a. * þone cyng Dufenal ut adræfde. (ChronE: 1097.40.3296)*
and the king Dufenal out drove
'and expelled king Dufenal'

b. * Aaron ahefde up hys hand, (Exod: 8.17.2642)*
and Aaron raised up his hand
'and Aaron raised up his hand'

Although Hiltunen avoids the association, he points the reader to Samuels' (1972: 164) interpretation of the shift as a 'push/drag chain', where the inconsistent semantics of bound prefixes would have left 'a gap . . . in the system as a whole' which dragged the post-verbal particles to take over spatial (and later perfective and intensive) semantics. The 'push' element, in Samuels' view, would have been contact-induced, that is, the result of following the Scandinavian tendency towards post-verbal particles, as well as the substantial influx o French vocabulary (cf. §7.3.1).

The version of the semantic argument held up by Brinton (1989) sees the rise of phrasal verbs as a result of the weakening of the directional meaning of OE bound verbal prefixes. It is her claim that the main semantics of these prefixes was 'terminative' or

'telic' *aktionsart*, meaning that 'the action tends to a certain goal' (Lindemann, 1970 in Brinton 1989: 205), not as a grammatical characteristic of the manner of the action, but as part of the action's internal structure. In her view, these meanings would be more easily lexicalised or replaced by periphrastic forms.

(7.7) Purported aktionsart of OE prefixes (from Brinton 1989: 205 – searches of BT):

a. *þurh-clǣnsian* 'to clean to the end, completely, thoroughly'

b. *be-windan* 'to wind around' 'to wind to the end, completely'

c. *for-meltan* 'to melt away'

Although the directional semantics of many LOE inseparable prefixes are substantially weakened as compared to separable forms and prepositions, the accounts in this section provide no principled view of loss within both these categories. Furthermore, although the semantics of inseparable verbal prefixes are replaced by the periphrastic alternative, there is no explicit account for nominal prefixes. Hence, the semantic approach requires three different explanations for the simultaneous loss of three very similar structures (separable, inseparable verbal and nominal prefixes).

Finally, some inseparable prefixes manage to survive loss even when weakened (i.e., when they alternate in the texts). Such is the case of ME *a-* and *be-*, which represent the merger of several OE prefixes (cf. entries for both prefixes in the OED), as well as *ge-*, which alternates heavily in OE (Ogura 1995: 73) but survives throughout the ME period. It is concluded, hence, that 'semantic strength' alone cannot be taken to determine the diachronic trajectory of prefixes in English.

7.3.3 Syntactic approaches to prefix loss

The syntactic arguments for prefix loss refer to two basic generalisations: (a) that throughout its recorded history, English has undergone an 'analytic drift', thus prefer-

ring periphrastic constructions to word-formation and inflectional ones (van der Gaaf 1930, De la Cruz 1975: 67, Lutz 1997: 263 fn. 6), and (b) that the shift from OV to VO word order in OE and ME set forth a general tendency to post-specification (Hiltunen 1983; Elenbaas 2007).

Both issues are brought up by van der Gaaf:

> 'The tendency to place the preposition after the verb wherever this was possible is one of the manifestations of the general tendency in Middle English to substitute analytical constructions for synthetic forms. It led to many compound verbs [i.e. prefixed verbs], the first component of which was a preposition or adverb, being replaced by analytical combinations, post-position being assigned to the preposition or adverb.' (1930: 12)

Hiltunen, on the other hand, specifically claims that the decay of inseparable prefixes:

> 'is not to be seen as an isolated process of waning and wearing out, but as part of the changing systems which involve the phrasal and prepositional adverbs, and ultimately the entire syntax of the language – in particular the establishment of the SVO syntax' (1983: 101)

Both Hiltunen (1983) and Elenbaas' (2007) data on the position of particles in OE and ME point towards a reduction in frequency of pre-verbal specifiers, whether morphological or syntactic (i.e. prefixes or particles). However, a major argument against the rise of post-specification is the persistence of inseparable prefixes throughout the period of growth of the phrasal verb (*un-*, *be-*, *mis-*, *ge-*, *a-*), as well as the later productive adoption of Latinate prefixes in the fourteenth and fifteenth centuries. As in the case of semantic decay, here too the arguments are tailored for verbal prefixes. In the case of nouns, rather than working like adverbs, the prefixes are much more like adjectives (*bīfylce* 'neighbouring folk; lit. *by-folk*'; *inhere* 'home army; lit. *in-army*')

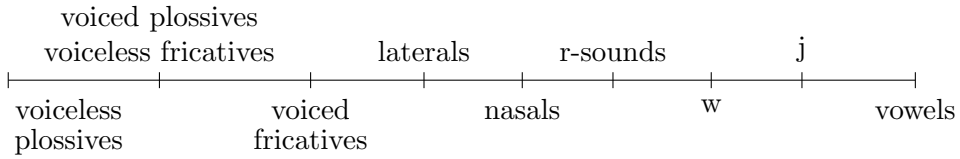
thus remaining consistent with ME and PDE word order.

7.3.4 A phonological account of prefix loss

Although most accounts of prefix loss refer to phonological factors playing a part in the change,[2] the only explicit account of this type is given by Lutz (1997). She maintains that prefix strength derives both from the inherent characteristics of its consonants (7.8), and from their position within stressed/unstressed syllables (7.9), where weaker syllables are more vulnerable to 'phonotactically conditioned change' (7.10).

(7.8) Inherent consonantal strength:

a. Overall:



b. Within fricatives:

(7.9) Positional strength: ('≥' = stronger than)

a. onset ≥ coda b. stressed ≥ unstressed

(7.10) Changes triggered by phonotactic weakness:

a. loss of weak consonant, simplifying the original form of the syllable.

b. replacement of the consonant by a similar but stronger consonant, thus stabilising the syllable.

c. loss and replacement of the entire morphological unit.

[2]Marchand, for instance, claims prefixes were 'almost too weak phonetically' (1969: 130). Samuels tells us 'loss of verbal prefixes was due partly to their lack of stress' (1972: 163).

Since, in Lutz's theory, the positional strength of the consonants is increased by stress, nominal and separable verbal prefixes would be much less vulnerable to reduction or replacement, and hence their loss remains unexplained. The adoption of Latinate prefixes with inherently weak consonants in unstressed syllables such as *mal-* and *re-* is another stumbling block for Lutz's general theory. If the same constraints that allegedly destabilised the OE prefixes were still active at the time when Latinate forms were adopted, then a number of these would have been replaced or reduced, and possibly lost. The subsequent history of the prefixes proves this did not occur.

7.3.5 Grammaticalisation and prefix loss

Hopper and Traugott propose that 'at the extreme end of the history of a particular form as a grammatical marker we may find loss, either of form alone or occasionally of both form and function' (2003: 172). This is precisely what is implied by the final stage of the cline in (7.1). Nevertheless, the processes by which this final state is arrived at are not pre-determined, and, as we shall see for the history of prefixes, the path leading to such loss is not uniform for all items in a category. It is claimed here, along with Joseph (2004: 61), that grammaticalisation is an 'epiphenomenon' of change, that is, the intersection of a series of language change processes, one that is quite common, but not one that can be viewed as a causal force on its own. It is concluded, therefore, that an analysis of native prefix-loss in English cannot be simply the 'result' of grammaticalisation, but that a principled account of the divergent diachronic paths of OE prefixes is called for.

7.4 Corpus data

In this section, we report on a controlled comparison between two stages of English, based on evidence for the productivity of prefixes at each stage. As a result, the data prompts a series of inferences about the diachronic development of native prefixes. Although Hiltunen (1983) and Ogura (1995) have provided accounts of the alternation of verbal prefixes in OE manuscripts, and Hiltunen (1983) and Elenbaas (2007) have explored the frequencies of pre- and post-verbal separable prefixes, there has been no comparative corpus-based look into prefixation at the relevant stages. The emphasis here is on understanding the development of prefixes across word categories and without regard to separability.

7.4.1 Prefixation and productivity

The productivity of a morphological process is defined as 'its potential for repetitive non-creative morphological coinage' (Bauer 2001: 98). In other words, a morphological process is productive if it can be used with words with which it was previously not used, and preserve a specific meaning across them.

The origins of many simplex PDE words can be traced back to prefix-root combinations in OE, showing at least some relic continuity, as in the case of *forbid* < OE *for-beodan* 'hinder, restrain'. Today however, *for-* (meaning 'in opposition') is no longer used in combination with new roots (cf. **for-march*). The necessary conclusion is that the prefix is no longer productive, and that *forbid* has become 'lexicalised': there is no longer a synchronically productive rule for the word's decomposition into meaningful units or for the prefix's use in constructing new complex words (see Bauer 2001: 43-51).

The corpus study that follows, however, does not focus on a measure of degree of productivity, but on the causes behind the absolute loss of productivity of prefixes.

A fair gauge to determine this is the frequency of attestations of the prefix, not only overall, but also with different roots (Bauer 2001: 47-9; Booij 2005: 69-70). We will therefore evaluate two specific synchronic stages in the language, A and B, determining the productive prefixes for stage A, and later ascertaining whether they are still productive in B.

7.4.2 Empirical questions, data and methods

The data belongs to two distinct stages in the history of the language: the early West-Saxon language of the late ninth century, and the London variety of LME spoken towards the end of the fourteenth century. This five-century span affords a look at a stage of OE when native prefixes were still robustly used, and a stage of ME after the major changes in verbal prefix structure had occurred. The study views all morphemes that appear before a major word category, forming a close semantic unit with it, as prefixes.[3]

(7.11) Empirical questions:

a. Which OE prefixes are still productively used in the late ME period, and which ones are lost?

b. Is separability a factor influencing survival of OE prefixes?

c. Is category of prefixed-words a factor influencing survival of OE prefixes?

For the purposes of controlling the corpus' topic and register, the study has been limited to OE and ME translations of a single, relatively large Latin text: Boethius' *De Consolatione Philosophiæ*. The OE version, attributed to King Alfred, is likely to date from the very last years of the ninth century (894–9 is suggested by Godden & Irvine 2009: 145). For ME, we examine Chaucer's translation (known as the *Boece*),

[3]In ambiguous cases, where the string of segments could be interpreted both as prepositional and affixal, we have opted to interpret it as a prefix.

which has been dated to the early 1380's (Benson 2008: xxv).[4] The texts were searched using the *Dictionary of Old English Web Corpus* (DOE 2009) and the *Corpus of Middle English Prose and Verse* (MED 2001). Specific strings of letters used in the attested spellings of the studied prefixes were targeted.

Table 7.4: Prefixes studied in the corpus

Attested OE prefix forms	Attested ME prefix forms
æ-/a- and- æt-/at- be- bī- ed- for- fore- forð-/forþ- ge- in-/inn mid- mis- of- ofer- on- or- oð-/oþtō- þurh-/ðurh- un-/on- under- up-/upp- ut- wið- ymb-	*a- and- be-/bi-/by- for- fore-/for- y-/i- in- mys-/mis- ouer-/over tō- thrugh- un-/vn- under-/vnder up-/vp- ut-/vt wið-/with-*

7.4.3 Results

An overall total of 5,149 tokens were found for the 26 target prefixes. The OE prefixes make up 79% of this total (4,072 tokens), while the ME ones make up only 21% (1,077 tokens). 711 different combinations of specific prefixes and roots (types) were found in the OE *Boethius*, while the ME version had only 260. In the case of both token and type, then, we find a drastic reduction of prefix use, especially, when we consider that the word count of the Chaucerian version is approximately twice that of the Alfredian.

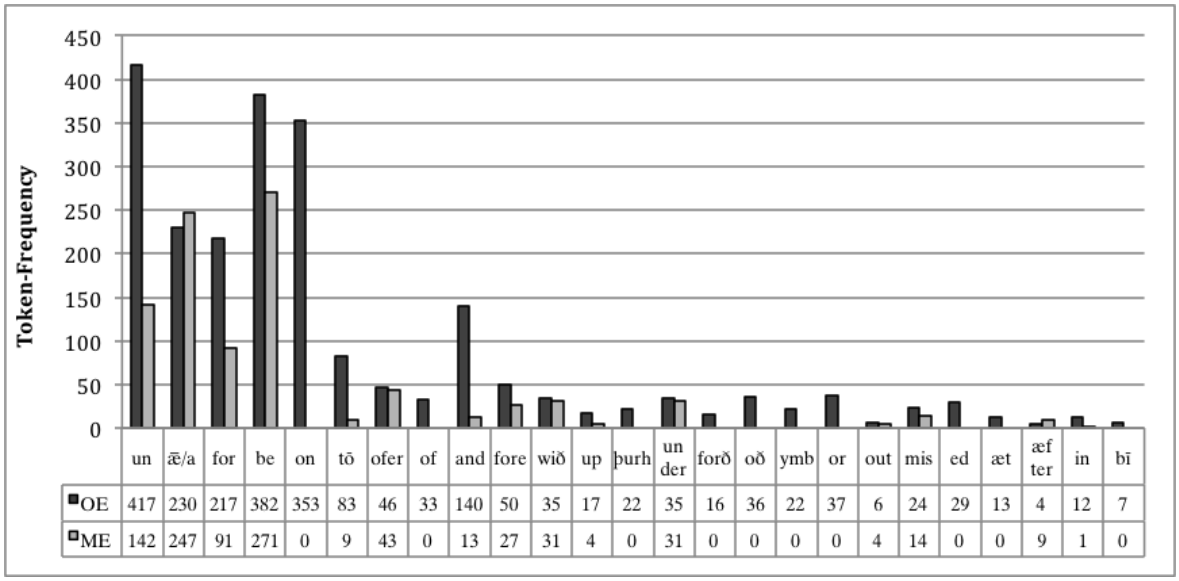
By far the most common prefix in both the OE and ME texts is *ge-* (ME *y-/i-*), making up 38% of the total tokens. In order not to skew the data, this prefix is dealt with separately, after the type and token data are presented for the rest of the prefixes (cf. Appendix D).

7.4.3.1 Token-based results

Tokens, in this case, are individual attestations of the prefixes, regardless of the root they are attached to (Bauer 2001: 47). Although these data provide the number

[4]For more details on the corpora used, see Appendix C.

of prefixes used in the text, they can give an inaccurate view of a prefix's actual productivity, since they may only reflect the prefix use in combination with a small number of roots.



	un	æ/a	for	be	on	tō	ofer	of	and	fore	wið	up	þurh	under	forð	oð	ymb	or	out	mis	ed	æt	æfter	in	bī
OE	417	230	217	382	353	83	46	33	140	50	35	17	22	35	16	36	22	37	6	24	29	13	4	12	7
ME	142	247	91	271	0	9	43	0	13	27	31	4	0	31	0	0	0	0	4	14	0	0	9	1	0

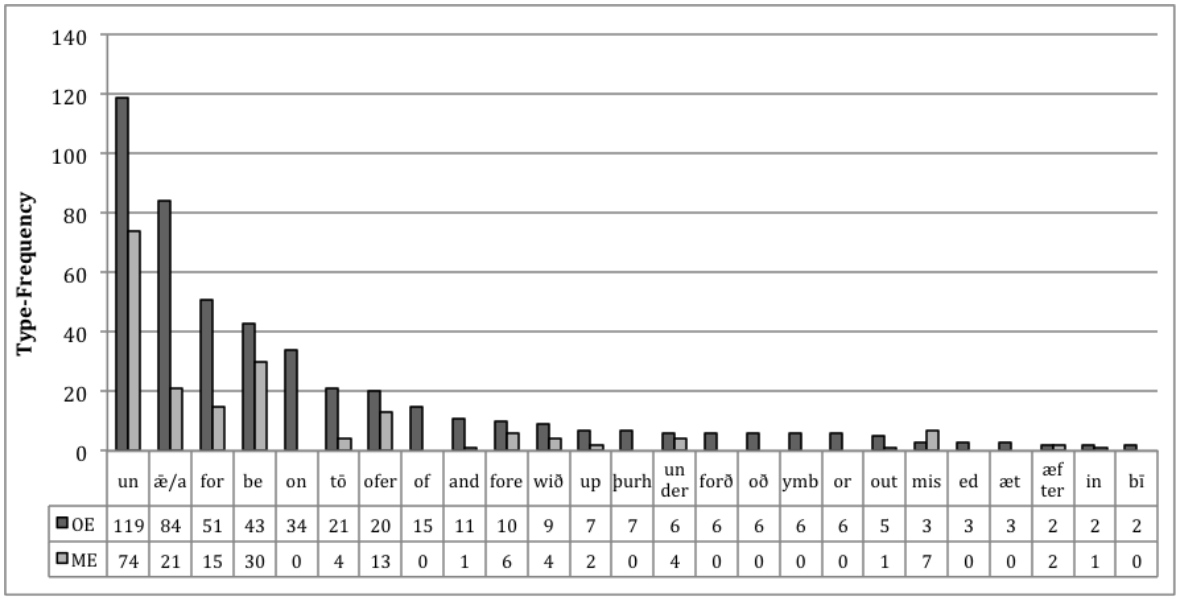
Figure 7.2: **Token-based results** Dark bars represent the total number of OE prefix tokens, by prefix, while lighter ones represent ME prefixes. For consistency, prefixes are ordered according to the type frequencies for OE (cf. 7.4.3.2).

7.4.3.2 Type-based results

Type results refer to the number of different roots that are attached to a particular prefix. In this sense, they are a reflection of the diversity of the roots the prefix attaches to and hence a more reliable indicator of productivity (Bauer 2001: 153-159).

We are now able to compare the overall numbers of OE and ME prefix-root combinations and provide a percentage of OE prefix types still present in ME.[5]

[5]Since the ME version of the text includes a prose translation of the Latin *Metra* (the versified form of the *Consolatio*), a more exact percentage for the preserved prefixes would be roughly half of what is given. This asymmetry, we believe, only accentuates these results by providing additional contexts for the use of the prefixes in the ME text, a condition that is equally provided for all prefixes. The percentages given in the rightmost column do not represent the presence of exact reflexes of the OE forms in ME, but a percentage of overall numbers.



	un	æ/a	for	be	on	tō	ofer	of	and	fore	wið	up	þurh	under	forð	oð	ymb	or	out	mis	ed	æt	æfter	in	bī
OE	119	84	51	43	34	21	20	15	11	10	9	7	7	6	6	6	6	6	5	3	3	3	2	2	2
ME	74	21	15	30	0	4	13	0	1	6	4	2	0	4	0	0	0	0	1	7	0	0	2	1	0

Figure 7.3: **Type-based results** Dark bars represent the number of different OE roots each prefix attaches to, while lighter ones represent the same number for ME prefixes. Prefixes are in descending order according to the type frequencies in OE.

7.4.3.3 Results for inflectional *ge-*

By the ME period, *ge-* functions mostly as a marker of the participle (cf. Stanley 1983), as can be seen in the corpus data, where the only exception is *ynough* 'enough'.

As is evident from figures 7.4 and 7.5, the number of tokens of the prefix is radically reduced in the ME corpus as compared to the OE corpus (8%). The reduction of types, however, is not as radical (33%). Furthermore, in the case of both type and token, the ME numbers are just as high as those of the most frequent ME prefixes in the previous section.

Table 7.5: Percentage of OE types in ME

Prefix	OE type	ME type	% of OE prefix-types in ME
un	119	74	62
ǣ/a	84	21	25
for	51	15	39
be	43	30	70
on	34	0	0
tō	21	4	19
ofer	20	13	65
of	15	0	0
and	11	1	9
fore	10	6	60
wið	9	4	22
up	7	2	29
þurh	7	0	0
under	6	4	67
forð	6	0	0
oð	6	0	0
ymb	6	0	0
or	6	0	0
out	5	1	20
mis	3	7	233
ed	3	0	0
æt	3	0	0
æfter	2	2	100
in	2	1	50
bī	2	0	0
Total	481	185	38

7.4.4 Discussion

7.4.4.1 Preserved prefixes

The prefixes *un-, a-, for-, be-, under-, ofer-, mis-, fore-* On purely numerical grounds, we can conclude that these prefixes are well preserved into the ME period, since they are all either attested with 15 or more types in Chaucer's translation, or

Figure 7.4: Token-based results for *ge-*. Bars represent the total number of attestations for *ge-* in each text, the darker for OE, the lighter for ME.

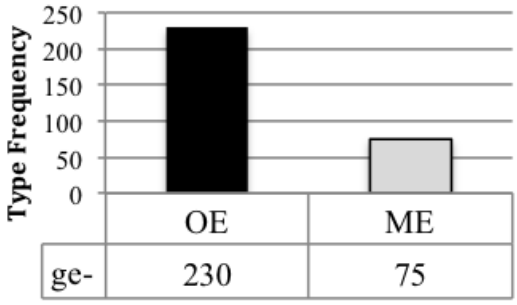


Figure 7.5: Type-based results for *ge-*. Bars represent the number of different roots *ge-* attaches to in each text, the darker for OE and the lighter for ME.

with 50% or more of the OE types in the ME text, along with at least five types preserved. It must be mentioned, however, that the etymology of ME *a*-prefixed words shows them to originate not only in OE *a-*, but also in *of-* and *on-*. Although the meaning of the prefixes preserved in ME may have been rather unclear, the number of attestations in the *Boece* seems to indicate that they were still productively attached to a large number of roots.

In the case of orthographic *for-*, its semantics and etymology in ME alternate between OE *for-* 'against' and *fore-* 'in front of, before'. Five out of the twenty types can

be traced back to the disyllabic prefix,[6] while the rest can be traced back to OE uniformly unstressed monosyllabic *for-*. Importantly, all the types involving monosyllabic *for-* that are preserved in ME are attested in OE as well. Adding no new roots, it is hard to say whether the prefix is truly productive, however, the number of prefixed words is still high enough in ME to make a case for its preservation.

Even though *fore-* only surfaces once in the *Boece* with the final vowel, we assume that the full disyllabic form must have survived through EME, after which the final vowel was lost. We note also that ME *forknowen* 'foreknowledge' is not attested as a compound in any of the OE sources consulted, though clearly decomposable into etymological *fore-*, and the root *knowen* (< OE *cnāwan*), which argues for productivity of ME *for-* with the meaning of OE *fore-*.

The prefix *ge-* Although it is reduced both phonologically and in its frequency and distribution in ME, *ge-* is still the most common prefix in the data. It also attaches to non-native roots (cf. *y-pruved* 'PTCP-prove'; *y-governed* 'PTCP-govern'), and should hence be considered productive.

7.4.4.2 Lost prefixes

The prefixes *oð-, or-, ed-, þurh-, ymb-, æt-, bī-, on-, forð- and of-* It is assumed here that all forms with zero attestations in ME have been lost. This is the case for *oð-, or-, ed-, þurh-, ymb-, æt-,* and *bī-*. The prefixes *on-* and *of-*, which survived in forms reduced to *a-*, are also considered lost as independent forms.

[6] ME *for*-prefixed words traceable to disyllabic (*fore-*) in OE:

a. *forhede*	'forehead'	<	OE	*forehēafod*	'forehead'
b. *foreside*	'aforesaid'	<	OE	*foresecgan*	'already mentioned'
c. *forward*	'agreement'	<	OE	*foreward*	'agreement'
d. *forwyter*	'soothsayer'	<	OE	*forewitan*	'to foreknow'
e. *forknowen*	'foreknowledge'	<	OE	*fore-; cnāwan*	'before'; 'know'

The prefixes *tō-, and-, out-, up-, in-/inn-, wið-* ME forms with *tō-* are considered not to be truly productive, remaining as relic forms. Evidence for this is given by the fact that two of the erstwhile prefixed forms are still present in PDE: the adverbial *tōgeder* 'together' and *tōward* 'towards'. In these cases, the high frequency of the adverbials in general usage, may have led to loss of morphological structure at an early stage (cf. Aronoff 1983: 168).

The *and-* prefix appears with only one root in the ME corpus: verbal *answēren* and nominal *answēre*. The same relic has survived into PDE as undecomposable *answer*. A single (both nominal and adjectival) attestation is found for ME *out-*: *outcaste* 'outcast, abject', where the prefix is likely to be just a relic. The verbal forms of OE *out* appear in ME only in the post-verbal position.

There are only two attested types of the prefix *up-* in the ME text, making up less than 30% of the overall types. The forms are *upryght* 'upright' and *uphepynge* 'abundance'. The former is likely a lexicalised item, as it still is today, and the latter may well have been lexicalised and later lost. The single case of the prefix *in-* for ME, seems to be a relic form (*inset* 'implanted'), since it is unlikely that it would have survived productively side by side with Latinate *en/in-*.

Of the four *with*-prefixed words preserved into ME, three – *withholden, withdrawen* and *withstanden* (with 9, 9 and 11 tokens, respectively) – are also preserved into PDE as non-compositional relics, *withhold, withdraw* and *withstand*. Their relatively high token frequency is likely to correspond to a greater degree of lexicalisation (Aronoff 1983: 168).[7]

[7]Note that we cannot claim *with*-prefixed forms to be purely indecomposable, as they do follow irregular inflectional patterns: cf. *withdraw withdrawn withdrew, withstand withstood; withhold withheld*. We can claim, however, that the form is not productive.

7.4.5 Corpus-data conclusions

Our quantitative and qualitative analysis allows for the following classification of prefixes:

Table 7.6: Lost and preserved OE prefixes in ME

Native Prefixes Preserved in ME	Native Prefixes Lost in ME
mis-, un-, for-, be-, a-, ofer-, under-, fore-	*on-, and-, tō-, in-, out-, or-, ed-, æt-, ymb-, of-, up-, þurh-, bī-, wið-*

These data constitute an answer to the first of the three empirical questions (7.11a). To address the next two questions, we shall ask whether separability or word-category membership are related to prefix loss and preservation.

Inseparability of prefixes cannot guide loss or preservation, since canonically inseparable prefixes such as *ed-*, *and-*, *ǣ-*, *or-*, *ge-*, *un-*, *mis-*, and *be-* were in some cases lost, and in others preserved. Furthermore, typically separable verbal prefixes such as *under-*, *ofer-*, *wið-*, *forð-*, *up-*, and *ūt-* also went in both directions. In other words, since separable and inseparable prefixes do not pattern with any particular diachronic trajectory, we consider such morphosyntactic factors not to influence prefix survival.

The same is true for canonically nominal and verbal prefixes. Both purely nominal/adverbial prefixes (*or-*, *bī-*, *ǣ-*, *uð-*, *æf-*) and predominantly verbal/adverbial prefixes (*on-*, *of-*, *at-*, *oð-*) are lost. Moreover, in the case of prefixes that can attach to both nominal and verbal roots in OE, there is no tendency for verbal forms to be preserved over nominal ones, or vice-versa.

7.5 A prosodic approach to changes in prefixation

If we momentarily exclude *for-*, *mis-* and *un-*, a look at the prefixes that were lost and preserved during the ME period – according to our corpus study – shows a correlation

between survival and syllable weight.

Table 7.7: Lost and preserved prefixes by weight and number of syllables

	Heavy	Light	Disyllabic
Lost	*on-, and-, tō-, in-, out-, or-, ed-, of-, up-, þurh- wið-, ǣ-, æt-, bī-*		
Preserved	*mis-, un- for-*	*ge-, be-, a-*	*ofer-, under-, fore-*

It is hypothesised here that, in the absence of other factors providing a uniform explanation for prefix loss and preservation across categories, phonological factors – in this case, weight distinctions – must play a role. Since heavy syllables are not lost across the board in EME, it is further contended that the loss of heavy monosyllabic prefixes is specific to their position immediately preceding the root. This interaction between syllable weight and a morpho-phonological position (the left edge of a word) can be characterised as prosodic. Controversially, the corpus evidence shows that it is not the 'weaker', light, unstressable prefixes that were lost in the transition to ME, but the 'stronger', heavy, stressable monosyllabic prefixes. This can only be explained if we consider disyllables and light monosyllables to remain compatible with EME roots, while their weight made heavy prefixes progressively incompatible.

It will be argued that language-internal factors such as the growing preference for branching feet in ME, and contact factors such as the borrowing of countertonically stressed words, led the language to avoid stress clash between adjacent syllables within the prosodic word. As a result, heavy monosyllabic prefixes – which tended to bear primary stress in nouns and secondary stress in verbs – were disprefered due to clash with root-initial stress.

7.5.1 OE and ME word-prosodic structure

7.5.1.1 Minimal weight

Syllable weight distinctions occupy an important place in the prosodic makeup of Germanic languages (Prokosch 1939, Campbell 1959: 39; van Coetsem 1996; van der Hulst 1999a). In OE and ME this is evidenced through minimal wordhood constraints. All major word categories appear to allow monosyllables, but only on the condition that they have a long vowel and/or a coda consonant.

(7.12) Restrictions on monosyllables in OE and ME:

a. OE *wā* 'woe' ME *sē* 'sea, ocean'

b. OE *wan* 'dark' ME *hath* 'have 3S'

The same syllabic conditions, however, do not apply to disyllables, where two light syllables may constitute a lexical word.

(7.13) Words with two light syllables in OE and ME:

a. OE *scipu* 'ship-NOM.P' ME *wone* 'usage, custom'

Clearly, the distribution of syllables in OE and ME minimal words is amenable to a moraic analysis: the minimal word is made up of two moras (see Minkova 2008: 32).

7.5.1.2 Stress in Old and Middle English

Old English stress Primary stress in OE is relatively straightforward. It follows the general 'left strong' Germanic tendency by falling on the first syllable of the root (Halle & Keyser 1971: 90, Hogg 1992b: 47, Minkova 2006: 95). In the case of compounds, main stress is assigned to the leftmost morpheme (*córnhūs* 'granary'; *góldhroden* 'adorned with gold'), very much as in PDE (*píckpocket*; *flówerpot*). In the case of prefixed words, nominal and adjectival prefixes consistently take primary stress (with the exception of *be-, ge-* and *for-*), inseparable verbal and adverbial prefixes are

unstressed (with the exception of *ed-* and *and-*) and separable verbal prefixes tend to take primary stress (but see Minkova 2008: 32).

Based on the evidence from alliteration, and from the position of the rises in metre (Sievers 1893; Minkova 2003), there is general agreement that secondary stress in OE falls on the second element of compounds (e.g. *gámofèax*, 'grey-haired') or on bound suffixes that can be traced back to independent morphemes (*éorl-scìpe* 'manliness'; *cýne-dòm* 'dominion'). Crucially, this holds regardless of the number of syllables of the roots involved (*blódrèad* 'blood-red'; *kýnegòd* 'noble'). In the case of prefixed nouns and adjectives (as well as separable verbal prefixes), root-stress is claimed not to be lost, but simply to remain at a lower level of prominence compared to the prefix (*ánd-sàca* 'apostate'; *ín-cŭð* 'strange', see Hogg 1992b: 48, Minkova 2008: 46 fn. 41).

Finally, there is evidence for secondary stress in inflected words of three or more syllables (see Sievers 1893). The environment for secondary stress is defined by Campbell as 'any long final syllable [H], after another long syllable or its equivalent [LX] ... when it becomes internal due to the addition of an inflection' (1959: 34-5). Hence we find the following alternations (from Lahiri & Fikkert 1999: 246-247).

(7.14) Secondary stress in OE:

a. *hǽrìngas* 'herring-NOM.P' b. *ǽþelìnges* 'prince-GEN.S'

c. *hǽring* 'herring-NOM.S' d. *ǽþeling* 'princeNOM.S'

Again, weight surfaces as a fundamental factor in OE stress assignment.

Middle English stress Halle & Keyser (1971: 101) argue that ME had a hybrid stress assignment system, where native words were stressed from left to right without regard to quantity, as in OE, and Romance loans were assigned stress from right to left on the first heavy syllable. However, although there are a number of cases where primary stress falls on a syllable that is not initial, most words lacked heavy syllables at the right edge, hence the vast majority of ME loans would have been stressed identically

whether stress was assigned starting at the left or the right edge (Dresher & Lahiri 2003: 76-77). Moreover, alleged end-stressed words tend to show alternation to fit the metre, particularly in the Chaucerian canon, producing a series of doublets (from Dresher & Lahiri 2003: 78).

(7.15) Stress alternation in disyllables:

citée ∼ *cítee; comfórt* ∼ *cómfort; divérs* ∼ *díverse;*

geáunt ∼ *géant; Plató* ∼ *Pláto; presént* ∼ *présent.*

Furthermore, the vast majority of the words attested with final stress in ME surface with initial stress in PDE. That is, although some alternation was allowed in verse, ME preserves the Germanic 'left-strong' system.

In the case of disyllabic words, Fikkert (2003) concludes that the stress patterns of disyllabic loan-verbs in ME tends to mirror OE prefixed verbs, i.e. the first syllables were left unstressed.

Table 7.8: Stress patterns in OE native words and ME loan words

	Noun	Verb
Native OE	*ýmbsittend* 'neighbour'	*ymbsíttan* 'surround'
ME loans	*tórment* 'torture'	*tormént* 'inflict pain'

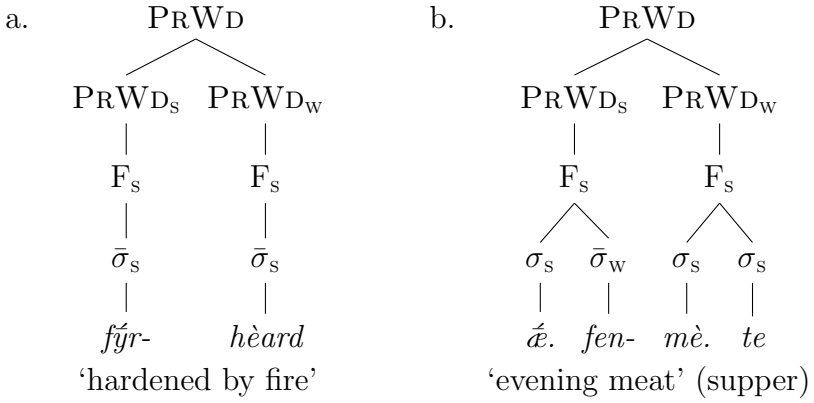
Ultimately, since OE had only monosyllabic verbal roots,[8] 'the natural interpretation of foreign disyllabic verbs was ... to consider them prefixed' (Fikkert 2003: 325). In other words, stress could still be assigned left to right, but it could skip the first syllable of disyllabic verbs.

[8]Verbs in OE were either strong monosyllables, inflected through ablaut grades, or jan-suffixed denominal roots (Fikkert 2003: 325).

7.5.1.3 Evidence for Old and Middle English foot structure

Since OE monomorphemic words were assigned main stress at the left edge and lacked any further secondary stress, we may say that they were made up of a single, left-strong foot, i.e. a trochee. For OE, as for most early Germanic languages, feet are prototypical lexical words (Russom 1998; Minkova 2008). This is further supported by the evidence from compounds, where each independently attested morpheme bears stress on the first syllable, with the leftmost foot bearing primary stress.

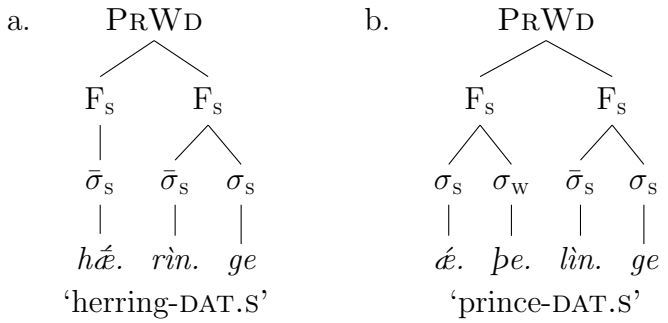
Figure 7.6: Foot structure of OE compounds



Further evidence for the internal structure of the foot is provided by inflected words which are able to bear secondary stress. Following Campbell (1959: 34-5), these words must be at least trisyllabic, with secondary stress being assigned to non-final syllables following a heavy syllable ($\bar{\sigma}$) or its 'equivalent', that is, a light syllable (σ) followed by another syllable, heavy or light. Feet may hence be assumed to include the stressed syllable ([x]) and following syllables up to the next stress.

Dresher & Lahiri (1991) propose the OE foot to be a resolved expanded moraic trochee. The foot has a minimally bimoraic head, a constraint satisfied by either a single heavy syllable ([H]), or a light syllable plus another syllable ([LL] or [LH]). Beside this head (in square brackets), the foot may optionally have an additional light

Figure 7.7: Prosodic structure of inflected OE words



syllable, making it a branching foot (([H]L) or ([LX]L)).

(7.16) The Germanic Foot (Dresher & Lahiri 1991):

Foot type: resolved expanded moraic trochee ([μ $\mu(\mu)$] μ)

Direction of parsing: left to right

Main stress: left

(7.17) Sample parsings: (Lahiri & Fikkert 1999: 245-246):

a.	(x .)	b.	(x .)	c.	(x .)	d.	(x)(x .)
	([$\mu\mu$] μ)		([μ μ] μ)		([μ $\mu\mu$] μ)		([$\mu\mu$])([$\mu\mu$]μ)
	wor. da		*we.ru.da*		*cy. nin.ga*		*ō. ðer.ne*
	'word-ACC.P'		'troop-ACC.P'		'king-GEN.P'		'other-ACC.S'

Note that only (7.17d) in the examples has more than a single foot, and hence has secondary stress. For the cases where the second foot is non-branching (in Campbell's terms 'the second heavy syllable or its equivalent' is not 'internal', 1959: 34–5), secondary stress is lacking. This is what Dresher & Lahiri (1991: 260) term Final Destressing (FD): the defooting of a final non-branching foot ($\otimes$).

(7.18) Final Destressing in OE (Dresher & Lahiri 1991: 260):

a.	b.	c.
(x)(⊗)	(x .)(⊗)	(x)(x)(⊗)
([μμ])([μμ])	([μ μ])([μμ])	([μ μ])([μμ])([μμ])
ō. ðer	*æ.ðe. ling*	*æ.ðe. lin. ges*
'other, NOM S'	'prince, NOM S'	'prince, NOM S'

The explanatory power of the Germanic Foot is of particular use as regards the changes in weight that took place during late OE and EME. Three types of weight change would have preserved, and even optimised, the OE foot structure: Consonant Extrametricality (CEM); Trisyllabic Shortening (TSS) and Open Syllable Lengthening (OSL).

Lahiri & Fikkert (1999: 246) claim lack of stress on final syllables would have been reanalysed in the synchronic grammar as CEM, that is, final consonants not following the weight-by-position parameter (Hayes 1989). As a result, the defooted final, non-branching foot is incorporated into the first foot (which becomes maximal, 7.9a-b). There are also cases however, where the final syllable cannot be footed at all, since the previous foot is already maximal (7.9c). Lahiri & Fikkert (1999: 247) suggest that TSS would be a solution to those cases that are not yet optimal. Shortening the vowels of the first syllables in trisyllabic words would have led to many more instances of the LX pattern to fill the head position of the Germanic Foot.

Finally, just as CEM and TSS exert pressure on the EME vocabulary to conform to a single foot, Lahiri et al. (1999: 709) explain OSL as a pressure to create branching, maximal feet. Hence, short vowels in open syllables of words made up of a single non-branching foot ([LL]), are lengthened if this will push the second syllable into the weak branch of the foot ([H]L), as in the case of OE *tale* 'tale' which surfaces in ME as *tāle*. Note that in the cases where TSS occurs (e.g. *clăveres* 'clover GEN S'), OSL is blocked, allowing the prosodic optimisation to occur. Ultimately, the net result of

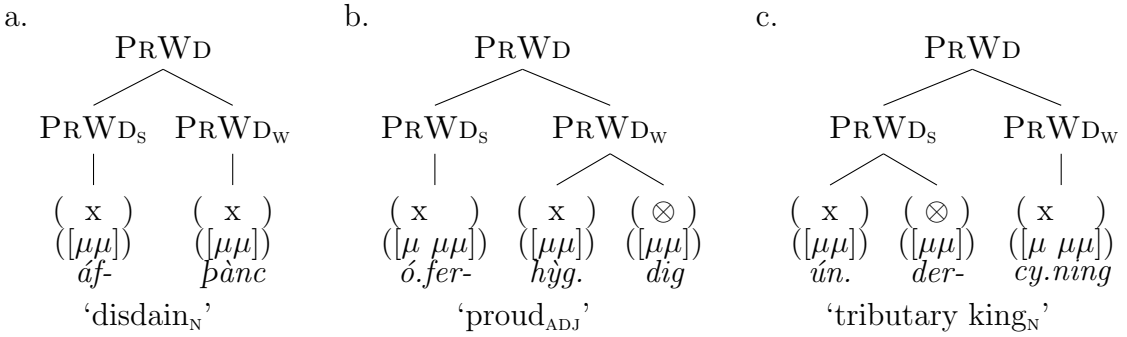
Table 7.9: Consonant extrametricality to trisyllabic shortening (data from Lahiri et al. 1999: 708 and Lahiri & Fikkert (1999): 247)

	FD	CEM	TSS	Examples
a.	([H])([H]) *stānas*	([H]L) *stāna⟨s⟩*	—	'stone- NOM.P'
b.	([LL])([H]) *werudes*	([LL]L) *werude⟨s⟩*	—	'troop-GEN.S'
c.	([H]L)([H]) *clāveres*	([H]L)L *clāvere⟨s⟩*	([LL]L) *clăveres*	'clover-GEN.S'
d.	([H])([H])([H]) *hærinｇes*	([H])([H]L) *hærinｇe⟨s⟩*	([LH]L) *hăringes*	'herring-GEN.S'

CEM, TSS and OSL is the reduction of the vast majority of native content words to a single branching foot.

This foot-based account, however, makes no claims as to the prosodic structure of prefixed words in OE and ME. If we consider the case of heavy and disyllabic nominal prefixes, we find that they pattern exactly as compounds would, since they are canonical prosodic words, with main stress falling on the first element (see Minkova 2008: 32-33).

Figure 7.8: Prosodic structure of OE heavy and disyllabic prefixed nouns/adjectives

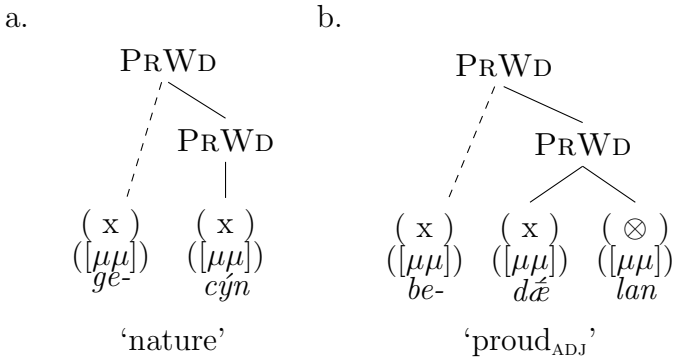


Note that *under-* in Figure 7.8c must necessarily be analysed as an independent prosodic word, otherwise its second syllable would have to be footed with the first

syllable of the root, or alternatively, be stressed. Neither of these options is motivated by the metrical structure of the language (see Minkova 2008: 28-29). Considering *under-* as a full PrWd makes it subject to FD in OE, hence keeping the morphological boundary and the reconstructed stress pattern.

Although the compounding analysis may adequately explain the structure of nominal prefixes that constitute a full foot, this strategy is not adequate for light prefixes, or for heavy verbal prefixes which lack main stress. From the perspective of the foot structure we have followed here, as well as the account given by Minkova (2006, 2008), light prefixes fail to meet the minimal foot and wordhood criterion and hence remain unfooted, lacking independent prosodic wordhood.

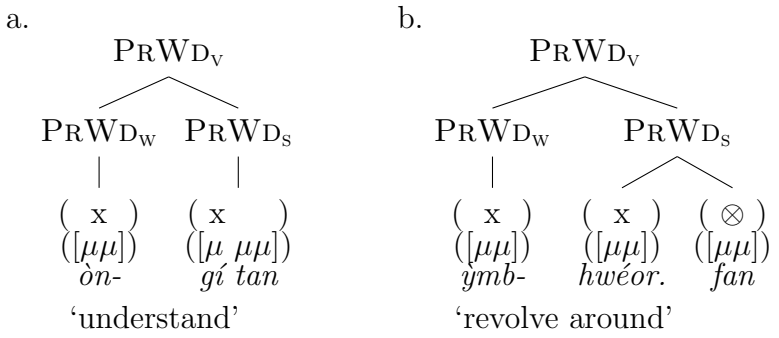
Figure 7.9: Prosodic structure of OE words with light monosyllabic prefixes



In the case of verbal prefixes which constitute full feet, their relation to the Germanic foot structure is less straightforward, since main stress falls on the second PrWd in the sequence. Nevertheless, and crucially to our argument, insofar as they constitute a foot and a prosodic word, verbal prefixes must bear a certain degree of stress. Hence, there must be a morphological rule that assigns main stress to nominal/adjectival prefixes, and to the root of prefixed verbs and adverbs (see Minkova 2008: 32-36).

Finally, since it is argued here that ME continued to have the same foot structure as OE, prefixes that could be footed independently would have also remained so in

Figure 7.10: Prosodic structure for OE verbs with heavy monosyllabic prefixes



ME. However, by the ME period the prosodic conditions of the language had changed slightly, especially as concerns the interaction of primary and secondary stress at the prefix-root boundary. The optimisation of the Germanic foot led to adjacent stress on prefix and root, a clash acceptable in OE, but no longer tolerated in the ME period. The historical evidence points to the resolution of this conflict not by upsetting the segmental or foot structure of the language, but by eliminating one of the conflicting morphosyntactic elements: the heavy monosyllabic prefixes.

7.6 Stress clash and language change: accounting for the data

The category of OE prefixed words where the prefix is not a full prosodic word has been shown to survive robustly into ME (cf. Table 7.10, a). However, the category of OE prefixed words where the prefix constitutes a full prosodic word is split in terms of survival. Disyllables (Table 7.10, b) are retained, while monosyllables are lost (Table 7.10, c).

It has been argued that all prosodic words were stressed in OE and ME, and hence,

Table 7.10: Prefixed words in OE and ME (stressed elements marked in bold)

	a. [PREFIX [**ROOT**]$_\omega$]$_\omega$	b. [[**PREFIX**]$_\omega$[**ROOT**]$_\omega$]$_\omega$	c.[[**PREFIX**]$_\omega$[**ROOT**]$_\omega$]$_\omega$
OE	[ge[cýð]$_\omega$]$_\omega$ 'country'	[[únder]$_\omega$[þèod]$_\omega$]$_\omega$ 'subject, subordinate'	[[óf]$_\omega$[þànc]$_\omega$]$_\omega$ 'envy'
ME	[y[fóunde]$_\omega$]$_\omega$ 'come.upon-PPL.'	[[únder]$_\omega$[bìshop]$_\omega$]$_\omega$ 'suffragan bishop'	—

the heavy monosyllabic prefixes would have incurred stress clash across the prosodic word and prefix-root boundary, eventually leading to their demise. What must be explained, then, is the development of the constraint against stress clash at this boundary.

The first notable development to this effect, is that, as a result of the changes in syllable weight that occurred in EME, feet were maximised, thus drastically reducing the frequency of word-internal stress clashes and increasing the frequency of branching feet. These changes must have created the percept of stress skipping at least one syllable before repeating in compounds and at the phrase level.

To these changes, we may add the adoption from Romance of the Countertonic Principle (Danielsson 1948: 27), which is said to reflect 'a balancing pattern relating to the wider stress-pattern, whereby there is a regular alternation between stress and non-stress within a polysyllabic lexeme' (Horobin & Smith 2002: 53). Hence, an Old French (OF) word such as *còuntenánce* would have been borrowed into English at least as early as the thirteenth century with a reversal of the original stress to fit the Germanic stress pattern: *cóuntenànce* (cf.Table 7.11). This particular variety of loans would have fitted in with the pattern of most OE compounds, strong-suffixed words, and the disyllabic prefixed words, providing an apparent alternation between stressed and unstressed syllables in longer ME words.

This percept of a regular stress/non-stress alternation is formalised by Minkova (2006: 115) as *LAPSE, a constraint banning the succession of unstressed syllables,

Table 7.11: Alternating stress in Romance loans in ME and OE complex words

Romance Loans	*cóuntenànce* 'countenance'	*cónsecrȁt* 'consecrated'
Native Compounds	*éaldor-mànn* 'elderman'	*ǽppel-wȉn* 'cider'
Strong Suffixes	*hǽþen-scìpe* 'heathen faith'	*cýne-dȍm* 'kingdom'
Disyllabic Prefixes	*ófer-læ̀g* 'cloak'	*fóre-mæ̀ra* 'illustrious'

comparable to what we now find at the EME prefix-root boundary: a constraint against the succession of stressed syllables. In the case at hand, the constraint is formulated at the level of the prosodic word, which is the key prosodic constituent for stress assignment. It states that there is a marked dispreference for adjacency of strong, stressed syllables (heads of feet) across PrWd boundaries.

(7.19) ME Stress clash avoidance constraint:

$$*\,\textsc{clash} : *[[\ldots\sigma_{s}]_{\omega}\ [\sigma_{s}\ldots]_{\omega}]_{\omega}$$

7.6.1 Heavy monosyllabic prefixes

The development of the constraint banning stress clash at the prefix-root boundary actively affected the makeup of the heavy native prefixes, which were faced with either loss or preservation in a relic form (lexicalisation), a choice that was likely determined by frequency of the prefix-root combination. In the case of prefix loss, clash was avoided simply by the absence of the entire prefix. In the case of lexicalised preservation, the prefix-root combination lost its morphological structure along with the independent prosodic wordhood of prefix and root.

Heavy prefixes in ME were often lost and replaced by either the simplex form of

Table 7.12: Patterns of OE heavy prefix loss in ME

OE Structure	Sample	ME Structure	Sample
$[[\text{PFX.}]_\omega[\text{ROOT}]_\omega]_\omega$	a. *òn-scúnian* 'shun'	$[\text{ROOT}]_\omega$	*shónen* 'shun'
	b. *ór-lège* 'war, strife'	$[\text{ROOT'}]_\omega$	*wérre* 'war'
	c. *òf-drǽdan* 'fear'	$[\text{Gmc. pfx.'}\ [\text{ROOT}]_\omega]_\omega$	*a-drǽden* 'fear'
	d. *èd-níwan* 'renew'	$[[\text{Lat. pfx}]_{(\omega)}[\text{ROOT}]_\omega]_\omega$	*re-néuen* 'renew'
	e. *òf-ðýncan* 'insult, annoy'	$[[\text{PFX.'}]_{(\omega)}[\text{ROOT'}]_\omega]_\omega$	*dis-plése* 'displease'
	f. *þùrh-drífan* 'pierce'	$[\text{ROOT}]_\omega$ ... $[\text{particle}]_\omega$	*dríven thúrgh* 'pierce'

the word (Table 7.12a) or by a different simplex word (Table 7.12b).[9] Another option was the replacement of the prefix with a reduced, light prefix (Table 7.12c). Often the semantic gap left by the loss of the OE prefixed word could be filled by an incoming Romance prefix (Table 7.12d), in which case stress followed the noun-verb alternation *ábstract-abstráct*. The OE prefixed word could also be replaced by a new prefixed word (Table 7.12e), whose morphemes could be taken from either native or Latinate stock. Finally, the option of a periphrastic construction was also often available, as in Table 7.12f.

Since, as we have seen, the development of the language displays weight changing processes (such as CEM, TSS and OSL), one may ask why English would adopt such a radical solution to the problem of *clash. The reduction of long vowels or the extrametricality of a segment might have been enough to assure the compatibility of prefix and root. Nevertheless, the crucial generalisation here is that the constraint is

[9]In some cases, as in the example, the native root was also lost, though no claim is made here that this was caused by the same pressures as those that brought about prefix loss.

active at the level of the concatenation of prosodic words, where segmental changes are no longer possible.

The repair strategies available, therefore, are not generated at the level of the word-phonology, but at the level of the morphosyntax. As a result, the speaker must choose to either eliminate the prefix, replace it with another form, or place it elsewhere in the phrase, as in the case of phrasal verbs.

Another path followed by prefixes was that of lexicalisation due to loss of morphological content (Table 7.13), a possibility only available to relatively frequent prefixed words.[10] In this case, it is proposed that the main stress pattern of the OE word is maintained, but, due to the loss of independent prosodic wordhood of the prefix and root (i.e. the dissolution of the prefix-root boundary), secondary stress is lost, hence avoiding stress-clash. Nouns came to be stressed on the first syllable of the word, losing secondary stress of the root-initial syllable, while verbs came to be stressed on the second syllable of the ME relic, losing secondary stress on the prefix.

Table 7.13: Patterns of OE heavy prefix lexicalisation in ME

OE Structure	Samples	ME Structure	Samples
a. $[[\text{PFX}]_{\omega}[\text{ROOT}]_{\omega}]_{\text{V}}$	*tò̆-rénden* ‘tear to pieces’;	$[\text{PFX}+\text{ROOT}]_{\text{V}}$	*tōrénten* ‘tear apart’;
	wìð-stándan ‘resist’		*withstánden* ‘withstand’
b. $[[\text{PFX}]_{\omega}[\text{ROOT}]_{\omega}]_{\text{N(ADJ)}}$	*fórð-sìð* ‘journey’;	$[\text{PFX}+\text{ROOT}]_{\text{N(ADJ)}}$	*fórthsith* ‘departure, death’;
	úp-rìht ‘upright’		*úp-riʒt* ‘upright’

[10] In our data we see that the vast majority of what we claim to be lexicalized relics are attested several times in the ME text. An exhaustive list is given here with numbers of attestations in parenthesis: *answare (13); wiþstonden (11); wiþdrawen (9); wiþholden (9); togedre (4); outcaste (4); todrawen (3); uphepyng (2); upryʒt (2); wiþseid* (2); *toward* (1); *torenden* (1); *insetten* (1).

7.6.2 Light monosyllabic and disyllabic prefixes

The EME constraint on stress clash at the prefix-root boundary applies vacuously in the case of both light and disyllabic prefixes. In the case of the former, they are unstressed since they cannot form an independent, bimoraic PrWd. For the latter, no clash occurs since a second syllable intervenes between the stressed syllable of the prefix and the root.

Table 7.14: Structure of light prefixes in OE and ME words

OE Structure	Sample	ME Structure	Sample
$[\text{PREFIX}[\text{ROOT}]_\omega]_\omega$	*becwéðan* 'assert';	$[\text{PREFIX}[\text{ROOT}]_\omega]_\omega$	*biqué̋then* 'assign';
	gesmítan 'smeared'		*ysmi̋ten* 'stricken'

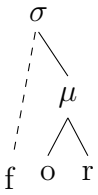
Table 7.15: Structure of disyllabic prefixes in OE and ME words

OE Structure	Sample	ME Structure	Sample
$[[\text{PREFIX}]_\omega[\text{ROOT}]_\omega]_\omega$	*fórehèafod* 'forehead';	$[[\text{PREFIX}]_\omega[\text{ROOT}]_\omega]_\omega$	*fórehèd* 'forehead';
	òfersíon 'look over'		*òversé̋n* 'survey$_V$'

Interestingly, the OE prefix *for-*, although a closed syllable, lacks stress throughout the history of the language (cf. Minkova 2008: 22). Its preservation into the ME period constitutes further grounds for arguing that *for-* is prosodically light. Such a state of affairs can be explained by the relatively high sonority of the rhotic, which would have allowed it to syllabify within the prefix's head mora. The independent process of reduction in ME unstressed vowels no doubt further facilitated this monomoraic interpretation.[11]

[11]Such a structure must be lexically specific, since a prefix like nominal *or-* does not become destressed, and ultimately follows the diachronic path to loss. This lexical stipulation is not, however, purely *ad-hoc*, but relies on *for-*'s relatively high frequency (cf. Figure 7.4.3.2), allowing it to adopt a more idiosyncratic syllable structure. Importantly, light syllables with sonorant codas are observed in other Germanic languages, as in Dutch (see Trommelen 1983).

(7.20) Proposed rime structure within the prefix *for-*:



Such a pattern would likely have been interpreted by speakers' grammars as closer to that of unfooted, light prefixes (*be-, ge-* and *a-*), than to footed, heavy ones. Whether or not this is the case, we claim that for the purposes of stress assignment as well as preservation in the face of stress-clash, *for-* is indistinguishable from light prefixes.

Table 7.16: Structure of *for-* prefixed words in OE and ME

OE Structure	Sample	ME Structure	Sample
$[\text{PREFIX}[\text{ROOT}]_\omega]_\omega$	*forsacan* 'refuse';	$[\text{PREFIX}[\text{ROOT}]_\omega]_\omega$	*forsáken* 'repudiate';
	forþóhte 'desperate'		*forthúhte* 'grieved'

7.6.3 A different path of development: *un-* and *mis-*

The prefixes *un-* and *mis-* appear not to follow the straightforward generalisation of heavy monosyllabic prefix loss. As a matter of fact, in the corpus data, *un-* and *mis-* were found to be robustly productive at the time of the composition of Chaucer's *Boece*. The five century gap in the evidence presented in the corpus data, however, makes important processes opaque.

The OE evidence for *un-* indicates that the nominal form of the prefix was not consistently stressed, but alternates frequently. In this respect, Kendall (1981: 41) states that '[t]hough the fact that *un-* was not originally a verbal prefix suggests that it should be accented, it is clear from the evidence of *Beowulf* (and elsewhere) that an unstressed form existed side by side with the stressed prefix'. In a close examination

of the seventy attested uses of the prefix in *Beowulf*, Kendall concludes that the poet had the choice of either stressing the prefix or leaving it unstressed.

(7.21) Optional stress for the prefix *un-* in *Beowulf* (examples from Kendall 1981: 4):

a. *eteð angenga únmurnlīce,*
solitary prowler without-a-care
'the lone-goer remorselessly' (Beo, 449)

b. *se þe unmúrnlīce madmas dæleþ,*
he that without-a-care treasures gives
'who with no regrets gives away treasures' (Beo, 1756)

In ME, the patterns of alliteration of *un-* show that, 'promotion of this prefix is optional' (Minkova 2003: 55), that is, the ME prefix was unstressed unless the poet or copyist saw it fitting to change that stress to fit the verse. Such a practice appears to be at odds with the consistency of stress in the oral tradition of OE (*ibid*, 59).

While stress on *un-* shows an alternation in OE, by ME the prefix was mostly unstressed, varying somewhat artificially in written metre. Furthermore, Minkova's (1997) analysis of *un-* in EME verse provides an interesting piece of data, as she finds absolute lack of stress in the prefix. In particular in the metre of the *Proverbs of Alfred* (PA), an early alliterative ME text, *un-* surfaces consistently in unstressed position.

(7.22) Unstressed *un-* in EME verse (from Minkova 1997: 448, alliterating consonant in bold):

a. *for **b**etere is **b**ern unb**b**orn þanne unib**b**eten.*
for better is child unborn than unbeaten
'for better is a child unborn than unbeaten.' (PA, M 243-45)

From the perspective of our argument, destressing is a sign of clash avoidance, which crucially occurs during exactly the same period where heavy, stressed prefixes were lost across the language.[12] To this, we may add the observation made by the

[12]Here, as in the case of *for-*, high sonority of the coda consonant, as well as incipient vowel reduction must have played a part in allowing some highly frequent instances of the prefix to pattern with light prefixes, and hence survive into the ME period.

OED with regard to the non-verbal forms of the prefix: 'altogether, the number of *un-* words recorded in OE is about 1250, of which barely an eighth part survived beyond the OE period.' Although new *un-* prefixed words have entered the language since the OE period, there seems to have been a specific point in the history of the language when, regardless of its semantic strength, the prefix became dispreferred.

In the case of *mis-* it is generally agreed that the prefix 'became contaminated with French *més-* and gained extra life from it' (Bauer 2003: 34).[13] Evidence for this are cases such as ME *misbelieve*, modelled after the Anglo-Norman *mescreire* 'misbelieve' (cf. OED entry). The ultimate result would have been the licensing of the *mis-/mes-* prefix attaching to both native and borrowed roots. This is compatible with the growth in the frequency of the prefix in the corpus data.

According to the OED, there are approximately 40 roots attached to the prefix *mis-* in OE. Of these, only about half survive into ME. We may deduce, hence, that the process of decay due to stress clash was well underway before the merger with NF *mes-*. As in the case of *un-*, the avoidance of stress-clash must be the result of the demotion of the prefix's stress (i.e. the loss of its independent prosodic wordhood),[14] which would also have been the first stage in a process of lexicalisation whose progression was prevented by NF *mes-*.

The examples in Table 7.17a show loss of independent prosodic wordhood for verbal and nominal *mis-*, with concomitant stress-clash avoidance. Ultimately this led to preservation into LME with strengthening from incoming *mes-*. Note that PDE assigns secondary stress to *mis-* prefixed words, regardless of word category,[15] a sign that the

[13]See also Marchand 1969: 176 fn.; Lutz 1997: 280; OED 1989.

[14]The coda sibilant's ability to widely resyllabify was instrumental, no doubt, in *mis-* prefixed words' survival. In the face of stress clash, the coda must have been interpreted as belonging to the following syllable (cf. *mi.slé.dan*) thus making the prefix light and unable to form an independent foot and PrWd.

[15]The only exceptions seem to be *míschief*, a very early borrowing from NF, where it was already prefixed by *mes-*, and the rather late coinages, *mísprint*, *mísfit* (first attested 1813 and 1823 in the OED).

Table 7.17: Paths of survival (a) and decay (b) for *mis-* prefixed words (⊗ = prefix lost in clash)

	OE Structure	EME	Late ME Structure
a.	[[PREFIX]$_\omega$[ROOT]$_\omega$]$_\omega$	[PREFIX[ROOT]$_\omega$]$_\omega$	[PREFIX[ROOT]$_\omega$]$_\omega$
	mìslǽdan 'mislead' *mísdæ̀d* 'evil deed'	*mislédan* 'mislead' *misdà̀de* 'evil deed'	*mislédan* 'mislead' *misdè̀de* 'evil deed'
b.	[[PREFIX]$_\omega$[ROOT]$_\omega$]$_\omega$	[[PREFIX]$_\omega$[ROOT]$_\omega$]$_\omega$	
	mìscírran 'pervert$_v$' *míshàrness* 'disobedience'	⊗-*cháren* 'change in character' ⊗-*hárneis* 'fittings, harness'	—

OE noun-verb stress alternation has been lost in this case, just as in that of light prefixes. The examples in Table 7.17b show the loss of the prefixed form due to stress clash with the root.

7.6.4 Constraints on the prosodic word: verb-noun stress alternations in ME disyllables

Aside from loss, stress clash also led to the dissolution of the prefix-root boundary in the case of lexicalised prefixes. These forms lost secondary stress but preserved the main stress alternation of OE prefixed nouns and verbs. Crucially, OE prefixed verbs that were lexicalised in ME did not follow the Germanic trend of stressing the first syllable. Furthermore, the words were no longer considered synchronically prefixed, so the verb/noun alternation was not simply a question of affix stress, but one of word category, specifically among disyllables.

Although Fikkert's (2003) claim that disyllabic Romance borrowings in ME followed the pattern of OE prefixed words is not disputed, a stage is missing from her analysis.

Some Romance verbs may well have been borrowed very early, with stress on the second syllable taken directly from prefixed words. For the vast majority of the borrowed disyllabic verbs, however, the original distinction was no longer available, since the prefixes were lost. In these cases, it is claimed here that the verbal stress pattern of loans was taken by analogy with relic forms, where the erstwhile prefix was fully defooted. The original morphological structure of the relic prefixed words was by then gone, hence the stress alternation between nouns and verbs is reanalysed in the synchronic ME grammars as an alternation clarifying word-category membership.

Figure 7.11: Stress on verbs with disyllabic roots in ME (⊗ = defooted, lexicalised prefix)

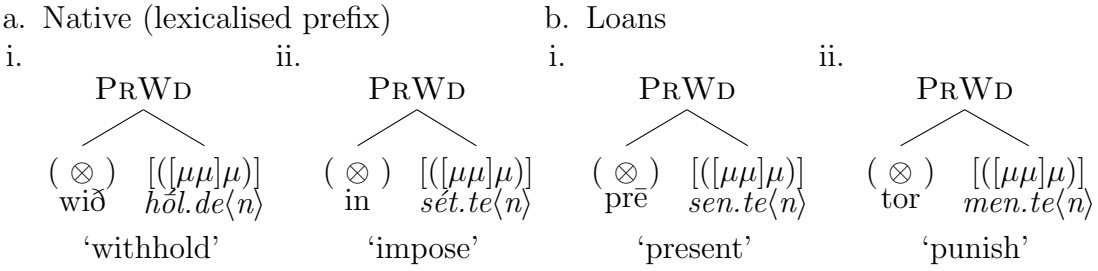
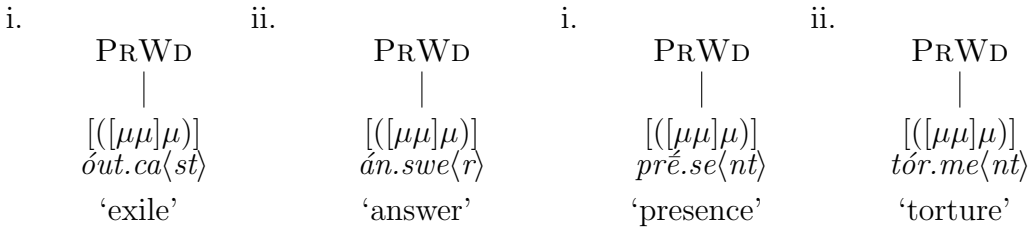


Figure 7.12: Stress on nouns with disyllabic roots in ME



Note that for verbs the first foot of the word (the OE heavy prefix) is defooted, while in the case of nouns, footing corresponds to the native Germanic system, allowing for a single foot in disyllables.

7.7 Conclusions: prosodic optimisation, prefix loss and preservation

When viewed from a distance, the loss of OE prefixes in ME can be characterised as the end-state of a process of grammaticalisation. Independent IE adverbials seem to have gradually merged with Germanic words, lost semantic and syntactic independence in OE, and finally either disappeared or became indistinguishable from other simplex words in ME. Nevertheless, if the goal of our account is to understand the final stage of prefix loss, a grammaticalisation analysis gives no principled means for distinguishing lost and preserved prefixes; thus attempting a sweeping historical account, at the expense of true explicative power.

Following Hyman's (forthcoming: §2) claim that 'it would be folly to attempt to analyse English without stress', as well as the idea that the language presents a 'dominant accent' type (van Coetsem 1996), alongside a high degree of 'metrical coherence' (Dresher & Lahiri 1991) has led us to explore the motivations for prefix loss and preservation from a purely prosodic perspective. It is claimed here that, for a language with the morphological and prosodic characteristics of English, this type of analysis allows the structural differences between lost and preserved prefixes to emerge, removing the need for word-category specific accounts.

It was argued here that prototypical OE roots were made up of a single, weight-sensitive, optionally branching, left-headed foot (i.e. the Germanic Foot). OE root-stress often clashed with other morphemes in word formation processes, a situation that was not proscribed in the earliest stages of the language. The transition to ME, however, brought with it a tendency to optimise the foot by way of a series of weight alternations that created maximal, branching feet. This tendency, along with the growth of the Countertonic Principle in Romance loans, led to the synchronic percept of a reg-

ular stress/non-stress alternation in the language. In this new situation, words with heavy monosyllabic prefixes displayed an undesirable succession of stressed syllables at the prefix-root boundary, which ultimately brought about prefix loss and lexicalisation. Therefore, the greater entrenchmnent of the Germanic Foot in EME would have played an important part in triggering the rise of the clash-avoidance constraint, which in turn led to the loss of heavy monosyllabic prefixes.

Contrary to semantic arguments for prefix loss (Hiltunen 1983; Kastovsky 1992), as well as views of their grammaticalisation (Booij & van Kemenade 2003) or phonotactic destabilisation (Lutz 1997), OE prefixes were lost in order to preserve a perceived structural requirement of the language. The guiding force here is not the preservation of morphological structure – as suggested for changes in Mapudungun stress (§5.5.6.3) – but rather the maintenance and optimisation of prosodic form. Therefore, loss was the result of an active process rather than a passive one.

The data we present for Early English falls in with the growing body of literature viewing the preservation and optimisation of prosodic structure as driving forces in the evolution of language (see Dresher & Lahiri 1991; Kiparsky 1998; Lahiri et al. 1999; Fikkert et al. 2006). Such an approach is premised on theories of prosodic morphology (McCarthy & Prince 1986, 1990; Downing 2006), where the synchronic shape and possible combination of morphemes is constrained by language-specific prosodic templates. Based on such a view, a language's preference for specific prosodic structures may push it to change over time, creating greater conformity with these structures.

This type of prosodically driven account of change, however, need not be universally applicable and, as we have seen in the case of Mapudungun stress changes, cannot even be extended to all stress-languages (cf. §5.39 and §8.2.1). In Chapter 8, it will be claimed that there is at least a logical link – if not a fully developed typological one – between the morphological structure of a language and the properties of its

stress system. In Early English, the radical effects of prosodic structure are claimed to be linked to the language's fusional morphology, as appears to be the case for Mapudungun as well, regarding its polysynthetic, agglutinating morphology and the more functional role it assigns to stress. What is clear for both languages, however, is that features perceived as more basic by the speakers and learners of the language are preserved (often to the detriment of other features), a characteristic of grammars termed *pertinacity* (Dresher & Lahiri 2003).

As regards the diachronic development of OE prefixes, the importance of the division between heavy prefixes – which were lost – and disyllabic and light prefixes – which were preserved – is clearly much greater than that of the division between the word categories they attach to, or between their degree of semantic or syntactic independence. Although the influence of semantic and syntactic factors upon the history of English prefixation is not denied altogether here,[16] there is no doubt that a prosodic account fits in much more naturally with the important quantity and weight adjustments that ran through the English language around the time of the Norman invasion.

[16] Along with the variability of its stress, semantics is likely to play a part in the preservation of *un-*, as in loss of *ge-* and *for-* in Early Modern English. Syntactic arguments may also play a part in the loss of *ge-*, as inflectional morphology became dispreferred.

Part III

Early English *vis-à-vis* Mapudungun

Towards a general theory of diachronic morphoprosody

Chapter 8

Conclusions *Morphology vs. Prosodic Structure: A role for pertinacity*

The main thread throughout the analyses in the preceding chapters focuses on the relation between stress and morphological units, both synchronically and diachronically. We have seen how, in the data for both Mapudungun and Early English, the stem-affix boundary presents non-trivial alternations as regards the position of stress. This is particularly so for affixes attaching to the strong edge of the prosodic word – suffixes in the case of right-strong Mapudungun, and prefixes in left-strong Early English.

In both languages, the relevant stem-edge syllable tends to bear a degree of stress, as do some of the affixes that attach to it, with the result of frequent stress clash across the morphological boundary. The main differences between Mapudungun suffixes and the Germanic prefixes of Early English has to do with how strongly the morphological and prosodic elements hold their ground against each other.

In the case of OE, prefixes may be parsed as independent PrWds if they fulfil the minimal word criterion of two moras. This means that light monosyllables – which are monomoraic – are prosodically dependent on the stem, while disyllables and heavy

monosyllables – bimoraic or longer –are prosodically independent and must therefore bear stress (secondary in verbs, primary in nouns). In the case of the heavy monosyllables, this meant stress clash with a stem-initial foot. Due to internal and external factors (cf. §7.6), this state of affairs became dispreferred throughout successive stages of the language, leading to prefix reduction, separation, lexicalisation and loss.

The structural requirements that stress imposes on Early English morphology, therefore, seem to trump the preservation of the elements themselves, as morphosyntactic and semantic units. This is not only the case for prefixes, but also for suffixes at the 'weak' edge of the word. The word-prosodic structure of the language is, in a sense, tyrannical,[1] insofar as it enforces its dominance by purging those elements which do not confirm to its programme (i.e. feet are optimally branching, and clash is avoided across morpheme boundaries). Of course, this finding fits in with the claim that Early English places a high value on 'metrical coherence' (cf. Dresher & Lahiri 1991).

In the case of Mapudungun, at early stages of the language's history (I and II), the predicted position for stress at the right edge of the word (on a right-aligned trochee) became progressively coextensive with the final syllable of the verb-stem (§5.5.1). This domain, defined as all morphemes excluding mood, person and number, appears to have borne some degree of stress independently. As a result of the transition from syllabic to moraic trochees at the word-level, however, stem-final stress became mostly redundant, since word- and stem-stress were consistently conflated. It is our claim that the loss of demarcational information these changes entailed, led to stem-final stress being re-instated under the form of root-final stress (Stage III, cf. §5.5.2).

By PDM (Stage IV), the stem domain appears to include more than just the bare root, however. Particularly, there are a series of stem-extending suffixes that add core

[1]Recall the oft-cited quote from Greenberg & Kaschube (1976: 9): 'If stress is monarchic, and length oligarchic, we may say that tone is democratic.' If all stress systems are monarchic', the 'dominant' or 'prosody-strong' systems may be characterised as tyrannical.

semantics to the verb and which receive stress almost invariantly (cf. §3.4.3.1). At this stage, word and stem-level stress may be immediately adjacent, with clash usually being resolved in favour of word-level stress. Importantly, stress only appears to have a hierarchical structure where clash is involved. In verbs, then, the non-stem-forming suffixes take stress unless the stem is derived, in which case the stem-extending suffixes take main stress. We have explained this alternation as a result of cyclic application of stress rules at the stem level, which promotes the stem stress over the word/suffixal stress (cf. §4.3.2). In the cases where non-stem-forming verbal suffixes are made up of a single mora, only stem-stress is manifest. This, of course, is different from nominal compounds, where both elements must bear stress regardless of whether they can form a full trochaic foot (cf. §4.2). Furthermore, when there is stress clash, it is the morphosyntactic structure of the compounds that brings about resolution in favour of the head (cf. §4.2.4.1).

Mapudungun, in contrast with English, privileges integrity and overall transparency of morphology, over prosodic structure. The language not only allows for some flexibility in the position of prominences, but even displays diachronic re-positioning of stress in order to clarify morphological boundaries. In this sense, stress has a subordinate or accommodating role in relation to the morphological structure.

It has become progressively clear, then, that the different behaviour of the two languages with regard to the morphology/prosody interface is related to the overall role that stress plays in the linguistic system at large. While the features of Mapudungun stress are consistent with its predominantly functional role, the characteristics of stress in English – and in Germanic in general – are above all formal (§0.1). We argue, furthermore, that the differences in resolving the issues of stress conflation and clash within the two languages is linked (although most likely, non-essentially) to the typological profile of the languages and the role of the morphosyntactic word within

them.

In the following sections, we will review some of the basic differences and similarities in the structure of the languages §8.1.2, and some of the data issues regarding these differences §8.1.3. We will then go on to see how our analysis falls in with the main claims in the literature on the phenomena we haves studied §8.2.3. In §8.2 we will summarise the main typological inferences the data for Mapudungun and Early English can give us regarding the diachronic interaction of morphology and prosody in different language types, in order to finally assess the role and relative importance of stress within the synchrony and diachrony of a language's morphology §8.3.

8.1 Mapudungun and Early English: *Differences and similarities*

Some of the more basic differences between the two languages we have studied are relatively obvious. The first of these, of course, relates to their family membership. While English falls within a clear, well studied family of languages – Indo-European – Mapudungun is presumed to be an isolate, which is most likely a reflex of the paucity of historical data for Amerindian languages (cf. Fig. 6.1 and §1.1).

8.1.1 Historical, social and contact factors

Another key issue on which the languages can be compared regards the historical, social and contact conditions of the studied periods. In the case of Mapudungun, the history of the language goes hand in hand with progressively more intense contact with Spanish. As we have seen, the number of speakers at the time of European arrival is estimated at around one million, a number that is greatly reduced today (we generously

estimated 150,000 in §1.1), with native fluency and transmission severely compromised (cf. Zúñiga 2007a, Gundermann et al. 2011). Furthermore, from the 16th to the 19th century, Mapudungun and Spanish speakers were in a state of almost continual war with each other. In the territories where this was not the case – particularly for the northernmost Mapuche lands and dialects – the Mapuche were quickly subjugated and assimilated both culturally and linguistically. Since the late 19th century, with the official end to the military confrontations, the remaining Mapuche have followed in this path of acculturation, becoming a marginalised part of the Chilean national society. This new position has provided them with shrinking incentives to preserve their language (cf. §1.1 and §5.5.5).[2]

The contact conditions of Early English are somewhat different both in terms of their nature and effects. Focusing on the interaction with Scandinavians and Normans (cf. §6.1.1), there is no doubt that relations were initially bellicose. However, in both cases a relatively peaceful co-inhabitance ensued. In the case of the Scandinavians who settled in the British Isles, relations with the English-speakers were no doubt neighbourly, with shared cultural traits and little social differences between the two groups. This soon led to them becoming indistinguishable. On the other hand, with the Normans, the changeover in the origin and language of the governing classes most likely had only marginal effects on the general English-speaking populace. In neither case are the invasions associated with a significant drop in the numbers of native speakers of English or in the transmission of the language to subsequent generations.

In both cases, the languages were under significant contact during the relevant period. In the case of English, the two main contact languages are members of the same language family, and furthermore, ON, with most intimate contact, is a fairly close relative, which Kastovsky (1992: 329) estimates as having perhaps less mutual

[2]The situation for the Mapuche and their language in Argentina is even less auspicious, cosiddering their smaller overall numbers.

intelligibility than modern High German and Dutch speakers. Although creolisation may be slightly inadequate as a characterisation of the contact, it is likely that there was a fair amount of structural borrowing. It is our claim that, even though the conditions that spurred the loss of heavy monosyllabic prefixes were mostly language internal (as were the causes of the general 'analytic drift'), the repair strategies that were made available to speakers can be explained by a degree of contact-induced reinforcement (cf. §6.1.2).

In the case of Mapudungun, the contact is with a completely unrelated and typologically dissimilar language. Up to the late nineteenth century, furthermore, the contact was restricted, with a limited amount of direct contact between speakers of the two languages and bilingualism being rather rare (cf. §5.5.5). Under such conditions, it appears that borrowing of anything more than single content words would have been rare until the turn of the twentieth century. The stress system, furthermore, would not have been affected greatly either, the changes towards a right edge moraic trochee – consistent with Spanish default stress – having happened well before much of the contact became a fact of every day life (cf. §5.5.1).

8.1.1.1 Borrowing and change

Although the theoretical literature on lexical borrowings and language change is copious and we can only begin to scratch the surface of such issues here, we have shown in our data for both Mapudungun and Early English that large amounts of lexical borrowings do not necessarily have an immediate effect on the patterns of native morphology and prosody.

As we claimed for the early Middle English period in Chapter 7 with regards to the changes in prefixes, it was not the case that changes in the basic structure of a language came from simple incorporation of a large number or borrowings from NF and

ON during the EME period. In place of Marchand's claim that 'the language took to wholesale borrowing, a method which meant an enormous cut-down on the traditional patterns of word-formation' (1969: 131), we have suggested that the processes leading to prefix-loss and lexicalisation were a result of the ongoing language-internal processes of foot optimisation (cf. §7.6).

Mapudungun seems to behave quite similarly, the large influx of Spanish words between the 16th and 19th centuries having little incidence on the prosody of the language. Key to the interpretation of both languages is that the vast majority of the speakers of English and Mapudungun in the relevant period would have had very limited first-hand contact with the incoming languages, and bilingualism would have been relatively restricted. As a result, the native patterns of the two languages were preserved even if independently, they were in flux.

In English, large-scale borrowing did ultimately have effects on the general structure of the language, with non-native prefixes being incorporated in the LME period, and Latinate vocabulary filling the semantic gaps left behind by prosodically-conditioned prefix-loss. However, we claim these were independent from the conditioning factors of prefix-loss loss, occurring at a later stage overall. For Mapudungun, it was only once bilingualism became widespread – in the 20th century – that deeper contact-induced changes spread through the language (cf. §5.5.5). As regards the prosody, we have suggested that the major effect of this contact may be the prevention of change rather than the promotion of it. This is particularly the case for the growing tendency to stress final open syllables in disyllabic nouns (cf. §5.5.6.2).

8.1.2 Structural differences and similarities

The major structural issues that we examine in counterpoint for the two languages are morphological structure and stress features.

8.1.2.1 Morphological structure

From a morphological standpoint the earliest stages of attested English and Mapudungun are less different than their current forms. This is mostly due to the position of English within the synthetic/analytic continuum, which has moved rather swiftly from relying heavily on inflection to using mostly word order and periphrasis to convey grammatical relations and semantic distinctions (cf. §6.1.2).

In the case of Mapudungun, the polysynthetic character of the language places it quite far towards the synthetic end of this same spectrum. This said, even the oldest attested Mapudungun is not purely or ideally polysynthetic (in the sense of §1.2.2.1), since some periphrastic constructions do exist, incorporation was never obligatory, and word order seems to have had some relevance in determining the grammatical roles of participants within a clause (cf. §1.2.2). Furthermore, although data in the literature is somewhat impressionistic, it seems that, under the influence of Spanish, speakers are less likely today to use the same range of verbal morphology, or nominal incorporation, as was found in earlier stages (Salas 2006: 28-30).

In other words, then, although the two languages begin their attested history leaning toward synthetic patterns, they both end up moving towards analytical structures. Of course, the starting point is much further to the synthetic end in the case of Mapudungun, and the shift has only recently been more evident. In the case of English, the language begins only as moderately synthetic,[3] and moves firmly apace toward the analytical camp.[4]

With regards to the continuum spanning agglutination and fusion, the two languages appear to have come closer, at least at a first glance. If we recall that there is

[3]While the inflectional morphology of OE is relatively complex, derivation is only moderatly so, and incorporation is non-existent.

[4]In Roger Lass's terms: 'The Middle English evolution consists primarily in a shift towards a more analytic structure, eventually approaching that of today's language, which, except for the pronoun and some residues in the verb and noun, is close to isolating' (1992: 94).

'typically a one-to-one correspondence between a morpheme and its meaning' in agglutinating languages (cf. Aikhenvald 2007: 4), we may say that Mapudungun has changed little with respect to the functional and formal uniqueness of most of its morphemes. This said, the language was never purely agglutinating, as the historical evidence shows a few portmanteau morphemes are always attested in its inflectional system (notably the -IND.1S *-n*, the -SUBJ.1S *-le*, the -SUBJ.2S *-le*, the -IMP.1S *-tʃi*, the -IMP.2S *-pe*, and the -IMP.3S *-ŋe*).

On the other hand, English, which was originally clearly fusional (see §6.1.2, 6.2), appears to have shifted somewhat towards a more agglutinating structure. Crucial to this process was the loss of the vast majority of the meaning distinctions conveyed by its inflectional suffixes and the privileging of a single, core distinction per word category (number in nouns, tense in verbs). This, as we have mentioned (see §6.1.3), occurs mostly as a result of gradual phonological reduction of the relevant suffixes, which allows for fewer distinctions. The process, overall, displays a certain 'directionality':

> 'The evolution in both noun phrase and verb shows a characteristic English (and to some extent Germanic - except for German and Icelandic) tendency: a move away from the multiparameter inflection typical of the older Indo-European languages to a restricted system with one exclusive or dominant parameter per part of speech.' (Lass 1992: 123)

Although in strict definitional terms, this appears to be a transition from fusion to agglutination, the fact that no more than one parameter is left for inflecting each word category – usually alternating with -∅ – actually places the language closer to the isolating type. Viewed in this light, of course, the contrast with Mapudungun is actually much greater than at first sight.

If there is a morphological feature that is clearly shared by both languages throughout their history, it is their predominantly suffixing nature. This is not typologically

rare, but provides some additional grounds for the disfavour of prefixes in English. In a sense, the fact that English is not predominantly suffixing is an additional proverbial nail in the coffin of the clashing prefixes. In Mapudungun, though a number of prosodic phenomena present hiccoughs at the stem-affix boundary, loss of suffixes is out of the question, among other reasons, because of the extremely robust suffixing patterns of the language overall.[5]

8.1.2.2 Stress

The fact that our analysis for Mapudungun and Early English present similar foot structures (varieties of weight-sensitive trochees), actually betrays the fact that the two languages are radically dissimilar as regards some more basic aspects of stress and prosodic structure. As we have already suggested (cf. §0.1), while Mapudungun stress plays a predominantly functional role, Early English stress is mostly formal. These differences can be seen in the extent to which the languages use stress to clarify other aspects of the linguistic system and the amount of restrictions that prosody imposes on their morpho-phonological structure.

Synchronically, these deep-seated differences are most clearly visible with respect to the issues of rhythm, culminativity, positional prominence and demarcation. The first three of these features are more important from a formal standpoint, while the last is best analysed from a functional one.

Rhythm: Rhythmic distribution of stress relates to the percept that 'syllables bearing equal levels of stress tend to occur spaced at roughly equal distances, falling into alternating patterns' (Hayes 1995: 25). OE and ME show unambiguous evidence for

[5]The evidence for prefix-like elements in Mapudungun is somewhat tenuous. Salas (2006: 178) claims that verb roots with modal functions such as *kim-* 'know', *kɨpa-* 'want', *pepi-* 'be able' are prefixed to the other verbal roots, a state of affairs analysed elsewhere as root serialisation (cf. Zúñiga 2010: 211, Fernández-Garay & Malvestitti 2008, and §1.2.2.1).

the possibility of words having more than one stress, which surface at predictable intervals (§7.5.1.3). In fact, although not a perfectly bounded, alternating system, Early English stress is undoubtedly rhythmic, a feature that is exploited in its verbal art, as well as showing regular adjustments in the post-lexical phonology (cf. compounding rules, and the English Rhythm Rule).[6]

The alternation of stresses is seen word-internally in OE and ME as the iteration of mostly branching feet, and postlexically as the bimoraic minimal word requirement. This ultimately resulted in avoidance of adjacent stressed syllables, as well as avoidance of longer strings of stressless ones (i.e. clash and lapse), a feature that has been important for our analysis of the general stability of heavy monosyllabic prefixes.

Stress languages, however, vary in degree of rhythmicity. In contrast with English, our data shows Mapudungun stress not to be rhythmical in the same foot-based sense. Against the perfectly bounded system that is claimed in the literature (on the basis of Echeverría & Contreras 1965), we find that at all stages of the history of Mapudungun a single foot seems to align to the right edge of the word, while another is placed at the right edge of the verbal stem. The history of the language suggests that these two stresses may be found immediately adjacent, even appearing to coincide in some cases. Synchronically, clash seems to have been resolved in favour of one of the two conflicting elements (cf. §4.3.4). Diachronically, the coincidence of stem and word stress appears to have triggered the re-definition of the stem as a domain for stress (cf. §5.5.2, §5.5.6.3).

In short, although iterativity is not a robust feature of Mapudungun, it seems that the language tries to optimise the prominence contour of words by synchronically promoting one of two clashing syllables or diachronically reassigning the domain for

[6]The rhythmicity of Early English, although key to the entire linguistic system, differs from that of languages which display longer words with clear word-internal iteration. Such systems are claimed for languages such as Maranungku (Tryon 1970) and Pintupi (Hansen & Hansen 1969).

stress. The claim here, however, is that this alternation is not based on the iteration of feet (cf. §4.5.1.1), as in English, but rather on the signalling of morphological structure, or on stress' demarcative function. Features such as cyclic stem-building and clash resolution in PDM are therefore not meant to optimise the rhythmic structure of the language, but to optimise the perceptibility of morphological boundaries.

Culminativity: Although this aspect of stress systems is often related to the idea that 'every prosodic word contains one and only one head foot, which is the locus of main stress' (McCarthy 2003: 110), Hyman (2006, 2009, forthcoming), argues for a distinction between the minimal and maximal requirement for the highest-level of prominence within a word.

(8.1) Minimal and maximal requirement for highest-level of prominence in stress systems, according to Hyman (2006: 231):

a. OBLIGATORINESS: every lexical word has *at least* one syllable marked for the highest degree of metrical prominence (primary stress);

b. CULMINATIVITY: every lexical word has *at most* one syllable marked for the highest degree of metrical prominence.

It is Hyman's claim that while both features are crucial to stress systems, only OBLIGATORINESS is definitional. In other words, the most basic requirement of a stress-language is 'that an obligatorily headed metrical constituent be built at the word level' (Hyman 2006: 231). Lexical wordhood, in such languages, is therefore defined on the basis of the presence of a main stress.

OBLIGATORINESS is key in the system of both Early English and Mapudungun. We see this, in particular, with regards to compounds and compound-like structures. Recall that OE and ME display foot-based constraints on minimal wordhood (cf. §7.5.1.1). Where these conditions are not met in Germanic prefixes (cf. *be-*, *a-*), the prefixes

cannot be stressed, do not clash with root-stress, and are ultimately preserved. Crucially, there is no stress on the prefixes unless they can be full PrWds, as is the case of disyllables and heavy monosyllables, the latter of which clash with the root and are lost. PDM, on the other hand, has no restrictions on minimal wordhood, so degenerate feet are stressed if they are independent words (or even independent stems). Interestingly, in compounds, a monomoraic foot is parsed on each independent sub-element (cf. *wa.rì.ja.-tʃé* 'town-folk' vs. **wa.ri.já.-tʃe*), while in the case of inflected verbs monomoraic suffixal material following stem-stress cannot take stress (cf. *a.mú.-j-u* 'go-ind.1-d vs. **a.mù.jú*).

As regards culminativity, as defined in terms of 8.1b, Early English and Mapudungun differ quite substantially. While a single primary stress in OE and ME is always clearly singled out, Mapudungun seems only to emphasise prominence hierarchies where there is clash within the word, and even then, the process can be gradient. The prominence relations in the Amerindian language, however, are complex in nature, showing effects of cyclicity (in particular for derived verb-stems §4.3.2) and of morphosyntactic conditioning (for compounds §4.2.4.1). Interestingly, the way we have set out our analysis for PDM, when clash-resolution occurs at the lexical level – promoting a stem-extension – it creates a categorically culminative stress (cf. 4.3.2), while in its post lexical application, it creates gradient culminativity (cf. 4.5.2).

Importantly, the question of culminativity is traditionally related quite directly to the issue of the demarcative function of stress, particularly in 'fixed stress' languages, that is, in languages where the position of stress is predicted from the edge of a morphological domain. In other words, the fact that morphemes or words reliably contain a single stress in a particular position helps to identify or parse that morpheme or word. The emphasis on culminativity in PDM clash-resolution can hence also be explained in relation to demarcation. A sequence of syllables stressed to the same degree fail

to provide much information for the two relevant morphological domains that attract stress: the word and the stem.

Positional prominence: The distinction between stressed and unstressed syllables is typically considered to affect the number and types of contrasts that are possible at a segmental level, as well as their strength/weakness (cf. Gordon 2011a: for a review of possible stress-related segmental alternation). Although some of these differences are, no doubt, better viewed as effects of foot-structure rather than stress *per se* (Gordon 2011a: 936), it appears that they are not a universal requirement of stress systems (cf. the difference between dominant and non-dominant accent languages in van Coetsem 1996).

A cursory look at any grammar of English will reveal the distinction between stressed and unstressed syllables as regards the quality of both vowels and consonants to be key at any given stage of the language's history. Furthermore, viewed diachronically, positional prominence and non-prominence play a role in the vast majority of changes within the language's phonology (cf. West Germanic gemination, Anglo-Frisian brightening, umlauting, vowel reduction, final vowel deletion, among many others).

In Mapudungun we find no clear indication of such head-dependant asymmetries at a phonological level (cf. Dresher & van der Hulst 1998), either synchronic or diachronically. Word-final vowel devoicing and loss does appear to occur following voiceless obstruents, as well as occasionally after voiced ones (cf. Sadowsky et al. 2013: 94), but only where it conveys no clear morphological function (cf. /ˈɲa̱.t͡ʃɪ/ 'spiced, coagulated blood' > [ˈɲa̱.t͡ʃɪ̥] > [ˈɲa̱t͡ʃ]; /ˈkö.z̨ə/ 'soup' > [ˈkö.z̨ɨ̥] > [ˈköz̨], Sadowsky et al. 2013). As the phenomenon is restricted to the word edge, we suggest that the process is most likely a low level phonetic one interacting with the PrWd domain, rather than

necessarily with the metrical structure of the language.

The differences in vowel qualities reported by Sadowsky et al. (2013, see §1.2.1.1) for stressed and unstressed positions are also difficult to reconcile with positional prominence phenomena. There appears to be no clear increase in the inventory of vowels, and no clear sense in which we may say that stressed vowels are 'stronger' than unstressed ones.[7] For the case of epenthetic [ɨ] ∼ [ə] we do not consider the alternation in quality (and with [Ø]) a foot- or stress-based phenomenon, as it appears to occur, by and large, at the post-lexical level, after footing and stress assignment have taken place (cf. §4.3.5.3 and §5.5.3).

Demarcation: On the functional side, it has long been remarked that 'stress at morpheme edges functions as a signal for these morphemes, and thus facilitates lexical identification of morphemes in processing' (Kager 2007: 245). As we have seen, this feature of a language's stress does not contradict the 'formal' or 'metrical' ones outlined above. As a matter of fact, the stress system of OE and its Germanic antecedents appear to exploit the metrical aspects of the language while, at the same time, giving clear word or stem demarcation through initial stress (cf. §6.1.3).

In the case of Mapudungun, however, the emphasis on the demarcative function is much more ambitious, attempting not only to mark word boundaries, but also stem boundaries. This type of language shows some incompatibility, in particular, with a predominantly rhythmic stress assignment, a point made by Hayes:

> 'In a rhythmic stress system, stress is based on purely phonological factors, such as syllable weights or limitations on the distance between stresses and between stress and word boundaries. In a morphological system, stress serves

[7] The data in Sadowsky et al. (2013) points towards the stressed variants being more open than those in unstressed syllables, which, considering the given inventory, means that, overall, the vowel system is less peripheral in the case of stress than in the case of no-stress.

to elucidate the morphological structure of the word.' (1995: 31-2)

Table 8.1: Summary of structural differences and similarities

	Early English	**Mapudungun**
MORPHOLOGY		
Fusional/Agglutinating	Mostly fusional.	Mostly agglutinating.
Analytical/ Synthetic	Synthetic (in analytic drift).	Polysynthetic (some attrition).
Suffixing/ Prefixing	Suffixing.	Suffixing.
STRESS		
Rhythm	Iterative footing.	No clear iteration.
Culminativity	One and only one main stress.	At least one main stress, often unclear stress-hierarchy in the PRWD.
Positional prominence	Important effects, both synchronic and diachronic.	No clear effects in the phonology.
Demarcation	Initial stress marks PRWD boundaries.	Penultimate-mora stress marks PRWD and STEM boundaries.

8.1.3 Data differences and similarities

As de Lacy (forthcoming) makes plain, in particular with relation to Mapudungun, evidence for stress and prosodic structure in a language must overcome a number of difficulties if it is to be used unequivocally within a generative framework. Some of these challenges include the theoretical framework the data-gathering was couched in, the quality and quantity of sources, the non-uniformity of acoustic cues, and the influence of bilingualism, dialectal variation, speech impairment and a number of other variables. These challenges are especially manifest for the case where stress is not phonemic (Mapudungun), or only marginally so (English). Non-contrastive stress, furthermore,

usually does not find its way into a language's writing system, and phrase-level stress adjustments often escape the native speaker's awareness.

Dealing with historical data for prosodic structure presents additional challenges. As we rarely have access to good quality audio material for significantly earlier stages of a language, we are forced to trust the written descriptions given by contemporaries of the stage, either through their explicit accounts and transcriptions, or through evidence in the phonotactics, the organisation of syllables in words and in verses, and the different diachronic paths of stressed and unstressed syllables.

The evidence for stress in Early English – which was not marked in writing – is derived both from sound changes' different effects on stressed and unstressed syllables (Campbell 1959, Hogg 1992b, Lass 1992, Minkova & Stockwell 2008), and from metrical and alliterative practices in early texts (Sievers 1893 Russom 1998, Minkova 2003). On the basis of this evidence, it is reconstructed that syllables could either bear primary (main), secondary (half), or no stress at all (McCully & Hogg 1990: 316, Lass 1992: 83).

This practice is relatively conventional and yields the patterns of stem-initial stress alternating with prefixal stress which we have examined in §7.5. We have furthermore been somewhat speculative in ascribing stress to prefixes which, though non-alliterating, constitute minimal words by virtue of being minimally bimoraic (cf. §7.6). This assumption is a reasonable one, considering the general characteristics of the stress system of the language and the developments we find in stressed and unstressed syllables.

The fact that English presents metrically-dependant verbal art, as well as clear differences in the diachrony of stressed and unstressed syllables, makes the reconstruction of earlier stages of the language a relatively certain matter. This is even the case for the reconstructed position of secondary stress, as we argued for in §7.5.1.3. It is precisely

this type of asymmetry in the diachrony of stressed and unstressed syllables which led van Coetsem (1996) to place English at the pinnacle of what he calls dominant accent (D) systems, as opposed to languages that do not display such radical asymmetries, being termed non-dominant (ND), examples of this being Finnish or French.

For the case of Mapudungun, we have had to deal both with contemporary (Chapter 3) and historical stress data (Chapter 5). Lack of clear consensus in the literature on contemporary stress (cf. Chapter 2) led us to conduct original fieldwork on the topic, which entailed recording samples, paired to native-speaker intuitions. Native intuitions were relatively easy to gather, in particular due to the fact that speakers were all bilingual in Spanish, where stress plays an important morphological function.

The intuition-results showed a clear pattern for monomorphemes stressing a penultimate mora, except for the case of vowel-final disyllables, which were stressed alternatively on either syllable, with no clear conditioning factor. This variability was seen to be consistent with the major cue for stress in the language (higher nuclear pitch maxima in the tonic syllable). This variability, and the fact that all interviewees were Mapudungun-Spanish bilinguals, raised some suspicion regarding native intuitions. To counter these, native speaker percepts were contrasted with those of speakers of different languages having no exposure to Mapudungun. The results were consistent for non-native speakers overall. Furthermore, Spanish speakers were not noticeably better at the task. These results were taken to suggest that the native intuitions were both robust and independent from Spanish in the bilingual speakers' grammars.

Whether or not these somewhat idiosyncratic techniques are fully dependable, the fact that we have need of them shows that the issue of stress-positioning in Mapudungun is less obvious than in English. In this sense, Mapudungun would clearly fall in with the Coetsem's ND type languages, lacking many of the phonological cues related to segmental and phonotactic reduction in unstressed syllables and enhancement of

contrasts in the stressed ones (cf. 402).

This absence of phonological distinctions at the segmental level between stressed and unstressed syllables can easily be projected back to all attested stages of the language. Since no stress marking is given in the grammars until the turn of the century (and then very sporadically), the major source of data are the accounts of missionaries. Here, no distinction is made between the phonotactic structure of stressed and unstressed syllables, and no versification rules appear to rely on prosodic structure. Despite this, the high accuracy of results for non-native perception of PDM stress gives some further credibility to these early accounts by non-native speakers.

The descriptions for earlier stages of Mapudungun, however, differ in the level of detail they provide, thus leaving at least some of the details up to our own inferencing. What is made clear by most accounts is that the stated rules allow for some variability, and stress has less force in the language than in those the grammarians are familiar with (Spanish, Latin, Catalan and German, for the most part). This fact, along with findings regarding the actual position of stress lead us to believe that the absence of clear culminativity we find in the later stages of the language (particularly in our own data) can be extended to the entire historical period.

In sum, then, Early English and historical Mapudungun show very disparate manifestations of their stress and prosodic structure. Where the history of English evidences the position of stress in verse, as well as in synchronic and diachronic positional asymmetries, Mapudungun gives none of these cues, either today or in its historical development. Nonetheless, both native and non-native speakers appear to clearly identify Mapudungun stress as such, even if there is little clarity as to the hierarchies of word-internal stresses. It may be claimed that, as regards the stress-system itself, Mapudungun prosodic structure is obvious and pertinent. In what follows, it is argued that these facts regarding the languages' stress systems are related to the role they

plays within the general structure of the language.

8.2 Stress vs. morphological structure

We have seen, then, that Mapudungun and English, though both predominantly suffixing, differ in most other morphological parameters. Particularly important is the issue of the agglutinating nature of most Mapudungun morphology as opposed to Early English's mostly fusional (and progressively isolating) structure. With regards to stress, there is also a clear difference in the two languages: while OE and EM emphasise rhythmic organisation, word-level culminativity, positional asymmetries and phrase-level demarcation, Mapudungun focuses predominantly on word-internal and phrasal demarcation.

8.2.1 Does Mapudungun 'care' about stress?

More generally, we have noted that English may be considered a dominant accent system *par excellence* in van Coetsem's typology (1996), while Mapudungun would most likely fall in with the opposite, non-dominant pattern. With Hyman forthcoming we may even say that English belongs among those languages that 'care' very strongly about stress, while Mapudungun belongs among those which do so to a much lesser degree.

> 'Languages which exploit metrical structure for multiple purposes... will exhibit the kind of "metrical coherence" found in Germanic (Dresher & Lahiri 1991), ... Languages such as Hungarian or Turkish ... seem different because their metrical structure has little or no relevance outside the stress system itself. The contrast with English, whose phonology cares so much about stress, is quite striking. At the other extreme, Bella Coola cares so little that we

can't even determine if it has word stress at all.'(Hyman forthcoming: §2)

Placing Mapudungun at the opposite extreme from English in the scale of 'stress-centredness' and 'stress-indifference' seems rather hasty, however. While the metrical structure of Mapudungun has 'little or no relevance' to the phonological structure of the language, it does have other, broader effects 'outside the system itself', in particular, with relation to the morphosyntax of the language. The demarcative function of stress in Mapudungun, which we have emphasised here, seems to 'care' very strongly about its position and perceptibility. The signalling of morphosyntactic compound heads in PDM, and the marking of stem- and word-edges across the language's history, seem to argue precisely this point.

Furthermore, according to our analysis, Mapudungun cannot be said to lack 'metrical coherence' altogether. On the contrary, we have claimed that the same types of structures and rules are required throughout the grammar of PDM, with different surface effects (e.g. footing of moraic trochees and their interaction with initial extrametricality and NO CLASH). What does seem clear is that Mapudungun does not have the same tendency to perpetuate the synchronic coherency of the prosodic structure as, for example, Early English.

8.2.2 Morphological and prosodic parsing in fusional and agglutinating languages

One of the key issues in order to understand the diachronic development of Mapudungun and English morphoprosody has to do with the relative importance of morphological and prosodic parsing in the two languages. While it should by now be relatively clear that the Amerindian language prioritises the morphological structure over the prosodic, and that the Indo-European one privileges the opposite relation, the reasons

behind these hierarchies must be examined in more detail.

The fact that OE morphology is fusional means that its inflectional suffixes display widespread allomorphy as regards the individual elements of information they convey. For instance, there is no common phonological form to represent the shared number and gender we find in the forms *āðeling-as* 'prince-MASC.ACC.P' and *āðeling-um* 'prince-MASC.DAT.P. Since the notions of plurality and masculinity cannot be abstracted from individual elements across the paradigm, this might be viewed as a missed chance to facilitate morphological parsing and reduce the amount of stored forms in the language. However, the complete substitution of one inflectional form for another means that from a prosodic perspective, the phonological material need not be strung together online, but that it can be assigned in bulk, with a certain amount of structure pre-assigned. This state of affairs is reminiscent of the patterns that are invoked in theories of Prosodic Morphology, in particular regarding phenomena such as reduplication and root-and-pattern morphology (cf. McCarthy & Prince 1986, 1990; Downing 2006).

Early English, as most inflecting languages, tends to make use of affixes that are full syllables in their own right.[8] Thus, typical OE prefixes and suffixes are made up of at least one vowel. As a matter of fact, since there appears to be no resyllabification at the prefix-root boundary (cf. Minkova 2008: 28), the weight of the added syllables is pre-defined in the stored representation of the affix, thus allowing the speaker to quickly and unequivocally calculate its position within the prosodic structure of the word.

The case of Mapudungun inflection is, of course, diametrically opposed. The agglutinating nature of the language, and the fact that most inflectional morphemes are made up of a single consonantal or syllabically underspecified segment (cf. §3.4.1.1

[8]The fact that PDE's inflectional system relies on non-syllabic suffixes (cf. [-s]∼[-z] in the nominal plurals, the genitive, and the 3rd singular of the present tense and preterite [-t]∼[-d] forms) is further evidence for its departure from a fully-fledged inflectional system.

3.18), makes the question of assigning prosodic structure much less of a foregone conclusion. Recall that the OFI alone (p. 120) can surface as anything from two syllables to a single coda glide (cf. *kon-i-m-i* 'enter-ind-2-s' and *ʈ̣ipa-j* 'exit-ind.3s'), and that much of this structure depends on the preceding segment's syllabic or non-syllabic nature.

In short, it seems clear that Mapudungun inflection can rarely be added as a predetermined prosodic unit or series thereof. It appears, rather, that the actual prosodic shape of inflectional material must be computed online in the process of word-building. The result, evidently, is a much less clear-cut system as regards the rhythmic and hierarchical organisation of stresses. Although the position of stress is predictable, it seems to be computed much more locally, at morphological boundaries.

From the perspective of positional prominence asymmetries, the same morphologically-based argumentation may be undertaken. While the information contained within a single fusional morpheme is not phonologically related to other elements in the paradigm, non-prominece effects – such as reduction – do not directly affect the retrievability of the meaning of the morpheme. Furthermore, such reduction processes tend to occur for the same suffixal material in all words, since they not only occupy the same morphological position, but also the same prosodic one.

However, what may – and does – occur in Early English, is the phonological merger of inflectional suffixes as a result of reduction in the weak branch of a foot (cf. §6.1.3). Ultimately, of course, this did have the effect of breaking down the language's inflectional system. The key here is that reduction failed to keep inflectional suffixes *distinct* from one another. This was possible, among other things, because there was no need to keep parts of the inflection phonologically *the same* as other elements in the paradigm, phonological elements having no one-to-one mapping to meanings.

The agglutinating structure of Mapudungun, in contrast, does require this match-

ing of the segmental structure of inflectional elements in one part of the paradigm to those in another. In this sense, positional asymmetries are much less likely, as any change in one part of the paradigm could make the general inflectional system irretrievable overall. This is particularly the case as the same morpheme may appear in different prosodic positions depending on the surrounding morphology. With reference to Optimality Theory, it may be held that faithfulness constraints for the phonological identity of morphemes are much stronger in Mapudungun than in English.

Overall, then, we may say that Morphological types constrain the instantiation of the different possible roles we find for stress in languages. While in a fusional language like Early English a morpheme is also a clear prosodic unit, in an agglutinating tongue like Mapudungun – especially one which allows sub-syllabic morphemes – each morpheme must be parsed online by the prosodic system. As a result, the phonological structure of the morpheme before prosodification is of little import to fusional morphemes, while it is key to agglutinating ones. The imposition of rhythm, culminativity or positional asymmetries on the latter type of morpheme is, therefore, much more restricted than on the former.

Although the scope of this study is too restricted to provide extensive grounding for a rigorous typological claim, it would seem that there is at least a logical correspondence between the priority of prosodic parsing and fusional morphology as opposed to the priority of morphological parsing and agglutinating morphology. In fact, a quick look at the languages that Hyman (forthcoming: §2) – in the quote in §8.2.1 – mentions as 'caring' very little or not at all about stress outside the stress-system itself, shows them all to fall within the agglutinating spectrum.

Hungarian, which is predominantly suffixing and has a range of sub-syllabic morphemes (Kenesei et al. 1998), places main stress on the initial syllable of words (Varga 1994), hence avoiding its interaction with the bulk of morphological alternation. Sec-

ondary stress, on the other hand, does interact with suffixation, its position being somewhat controversial. The default position for secondary stress has alternatively been claimed to involve quantity sensitivity (Szinnyei 1912), tertiary stress (Hammond 1987), rhythmic re-adjustment (Varga 1994) and alternating left-right syllabic trochees (Hayes 1995: 330, see van der Hulst 1999a: 452 for a brief review). Recent research (Varga 2002; Blaho & Szeredi 2011), however, tends to find that the position of the secondary stresses is either partially or predominantly morpho-syntactically governed.

Although stress in Turkish has been a matter of some debate in the literature, especially as regards the 'special' stress rule for borrowed proper names, and the theoretical implications of the system overall (cf. Baker 1989; Inkelas & Orgun 1998; Inkelas 1999; Vogel 2001) the default stress position seems relatively straightforward, falling on the final syllable. Although the situation for Turkish is slightly different from that of Mapudungun and Hungarian in that suffixes are always minimally monosyllabic, the main position of stress seems to be clearly demarcative at the phrase-level (it marks the end of the word).

The major exceptions to the main Turkish stress-rule are related to the presence of 'special' morphemes which have been taken to be lexically stressed, or to mark important morphological breaks (cf. Baker 1989). In other words, the morpho-syntactic component undoubtedly plays a major role in the position of stress, a point on which all accounts agree. On the phonological/phonetic side, the only cue to stress – much as in Mapudungun – is pitch (Levi 2005), however, there seem to be no properly phonological cues or effects of stress outside these low-level phonetic ones, or as Hyman (forthcoming: §2) points out: 'not a single rule or constraint refers to it'.

In the light of the dependence on stress that Germanic languages display in dealing with assimilatory phenomena such as umlauting, it is also surprising that neither Hungarian nor Turkish vowel harmony interact with stress. Again, this may be taken

as evidence for the fact that agglutinating languages seem to display fewer positional asymmetries than fusional ones. A further implication might be that stress is more of a local, edge-bound phenomenon, having little influence on the entire domain it belongs to.

Finally, Bella Coola or, more properly Nuxálk (the endonym), a critically endangered language spoken in British Columbia, gives little evidence for prominence phenomena, or even for syllables in any traditional sense (cf. Newman 1947; Nater 1984). The main difficulty here is that the language – as other Salishan languages – typically displays extensive, unbroken sequences of consonants (often just obstruents) which may be coextensive with a morpho-syntactic word. The fact that morphemes – and words for that matter – have no minimal syllabic structure, is obviously a limitation for assigning stress (or any other word-accent) in the language. Ultimately, it would seem that in a language like Nuxálk, faithfulness to morphological structure does not allow for prosodic structure to have much incidence at all on the linguistic system.

Coming back to Mapudungun and Early English, differences in the morphology of the two languages seem to have an effect on the role stress plays in the system overall and, ultimately in the diachrony of the language. In cases where stresses fall together over time, producing patterns of clash or conflation, we find the two languages 'react' quite differently. Mapudungun demonstrates the pertinacity of morphological structure. As a result, changes in weight-sensitivity and functional reassignment of stress to relevant morphological boundaries (cf §5.5.2) are documented diachronically. English, in contrast, demonstrates the pertinacity of prosodic structure, privileging stress' formal role to the detriment of morphological patterns. This tendency has been shown to reach its extreme in clashes across the prefix-root boundary, which triggered the loss and lexicalisation of offending prefixes in EME (cf. §7.6).

8.2.3 The myth of Araucanian iterativity and primary stress

Under the name 'Araucanian', Mapudungun's main claim to fame in the phonological literature is that it purportedly provides evidence for a quantity-insensitive iamb footed from left to right, with main stress at the left edge. Analyses to this effect are all based on Echeverría & Contreras (1965), which itself strongly suggest this interpretation by claiming that in the language 'a phonological word has main stress on the second syllable and, if applicable, secondary stresses on the fourth and sixth syllables' (134). Although accounts vary in terms of the acceptability of this pattern as a quantity insensitive iamb (see §2.4), the existence of iterativity and culminativity are taken as given, even when both issues are presented as highly suspect in Echeverría (1964), a more extensive account of the same data.

Of course, both the iterative and culminative interpretations are intuitively very appealing. There is no doubt that human cognition is adept at overlaying recurring patterns on perceptual input, as has been shown time and again for the organisation of stimuli into 'iambic' or 'trochaic' patterns depending on their contrast in terms of length or intensity, both in auditory (Bolton 1894; Bell 1977; Bion et al. 2011) and visual stimuli (Peña et al. 2011). Crucially, however, despite the fact that language relies on these types of general cognitive tendencies, it is also able to override them in order to use prominences to convey information, as in the case of demarcation.

It is furthermore the case that the word, as a morphosyntactic unit, plays a crucial part in the organisation of most linguistic systems and, therefore, we might expect that the domain of the word should be clearly singled out through the uniqueness of main stress. However, if the main trait of a polysynthetic language is, precisely, its blurring of the distinction between the word and the phrase, making a phrase the ideal word (cf. §1.2.2.1), it is not surprising that a language of this type may fail to signal wordhood so prominently, utilising the maximisation of stress as a functional or communicative

device.

In sum then, the view of Mapudungun stress presented here does not take issue with the typological claim regarding the existence of quantity-insensitive iambs,[9] though the evidence points to a trochaic pattern best describing the contemporary and historical data for Mapudungun. The more problematic issues relate to more basic claims such as that regarding the position (or existence) or main stress, and the related issue of the existence of iterativity in Mapudungun stress overall. The key finding to this effect is that previous accounts have not taken morphological structure into account to the appropriate degree. As a result these studies – in particular E&C – have imposed phonological parsing on a language in which morphological parsing takes precedence over prosody.

8.3 What is stress for?

The two case studies presented in the preceding chapters provide evidence for the synchronic and diachronic relationship between prosodic and morphological structure. Although we have found a number of similarities between the organisation of the two languages, we have also found that the typological profile of their morphology seems to affect the role that prosody is able to play in their overall system.

Among their similarities, we find that both languages display forms of synchronic 'metrical coherence' (cf. Dresher & Lahiri 1991). While the earlier stages of English and its Germanic predecessors show a number of phonological processes that are dependant on the metrical structure (Dresher & Lahiri 1991; Lahiri & Dresher 1999; Lahiri & Fikkert 1999), PDM appears to show coherence in the stress-assignment system alone, applying the same type of footing and edge-restrictions to all domains. In this sense,

[9] See fn. 19 on page 208 regarding other languages that may fall into this category.

our analysis follows a 'weak' version of 'metrical coherence' for both languages, that is, one which at least for the synchronic stress-system we find the following statement to be true:

> 'a phonological system in which a number of different rules relate to the same metrical structure is more constrained and easier to learn than one in which each rule is on its own. (Dresher & Lahiri 1991: 283)

From a diachronic standpoint, furthermore, we find that both languages' prosodic and morphological systems are notably resilient in the face of heavy lexical borrowing. In other words, although they display changes in their prosodic and morphological organisation, these are not fickle, fair-weather changes taken from the patterns of an incoming language, but rather respond mostly to language-internal processes. Although in both cases there is a tipping point where more substantial changes do enter the language from outside, these are mostly either repair strategies related to internal processes, or the result of the overall waning of linguistic vitality as a result of quasi-universal bilingualism and language marginalisation.

The aspects where we do find differences between Mapudungun and Early English morphoprosody, we have argued, all stem from a fundamental distinction in the role of stress, which in turn, appears to be correlated – at least loosely – to the language's morphological type. In this sense, we find that the question that heads this section to be a valid one: What is stress for?

Of course, in posing such a question we do not intend to imply that teleology has a role within linguistic explanation but simply to highlight the fact that the speech signal has a number of attributes (such as those normally correlated to the perception of stress) which may come to be used to different ends. In a language like OE, stress and prosodic structure overall do not appear to have any one particular purpose, but rather act as an organising principle of the entire system. Key to this structural role

is the fact that it singles out words through the clear enforcement of culminativity and obligatoriness. This strong hierarchical organisation of the metrical system places restrictions on the structure of morphemes overall: as fusional elements, they act as prosodic units in their own right. The correlate to this structural/hierarchical organisation is rhythmicity, which brings with it a tendency for positional asymmetries. Early English can, consequently, easily be said to subscribe to a stronger version of 'metrical coherence' than Mapudungun.

> 'the various rules and processes that make up the phonology of a language are not a random collection drawn from a set of universal possibilities, but rather relate to the whole. This is especially so in the case of prosodic phenomena involving syllable structure, stress, and related processes, where it has been observed that various rules in diverse languages tend to conspire to achieve favoured patterns.' (Dresher & Lahiri 1991: 251)

Although there is no doubt that PDE continues to assign a strong structural role to stress, the changes in prefixation and stress described in Chapter 7 saw the rise of a new functional role for stress. The lexicalisation of a number of frequent prefix-root sequences in EME, meant that, although their morphological structure was lost, diverging stress-patterns remained for nouns as compared to verbs (cf. *wið-hőlden* vs. *óut-cast*). This alternation was reanalysed by ME learners as a diagnostic for word-category membership in incoming loans (cf.*torménten* vs. *tórment*), passing a form of contrastive stress on to PDE.

Although we have said that, at least in a synchronic sense, Mapudungun stress rules relate to a cohesive whole, we find that no further rules or diachronic processes attempt to optimise the prosodic structure laid out for the assignment of stress. It is clear, hence, that the role of stress and prosodic organisation in Mapudungun is not predominantly structural. The fact that the stress system is coherent internally and,

furthermore, consistently perceptible to native and non-native speakers means that it must have some relevance to the linguistic system overall.

For Mapudungun, then, the question of 'what stress is for' ought to do be answered by saying that stress plays a facilitating role in morphological parsing, highlighting word internal and phrasal boundaries through prominences. This functional role of stress is associated to the fact that the internal structure of polysynthetic languages is complex and needs to be spelt out. At the same time, the agglutinating, sub-syllabic morphemes of the language must be carefully parsed by the prosodic system in order for the phonological shape of each morpheme to be transparent within the general paradigm.

The key distinction between the two systems – the 'weak' and 'strong' versions of metrical coherence – in Mapudungun and Early English, seems to relate to the degree to which the prosodic structure upon which stress is assigned has been phonologised by the language as a whole. A fusional language has fewer restrictions regarding how far the prosodic structure can percolate into other phonological domains. A polysynthetic, agglutinating language, on the other hand, must maintain the link between the phonetic cues to prominence and the morphology, without becoming too phonologically entrenched.

Whether or not the properties of morphoprosodic interaction which we have observed for Mapudungun and English are extensible to other languages (as a type of implicational universal) is an empirical matter. However, the myriad uses that languages give to particular linguistic elements suggests that there will be some cases that subvert this apparently sensible means of organising grammars. More importantly, the correlation of morphological type to stress role argued for in the two case studies, provides evidence for the instantiation of a particular range of possibilities for these structures' interaction. As a result, this thesis' findings fall in with a 'properties-based'

typology of languages (cf. Hyman 2006, 2009) as well as the general approach to the study of languages suggested by (Evans & Levinson 2009). Here, the major goal in linguistic description is directed towards documenting the diversity of significant patterns and properties within human language, rather than imposing airtight universals upon its more intricate or unique manifestations.

Appendix A

Mapudungun fieldwork: materials and participant data

Although the fieldwork interviews included eight informants, one of the subjects was excluded since in the interview it was disclosed that he only learned the language as a young adult. We report on the remaining seven interviewees.

Here the procedure for data-gathering is described. The results for the background questionnaire and samples of the elicitation tasks are provided.

A.1 Interviewee background

The basic background data was gathered by the researcher following a questionnaire, with answers being given orally in Spanish.

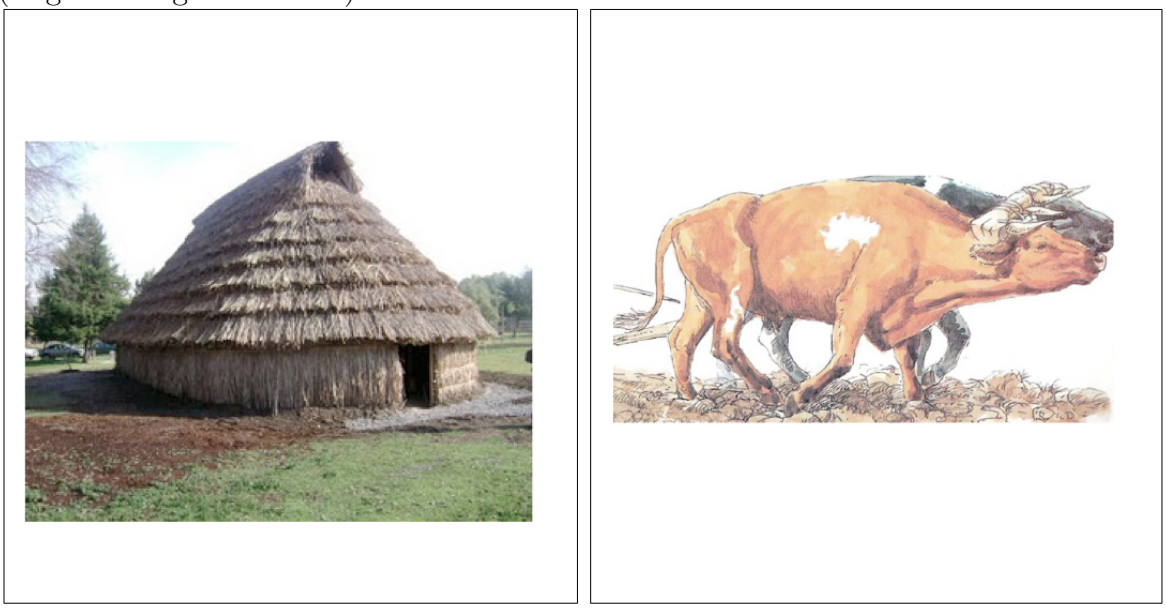
Table A.1: Interviewee background information

Initials	Gender	Age	Place of Birth	Writes Spanish	Learned PDM w/	Writes PDM	Uses PDM w/	Uses more Span/PDM	Hearing/ speech
AH	F	61	Los Boldos	Yes	Parents	No	Community members	Span	Unimpaired
CC	F	80	Dollinco	No	Parents	No	Husband, friends	PDM	Unimpaired
FG	M	59	Tromengelo	Yes	Parents	No	Neighbours, mother	Both	Unimpaired
JH	M	55	Dollinco	Yes	Mother	No	Elders ceremonies	PDM	Unimpaired
ML	M	64	Rucapangue	Yes	Parents	No	Elders	Span	Unimpaired
MLC	F	83	Rucapangue	Yes	Parents	No	Other Mapuche	Span	Unimpaired
SC	M	62	Capahue	Yes	Grandmother, community	Yes	Family Neighbours	Both	Unimpaired

A.2 Task A: Picture naming

The first elicitation task is interspersed with Task B, which was conducted immediately after each item. We present the tasks separately as each provides a different datum: the recorded word and the speaker intuition on its stress position. Task A was based on picture naming. Interviewees were presented images of culturally relevant objects in 10x10 cm flash-cards (such as the ones in Fig. A.1). They were asked to tell the researcher what was the main object depicted. These forms were recorded and matched to the speaker intuitions in Task B.

Figure A.1: Sample flashcards for the target words *ruka* 'house' and *mansun* 'ox' (original images in colour)



A.3 Task B: Stress discrimination

Although the procedure was already described in §3.2.1.1, we repeat it again here for easy reference.

Once a word was elicited in Task A, the speaker was asked if it was produced with initial or final stress, and whether it could be said with an alternate stress pattern. In this case, the interviewer (and sometimes the main informant as well) demonstrated the possible stress patterns:

(A.1) Sample stress discrimination task (B) for the noun *ruka* 'house':

Q: *¿Usted dijo 'rúka' o 'ruká'?* (Did you say *rúka* or *ruká*?)

A: *'rúka'* (*rúka*)

Q: *¿y es posible decir ruká?* (and is it possible to say *ruká*?)

A: *También se dice 'ruká'.* (*ruká* is also used.)

A.4 Task C: General knowledge questions

In this section, interviewees answered questions about their own general knowledge of the world or about specific information about their own lives. The objective was to elicit a number of nouns and verbs in varying morphosyntactic contexts (cf. §3.2.3).

The prompt question was always given by the main informant in Mapudungun, following the researcher's instructions. Interviewees were asked to answer the questions as fully as possible. They were told to answer the question as if the person hearing the answer had not heard the question (i.e. complete sentences). Although the prompts were originally constructed by the main researcher, they were modified with the help of the main informant, in order to make them more idiomatic and, in some cases, to correct mistakes making them ungrammatical or ambiguous.

(A.2) Sample general knowledge questions with sample answers

Q: *Tunten ʦipantu moŋe-j-m-i feytʃi mapu mew?*
how.much year live-IND-2-S this land POST
'How many years have you lived in this land?'

AH: *Kaju mari epu ʦipantu nie-n tufatʃi mapu mew.*
six ten two year have-IND.1S this land POST
'Sixty two years I have in this land'

Q: *Tʃem kuʦan nie-j=ŋɨn fenʦen tʃe pukem mew?*
What disease have-IND.3=PLURAL much person winter POST
'What disease do many people have in winter?'

SC: *Tʃafo-kuʦan nie-j=ŋɨn fenʦen tse pukem mew.*
Cough-disease have-IND-3=PLUR much person winter POST
'Many people have colds/coughs in the winter'

Q: *Inej piŋe-j tami ɲuke am?*
Who say-PASS-IND.3S your mother PARTICLE
'What was your mother called?'

JH: *Iɲtʃe taɲi ɲuke Antonia pi-ŋe-fu-j*
I my mother Antonia say-PASS-BI-IND.3
'My mother was called Antonia (while she lived)'

A.5 Task D: Picture-based questions

Much as in the previous task, interviewees were asked to answer a series of questions posed by the main informant in Mapudungun, according to the instructions given by the main researcher. In this case the objective was to target a slightly larger range of words using the flashcard images from Task A. In each case, the subjects were told that they would have to answer a question using the image in the flashcard as the key element in their reply. Seeing as how the target words depicted in the flashcard was familiar to them from Task A, speakers were able to give a relatively swift answer. Again, they were asked to give full sentences in doing so. As a result, answers had a somewhat formulaic flavour (cf. §4.5.2).

(A.3) Sample picture-based questions with answers (target answer words – given as a picture – are in parentheses)

Q: *Inej* *laŋ-ɨm-fi-j* *tʃi* *fiʌkuɲ?* *(ʈ̪ewa)*
Who die-CAUSE-DIR.3SP-IND.3S the lizard (dog)
'Who killed the lizard?'

JH: *fiʌkuɲ* *laŋ-ɨm-i-j* *ʈ̪ewa.*
lizard die-CAUSE-IND.3-S dog
'The dog killed the lizard'

Q: *tʃew* *ʈ̪eka-j=ŋɨn* *fatʃantɨ?* *(inaltu-l̪̈afkeɳ̈)*
Where walk-IND.3=PLUR today (edge-sea)
'Where are you walking today?'

SC: *Inaltu-l̪̈afkeɳ̈* *ʈ̪eka-j=ŋɨn* *fatʃantɨ.*
Edge-sea walk-IND.3=PLUR today
'They are going to the seaside today'

Q: *Inej* *elu-ɲma-fi-j* *tʃi* *mansun?* *(wenʈ̪u)*
Who give-APPL-IND.3SP-IND.3 the ox (man)
'Who gave him/her/them the ox?'

JH *Tufatʃi* *wenʈ̪u* *elu-ɲma-fi-j* *mansun* *eŋu.*
This man give-APPL-DIR.3SP-IND.3 ox DUAL
'This man gave the two of them an ox'

A.6 Task E: Translation of sentences

The final task entailed translating sentences from Spanish into Mapudungun. Relying on the fact that all interviewees were proficient speakers of Chilean Spanish, the researcher read out sentences in this language and requested a near translation into Mapudungun. As noted in §3.4.1.2 (p.143), the fact that identical sentences were presented for translation with minimal variations as regards person and number of the main verb, led to what appears to be contrastive focus stress on a final open syllable.

(A.4) Sample Spanish prompts and Mapudungun translations

Span: *Yo no tiro piedra-s al río.*
I NEG throw,PRES-IND-1S stone-P the river.
'I do not throw stones in the river'

JH: *Iɲtʃe iʈ̪ʂ̪if-la-ja-fi-n kura tufatʃi l̪ewfu mew.*
I throw-NEG-FUT-DIR.3SP-IND.1S stone this river POST
'I will not throw stones into this river'

Span: *Tú no dirás tu nombre.*
You$_S$ NEG say,FUT-IND-2S POS-2S name
'You$_S$ will not say your name'

FG: *Ejmi fey-pi-la-ja-j-m-i tami ɨj.*
You thus-say-NEG-FUT-IND-2-S POS-2S name.
'You$_S$ will not say your name'

Span: *Ustedes dos no dirán sus nombre-s.*
You two NEG say,FUT-IND-2P POS-2P name-P
'You two will not say your names'

FG: *Ejmɨn fey-pi-la-ja-j-m-ɨn tamɨn ɨj.*
You$_D$ thus-say-NEG-FUT-IND-2-D POS-2D name.
'You$_D$ will not say your name'

Appendix B

Mapudungun suffixes mentioned in this thesis

Alphabetical ordering: following Augusta (1916) (based on the Spanish ordering), ⟨ŋ⟩ is in the place of ⟨g⟩, ⟨θ⟩ is in the place of ⟨d⟩, ⟨ɲ⟩ comes after ⟨n⟩, and ⟨tʃ⟩ (elsewhere ⟨ch⟩) after ⟨b⟩.

Suffix	Gloss	meaning and references
-a	FUT	Future: The only clear tense marker in the language. Opposed to the unmarked form which is simply 'non-future' 130.
-am	PURP	Purpose or finality: A non-finite form of the verb found in subordinate clauses relating to finality or purpose of an action. The subject co-refers with that of the main clause, often through a posessive marker, cf. Salas 2006: 167-9, Zúñiga 2006b: 149.
-tʃi	IMP.1S	Portmanteau: An undecomposable inflectional suffix, cf. p. 118. The [i] element may be transparently equivalent to the singular marker. The final vowel is unstressed throughout the history of the language. This contrasts with the 2.IMP.S and 3.IMP.S forms, which were stressed in stages I and II (cf. pp. 236 and 259).

-θuam	DESID	DESIDERATIVE: Although earlier grammars (cf Valdivia 1606) consider this to be a 'desiderative' suffix, it seems that it can be more accurately characterised as the second element in a SVC (cf. AUG 'want, desire, need'). In this position (incorporated into another verb) it may be considered a grammaticalised aspectual suffix. According to Smeets (2008: 316): 'When *θuam-* 'to need, to want', *naɯɻ* 'to go down'... *tuku* 'to put at'... occur as the second element in a compound verb, they add aspectual meaning to the compound... The verbs *θuam-* 'to need, to want', *naɯɻ* are productive as aspectuals.'
-e	INV	INVERSE: The form marks an inverse argument structure (cf. p. 127). In combination with the suffix *-ew* it marks a 3rd person SP in the role of agent. Followed by *-n* or *-ju*, it indicates a 2nd person agent SP, with a 1S or 1D patient FP. Cf. Salas (2006: 109-119).
-el	NMLZ	NOMINALISER: This non-finite verb marker usually acts as the complement in a subordinate clause. Cf. (Salas 2006: 156-162), (Smeets 2008: 201) and p.126, above.
-(l)el	APPL	APPLICATIVE: A stem-extending suffix in the analysis of PDM, as well as a valency-augmenting suffix. Often referred to as a *benefactive*, it adds an additional argument in a transitive construction, which is often the beneficiary of the predication. Cf. Golluscio (2010), Zúñiga (2010) and p.134.
-ew	3SP	3RD PERSON SATELLITE: In combination with the inverse marker *-e*, the suffix marks the 3rd person satellite as the agent (cf. entry for *-e*).
-faʌ	CAUSE	CAUSATIVE: Though somewhat rare, Zúñiga (2006b: 176) considers the form to be a causative (cf. *θewma-faʌ-in* 'build-CAUSE-IND.1S'. Independently, however, Augusta (1903: 278) claims that the form may also be an adjectival one, e.g. *kuɲi-faʌ* 'care-ADJ', cf. p.62.
-fe	AGENT	AGENTIVE: Attaches to verbal roots in order to create nouns, cf. *wejtʃa-fe* 'fight-AGENT = warrior', p. 45.
-fi	DIR.3SP	3RD PERSON SATELLITE IN DIRECT FORMS: Marks the 3rd person in the patient role. Cf. p. 127.
-fu	BI	BROKEN IMPLICATURE OR ANTIPERFECTIVE: Marks events that are disassociated from the moment of speech. Cf. Golluscio (2000); Hasler (2009) and p. 128
-ŋe	IMP.2S	PORTMANTEAU: An undecomposable inflectional suffix. Cf. p. 118. Along with *pe* 'IMP.3S', the final vowel is not stressed in later stages of the history of the language (III and IV). This contrasts with the 2.IMP.S and 3.IMP.S forms, which were stressed in stages I and II (cf. §5.2.3 and §5.3.3).

-ŋe	PASS	PASSIVE: A stem-extending suffix in PDM, the passive suffix cannot explicitly state an agent, but is a stronger valency-reduction operation than in most IE languages. Cf. p. 133).
-i ∼*-j*	IND	INDICATIVE: Proposed as underlyingly underspecified for syllabic structure, i.e. ⟨I⟩ for PDM. Cf. Table 3.18 on page 120).
-i ∼*-j*	1	FIRST PERSON: Proposed as underlyingly underspecified for syllabic structure, i.e. ⟨I⟩ for PDM. Cf. Table 3.18 on page 120. At Stage II it is considered to be underlyingly non-syllabic (cf. p. 259).
-i ∼*-j*	S	SINGULAR: Proposed as underlyingly underspecified for syllabic structure, i.e. ⟨I⟩ for PDM. Cf. Table 3.18 on page 120).
-(ki)jaw	AMB	AMBULATIVE: Although Smeets (2008: 173) lists the suffix as a directional indicating 'circular movement', Zúñiga (2006b) claims that it has a less explicitly spatial meaning, falling in with other aspectuals with the meaning of a certain non-permanence of a continued action. Cf. *kɨθaw-kijaw-ij ɲi tʃaw mew* 'he is working for a stint at his father's'. Note that the first syllable *-ki* is claimed to be included only following a consonant, elsewhere the suffix surfaces as *-jaw*. Cf. examples (c) and (d) for 1.7 on p.41.
-jɨm	TEMP	TEMPORAL: The basic use of this non-finite verbal form is to indicate the temporal context within a subordinate clause: *θeo ikunu-jɨm eŋɨn* 'already having eaten...' (Salas 2006: 155, cf. Zúñiga 2006b: 148-149 as well).
-ka	CONT	CONTINUATIVE: Termed 'continuative' by Zúñiga (2006b: 162) and 'iterative' by Smeets (2008: 256), this form indicates that a certain state is still in effect, i.e. *mɨle-ka-j ruka mew* 's/he continues to be at home' (Salas 2006: 141).
-ke	HABIT	HABITUAL: This suffix indicates that a particular action or event is repeated at regular intervals, what Smeets (2008: 251) calls a 'constant feature of the subject', even though it may apply to non-subjects as well, cf. p. 131 and Salas (2006: 139).
-(ɨ)l	SUBJ	SUBJUNCTIVE: This is the 'conditional' mood in Augusta (1903) and Smeets (2008), though elsewhere it is termed 'subjunctive' or 'hypothetical'. For its functions see Salas (2006: 99-100) and for its distribution in paradigms see Table 3.18 on page 120)
-(ɨ)l	CAUSE	CAUSATIVE: One of the more common stem-extending suffixes in PDM. Cf. Golluscio (2010), p. 137.
-la	NEG	NEGATIVE: In the indicative, the negation of the predication is brought about through this suffix. Cf. p. 130.

-(kɨ)le	PROG	PROGRESSIVE: Although Smeets (2008: 280) labels the form as 'stative', this appears to be the csae only for telic verbs, which Zúñiga (2006b: 160) calls 'resultatives'. In the case of verbs with atelic aktionsart, the progressive meaning seems clearer, indicating an action in process. Cf. p. 136.
-lu	SVN	SUBJECTIVE VERBAL NOUN: One of the main non-finite verbal markers. It usually modifies the subject of the main clause (Smeets 2008), having an adverbial meaning which answers the question *why?* or *what for?* with regards to the main clause's predication. Cf.Salas (2006: 151-155) and Zúñiga (2006b: 146-148), as well as p. 126.
-m	2	SECOND PERSON: Marks one of Mapudungun's three grammatical persons, cf. Table 3.18 on page 120
-(ɨ)m	CAUSE	CAUSATIVE: One of the stem-extending suffixes of PDM. It is not fully productive, as other causatives in the language (Golluscio 2007). It also triggers root-allomorphy, as seen in Table 3.20 on page 137.
-(ɨɲ)ma	APPL	APPLICATIVE: A stem-extending suffix in the analysis of PDM, as well as a valency-augmenting suffix. Added to transitive verbs it requires a new non-agentive suffix in the clause, cf. Golluscio (2010); Zúñiga (2010) as well as p.134
-(ɲ)ma	TR	TRANSITIVISER: Also a stem-extending suffix in PDM. It augments intransitives' valency so that they are transitive. The agent, however, is demoted in favour of a new FP, cf. p.135.
-me	AND	ANDATIVE: This suffix implies movement away or back from the location of the speech act. Cf. Zúñiga (2006b: 170), Salas (2006: 142) and p. 133.
-mu	INV	INVERSE MARKER: The form marks an inverse argument structure (cf. p. 127). It marks a 2rd person SP in the role of agent where the patient FP is a 1S, 1D or 1P. Cf. Salas (2006: 109-119).
-mum	SITU	SITUATOR: This form creates a non-finite verb that is used in subordinate clauses to convey the location of events or actions of the main clause (Salas 2006: 169-170). According to Zúñiga (2006b: 150), *-mum* has a similar function to *-am*, although without the 'finality' component.
-(ɨ)n	INF	INFINITIVE: This is the principal non-finite form of the verb, functioning in much the same way as the PDE present participle *-ing*, creating verbal nouns, adjectives and adverbials. Cf. p.126 and Zúñiga 2006b: 141-3.

-(ɨ)n	P	PLURAL: In alternation with *-ɲ* after [i], the suffix marks the plural in the 1st and 2nd persons, and is likely decomposable as well in the plural clitic particle attaching to the 3rd person. Cf. Table 3.18 on page 120.
-(ɨ)n	IND.1S	PORTMANTEAU: Undecomposable inflectional suffix. Cf. p. 118.
-no	NEG	NEGATIVE: Marks the negative form of the subjunctive and of non-finite verbs. It may alternate with *-nu*.
-pa	CIS	CISLOCATIVE: Marks events occurring near the place of the speech event. Cf. Zúñiga (2006b: 169-70) and p. 133.
-pe	IMP.3S	PORTMANTEAU: An undecomposable inflectional suffix, cf. p. 118 and the entry for *-ɲe* -IMP.2S.
-pe	PX	PROXIMITY/VALIDITY: A stem-extending suffix in PDM. It marks an event as occurring near to the speaker (Smeets 2008: 247-51). It may also be used as a general evidential (Golluscio 2000: 252). It is likely diachronically a grammaticalised form of the verb-root *pe-* 'to see'. Cf. p. 131.
-pu	TRLOC	TRANSLOCATIVE: Marks events occurring far from the place of the speech event. Cf. Zúñiga (2006b: 169-70) and p. 133.
-tu	REST	REPETITIVE/RESTORATIVE: The suffix adds the meaning of either doing the verb's action for a second time, or of returning something to its original state. Cf. Salas (2006: 145), Smeets (2008: 254) and p. 132.
-tu	VB	VERBALISER: Added to a nominal or adjectival root, this suffix derives verbs (Smeets 2008: 126).
-tu	TR	TRANSITIVISER: This form adds an additional SP argument to an intransitive forms. This form is usually a patient (Smeets 2008: 297).
-tuku	ASP	ASPECTUAL: As in the case of *-θuam*, most likely a grammaticalised second element of an SVC with an aspectual meaning such as 'inward movement' (Smeets 2008: 319). The original meaning of the verb in Augusta (1916) is 'to place (in), put, wear'.
-rke	REP	REPORTATIVE: 'indicates that the denoted situation has not been witnessed by the speaker himself' (Smeets 2008: 246).
-u	D	DUAL: Regular, decomposible inflectional marker, cf. Table 3.18 on page 120.
-ufaluw	SIM	SIMULATIVE: The form adds the meaning of simulation to the action or state described by the root, Zúñiga (cf. 2006b: 139) and Smeets (2008: 264-6).
-uje	PERF	PERFECTIVE: has the meaning of an action being completed at the moment of speech (Salas 2006: 141. 171).

-(u)w	REFLEX	REFLEXIVE: In singular forms, this suffix adds the meaning of the action referring back to the agent. In the case of dual and plural agents, it refers to the action occurring among them, Salas (cf. 2006: 119-20) and Zúñiga (2006b: 122).
-we	INS	INSTRUMENTAL: Added to nouns and verbs, it creates either place-designations (cf. *miƛ'a-we* 'gold-INS/gold deposit') or instruments (cf. *lepɨ-we* 'sweep-INS/broom'), Salas (cf. 2006: 85-6), Zúñiga (2006b: 87-8) and §1.2.2.2.
-we	PSIST	PERSISTENCE: The suffix indicates a situation which persists after a previous event has taken place, Smeets (2008: 260). Cf. 2.14b on p. 61.

Appendix C

Old and Middle English corpus texts: King Alfred and Chaucer's *Boethius*

C.1 Old English: King Alfred's Boethius

The OE version, which is attributed to King Alfred himself (reigned 871-899; but see Godden & Irvine 2009: 140-5, for authorship), is likely to date from the very last years of the ninth century (894-9 is suggested by Godden & Irvine 2009: 145). From the standpoint of the dialectal variations of OE, the text can be characterised as early West-Saxon, as compared to the late West-Saxon literary standard that developed towards the end of the tenth century and prevailed until the Norman Conquest (Toon 1992: 426). Nevertheless, Godden & Irvine (2009: 153) consider the language of the most complete extant manuscript – British Library Cotton Otho A.vi (referred to as C) – to show very definite influence from the standard, hence suggesting a date of copy later than 900 but before 970.

The edition of the work that is used for this study is Sedgefield's (1899), which draws mostly from a detailed examination of manuscript C, but is also supplemented by the other extant manuscripts and the tradition of edition and commentary that precedes him (Godden & Irvine 2009: 220). Although there is now a much more detailed and accurate version of the major manuscripts, available in Godden and Irvine's recent edition (2009), unfortunately, being published only in printed form, this new edition was not amenable to electronic cross-searches. When further detail was needed, or ambiguity arose in Sedgefield's text, the new edition was consulted.

The prose text, which was the only part used for this study, is approximately 12,000 words long. The *metra*, which are also found in the C manuscript and are gathered in the second half of Sedgefield's edition, were excluded from the searches, since they are not versified in Chaucer's translation, making comparison more difficult. Another reason for this decision is that verse is considered a 'deliberate' use of language which would have been considered by OE speakers as 'a distinct kind of linguistic experience' (Godden 1992: 495), and hence likely to represent actual spoken language less faithfully. This is particularly relevant when searching for indications of morphological productivity, since poetry is considered specifically "suspect" in this regard (Bauer 2001: 57).

C.2 Middle English: Chaucer's Boece

The ME version of *De Consolatione Philosophiæ* on which this study is based is Chaucer's *Boece*, a prose rendition of the original Latin prose and *metra* . Although we lack a precise date for the translation, based on external references to the work, as well as the influence it had on the rest of Chaucer's own work, Benson (2008: xxv) places it in the early 1380s, during the author's traditionally designated 'Italian period', before

the composition of the *General Prologue* and the bulk of the *Canterbury Tales*.

In terms of its language, Chaucer's translation carefully follows the original, to the point of being called 'strictly literal' by Samuel Johnson (Hanna & Traugott 2008: 396). However, the text also shows care in representing both the solemnity of the work and the sophistication of its philosophical terms, by careful choice of words and the use of vocabulary not attested elsewhere in the Chaucerian cannon, or in the ME period overall (cf. Hanna & Traugott 2008 and citations in the MED). It must be emphasised in this sense that Chaucer not only drew from the vocabulary and word-formation strategies of a fourteenth-century Londoner's speech, but also from his contact with speakers from the surrounding country, from Latin, French and Italian (Burnley 1983: 103). The result is that the *Boece* is a sample of careful, literary language, and at the same time an innovative translation, stretching resources both native and borrowed to maximise its expressive power.

Although a new, careful revision of the numerous early manuscripts and printed editions of the text is available (Hanna & Traugott 2008), once again, in this study we use a version of the text available electronically: Morris's (1868) edition for the Early English Text Society. This version includes approximately 25,000 words, since it spans both the original prose and the *metra*. References to the text are made using Hanna and Traugott's (2008) line numbering in *The Riverside Chaucer*, which is also consulted in cases of ambiguity in Morris' edition.

Appendix D

Categorisation of Old English prefixes mentioned in this thesis

For the purposes of categorisation, Table D below follows Elenbaas (2007) and van Kemenade & Los (2003) in including clearly directional forms that appear in pre- and post-verbal position as separable prefixes. This said, it is unlikely such a clear-cut divide was synchronically possible, and the distinction may ultimately be gradient, rather than categorical (see Hiltunen 1983: fn. 25 , Kastovsky 1992: 375).

Inventories of OE prefixes vary across the literature depending on the inclusion of more clearly lexical (adjectival and adverbial) elements, which elsewhere are simply considered compounding elements. Here, the most commonly mentioned prefixes are listed alongside examples of their use in major word categories and their stress patterns for the inseparable forms.

Table D.1: OE prefixes by category

PREFIX	NOMINAL (and adjectival)	INSEP. VERBAL (and adverbial)	SEPARABLE VERBAL	STRESS Np	STRESS Vp
of-/æf-	*ǽfgrynde* 'abyss'	*ofsmórian* 'suffocate'	*ofcearfan* 'cut off'	S	U
on-	*ónscyte* 'calumny'	*onfénge* 'receive'	*onahebban* 'lift up'	S	U
oð-/ūð-	*óþhilde* 'content'	*ūþwítian* 'study'	—	S	U
ed-	*édlean* 'reward'	*ednìwian* 'renew'	—	S	U
æt-	*ætgræpe* 'seizing'	*ætfǽstan* 'fix'	—	S	U
ymb-	*ýmbsittend* 'neighbor'	*ymbséttan* 'surround'	—	S	U
tō-	*tóþegnung* 'administration'	*tōbrécan* 'break in two'	*tōcūman* 'come to, arrive'	S	U
and-	*ándsaca* 'apostate'	*andswàrian* 'answer'	—	S	U
wið-/wiðer-	*wíðerbersta* 'adversary'	*wiðwínnan* 'battle'	*wiðlǣdan* 'lead away'	S	U
for-	*forgéfenesse* 'forgiveness'	*forwéorþan* 'perish'	—	U	U
ge-	*gesíht* 'vision'	*gelíman* 'stick together'	—	U	U
ā-/ǣ-	*´ǣfyrmþa* 'ablutions'	*āǽdan* 'lay waste'	—	S	U
mis-	*mísdǣd* 'misdeed'	*misbéodan* 'treat wrongly'	—	S	U
be-	*behólden* 'hidden'	*beféallan* 'befall'	—	U	U
bī-	*bíspell* 'example'	—	—	S	—
un-/on-	*unbealu* 'innocence'	*onbíndan* 'unbind'	—	V	U
fore-	*fóre-tēþ* 'incisor teeth'	*forecýnnan* 'know before'	—	S	U
under-	*únderburh* 'suburb'	*undergán* 'undermine, ruin'	*underirnan* 'run beneath'	S	U
ofer-	*ófersælig* 'very fortunate'	*oferfaran* 'go over'	*oferclimban* 'climb over'	S	—

ūt-	*ūtdrǣf* ‘ejection’	*ūtlágian* ‘banish’	ūtscufan ‘push out’	S U
forþ-	*fórðdǣd* ‘profit’	—	*forðberan* ‘carry forth’	S —
in-/inn	*ínlendisc* ‘native’	—	*inngang* ‘go in’	S —
up-	*úpende* ‘upper side’	—	*upheah* ‘lift up’	S —
þurh-	*þúrhhefig* ‘very heavy’	*ðurhsméagan* ‘search through’	—	S U
or-	*órsawle* ‘lifeless’	—	—	S —

(Np=nominal prefix; Vp=verbal prefix; S=stressed; U=unstressed; V=variable stress)

An important issue for OE prefixes concerns the synchronic relation between etymologically linked nominal and verbal prefixes with variant spellings (of-/æt-, oð-/ūð-, etc.). Although Table D lists the alternating forms together as ‘strong’ (nominal) and ‘weak’ (verbal), a productive synchronic allomorphy is dubious, since, as Minkova (2008: 27-8) points out, the spelling alternation occurs in both nominal and verbal forms.

Bibliography

Adelaar, Willem F. H. (1997) Las transiciones en la tradición gramatical hispanoamericana: historia de un modelo descriptivo gramatical hispanoamericano. In *La Descripción de las Lenguas Amerindias en la Época Colonial*, K. Zimmermann, ed., Madrid: Iberoamericana, 259–270.

Adelaar, Willem F. H. (2009) Inverse markers in Andean languages: A comparative view. In *The Linguistics of Endangered Languages*, W.L. Wetzels, ed., LOT Occasional Series, 13, Utrecht: LOT, 171–185.

Adelaar, Willem F. H. & Pieter C. Muysken (2004) *The Languages of the Andes*. Cambridge: Cambridge University Press.

Aikhenvald, Alexandra (2006) Serial verb constructions in a typological perspective. In *Serial verb constructions: a cross-linguistic typology*, Alexandra Aikhenvald & R. M. W. Dixon, eds., Oxford: Oxford University Press, 1–87.

Aikhenvald, Alexandra (2007) Typological dimensions in word-formation. In *Language Typology and Syntactic Description. Grammatical Categories and the Lexicon 3*, Timothy Sophen, ed., Cambridge: Cambridge University Press, 1–65.

Alber, Birgit (2005) Clash, lapse and directionality. *Natural Language and Linguistic Theory* **23**: 485–642.

Altshuler, Daniel (2006) Osage fills the gap: The quantity insensitive iamb & the typology of feet, unpublished Ms. available at http://roa.rutgers.edu/article/view/893.

Altshuler, Daniel (2009) Quantity Insensitive Iambs in Osage. *International Journal of American Linguistics* **75**(3): 365–398.

Alvar, Manuel, Francisco Moreno, & Hiroto Ueda (1997) La sexta vocal del mapuche. *Thesaurus* **LII**(1,2,3): 183–189.

Alvarez-Santullano Busch, Maria Pilar (1992) Variedad interna y deterioro del dialécto huilliche. *Revista de Lingüística Teórica y Aplicada* **30**: 61–74.

Arnold, Jennifer (1994) Inverse voice marking in Mapudungun. In *Proceedings of the Twentieth Annual Meeting of the Berkeley Linguistics Society*, vol. 20, Berkeley Linguistics Society.

Aronoff, Mark (1983) Potential words, actual words, productivity and frequency. In *Proceedings of the 13th International Congress of Linguistics*, 163–161.

Augusta, Félix José (1903) *Gramática Araucana*. Valdivia: Imprenta Central J. Lampert.

Augusta, Félix José (1910) *Lecturas Araucanas (Narraciones, Costumbres, Cuentos, Canciones, etc.) reunidas por Fray Félix José de Augusta con la cooperación de Fray Sigfriedo de Fraunhäusl, misioneros apostólicos capuchinos de la Provincia de Baviera*. Padre Las Casas: Editorial San Francisco.

Augusta, Félix José (1916) *Diccionarion Araucano-Español y Español-Araucano*. Santiago: Imprenta Universitaria.

Bailey, Charles J. & Karl Maroldt (1977) The French Lineage of English. In *Pidgins - Creoles - Languages in Contact*, Jürgen Meisel, ed., Tübingen: Narr, 21–53.

Baker, Chris (1989) Extrametricality, the cycle, and Turkish word stress. In *Phonology at Santa Cruz*, *Syntax Research Centre*, vol. 1, Junko Ito & Jeff Runner, eds., University of California, 1–34.

Baker, Mark C (1996) *The Polysynthesis Parameter*. Oxford: Oxford University Press.

Baker, Mark C (2003) On the Loci of Agreement: Inversion constructions in Mapudungun, unpublished Ms. Rutgers University available at www.rci.rutgers.edu/˜mabaker/mapuche-inversion.pdf.

Baker, Mark C (2006) On Zero Agreement and Polysynthesis. In *Arguments and Agreement*, Peter Ackema, Patrick Brandt, Maaike Schoorlemmer, & Fred Weerman, eds., Oxford: Oxford University Press, 289–320.

Baker, Mark C (2009) Is Head Movement Still Needed for Noun Incorporation? *Lingua* **119**: 148–165.

Baker, Mark C., Roberto Aranovich, & Lucía A. Golluscio (2005) Two Types of Syntactic Noun Incorporation: Noun Incorporation in Mapudungun and Its Typological Implications. *Language* **81**(1): 138–176.

Baker, Mark C. & Roberto Fasola (2009) Araucanian: Mapudungun. In *The Oxford Handbook of Compounding*, R. Lieber & P Stekauer, eds., Oxford: Oxford University Press, 594–608.

Bammesberger, Alfred (1992) The place of English in Germanic and Indo-European. In Hogg, *The Cambridge History of the English Language Vol. I*, 26–66.

Bauer, Laurie (2001) *Morphological Productivity*. Cambridge: Cambridge University Press.

Bauer, Laurie (2003) *Introducing Linguistic Morphology*. Edinburgh: Edinburgh University Press.

Baugh, Albert (1935) *A History of the English Language*. London: D. Appleton-Century Company.

Beasley, Tim & Katherine Crosswhite (2003) Avoiding boundaries: antepenultimate stress in a rule-based framework. *Linguistic Inquiry* **34**: 391–392.

Beckman, Mary (1986) *Stress and Non-Stress Accent*. Dordrecht: Foris.

Bell, A (1977) Accent placement and perception of prominence in rhythmic structures. In *Studies in Stress and Accent*, Larry Hyman, ed., Los Angeles: UCLA Department of Linguistics, 1–13.

Bengoa, José (2000) *Historia del Pueblo Mapuche (siglos XIX y XX)*. Santiago: Lom Ediciones.

Benson, Larry (2008) The canon and chronology of Chaucer's work. In *The Riverside Chaucer*, Christopher Cannon, ed., Oxford: Oxford University Press, xxii–xxv.

Bermúdez-Otero, Ricardo (2011) Cyclicity. In van Oostendorp *et al*, 2019–2048.

Bermúdez-Otero, Ricardo (2012) The architecture of grammar and the division of labour in exponence. In *The Morphology and Phonology of Exponence*, Jochen Trommer, ed., Oxford Studies in Theoretical Linguistics 41, Oxford: Oxford University Press, 8–83.

Bermúdez-Otero, Ricardo (2013) The stem-level syndrome. Paper presented to the UPenn Linguistics Department, Speaker Series, Philadelphia, 11 April 2013, available at http://www.bermudez-otero.com/stemlevel.pdf.

Bermúdez-Otero, Ricardo (2014) Amphichronic explanation and the life cycle of phonological processes. In *The Oxford Handbook of Historical Phonology*, Patrick Honeybone & Joseph Salmons, eds., Oxford: Oxford University Press.

Bion, Ricardo A. H., Sylvia Benavides-Varela, & Marina Nespor (2011) Acoustic markers of prominence influence infants' and adults' segmentation of speech sequences. *Language and Speech* **54**: 123–140.

Björkman, Erik (1900) *Scandinavian Loan-Words in Middle English*. Halle: Ehrhardt Karras.

Blaho, Sylvia & Daniel Szeredi (2011) Secondary stress in Hungarian: (morpho)syntactic, not metrical. In *Proceedings of the 28th West Coast Conference on Formal Linguistics*, Mary Byram Washburn, Katherine McKinney-Bock, Erika Varis, Ann Sawyer, & Barbara Tomaszewicz, eds., Somerville, MA: Cascadilla Proceedings Project, 51–59.

Boersma, Paul & David Weenik (2012) Praat: doing phonetics by computer (Version 5.3.24). Available at http://www.praat.org/, downloaded 24 September 2012.

Bolton, T. L. (1894) Rhythm. *American Journal of Psychology* **6**: 145–238.

Booij, Geert (2005) *The Grammar of Words*. Oxford: Oxford University Press.

Booij, Geert & Jerzy Rubach (1987) Postcyclic versus Postlexical Rules in Lexical Phonology. *Linguistic Inquiry* **18**(1): 1–44.

Booij, Geert & Ans van Kemenade (2003) Introduction. In *Yearbook of Morphology 2003*, Geert Booij & Ans van Kemenade, eds., Dordrecht: Kluwer Academic Publishers, 2–33.

Brinton, Laurel (1989) *The Development of English Aspectual Systems*. Cambridge: Cambridge University Press.

Buckley, Eugene (1992) *Theoretical aspects of Kashaya phonology and morphology.* Ph.D. thesis, University of California, Berkeley, CA.

Buckley, Eugene (1994) Persistent and cumulative extrametricality in Kashaya. *Natural Language and Linguistic Theory* **12**(3): 423–464.

Buckley, Eugene (2009) Locality in metrical typology. *Phonology* **26**: 389–435.

Burnley, David (1983) *A guide to Chaucer's Language*. London: Macmillan.

Burnley, David (1992) Lexis and semantics. In *The Cambridge History of the English Language Vol. II: 1066-1476*, Norman Blake, ed., Cambridge: Cambridge University Press, 409–499.

Campbell, Alistair (1959) *Old English Grammar*. Oxford: Oxford University Press.

Campbell, Lyle (1997) *American Indian Languages: The historical linguistics of Native America*. New York, NY: Oxford University Press.

Caniguan, Natalia & Francisca Villarroel (2011) *Müñkupe üllkatun. Que el canto llegue a todas partes*. Santiago: Gráfica LOM.

Carr, Philip & Patrick Honeybone (2007) English phonology and linguistic theory: an introduction to issues, and to 'Issues in English Phonology'. *Language Sciences* **29**: 117–153.

Catalán, Rosa (2012) *Estudio fonético acústico de las vocales del mapudungun.* Master's thesis, Pontificia Universidad Católica de Chile, Santiago.

Catrileo, Maria (2005) ¿Cómo se expresa la dirección espacial en mapudungun? In *XVI Congreso Sociedad Chilena de Lingüística : Actas*, Sociedad Chilena de Lingüística, Valdivia: 8-24.

CEP: Centro de Estudios Públicos (2006) Estudio opinión pública: Los mapuche rurales y urbanos hoy. Tech. Rep. 367, Centro de Estudios Públicos, Santiago, URL `http://www.cepchile.cl/1_3853/doc/estudio_de_opinion_publica_los_mapuche_rurales_y_urbanos_hoy_mayo_2006.html#.UXED-hj_Skh`.

Cepeda, G, A Barrientos, & V Poblete (1995) Análisis sonográfico frecuencial de las vocales del español de Valdivia (Chile). *Estudios Filológicos* **30**: 81–96.

Cerda, Rodrigo (2009) Situación socioeconómica reciente de los mapuches en la Región de la Araucanía. *Estudios Públicos* **113**: 27–107.

Chomsky, Naom & Morris Halle (1968) *The Sound Pattern of English*. New York, NY: Harper and Row.

Comrie, Bernard (1989) *Language Universals and Linguistic Typology: Syntax and Morphology*. Chicago, IL: The University of Chicago Press, second ed.

Croese, Robert (1980) Estudio dialectológico del mapuche. *Estudios Filológicos* **15**: 7–38.

Croese, Robert (1984) Tiempo verbal en mapudungun. *Actas de Lengua y Cultura Mapuche* **1**: 64–76.

Croese, Robert (1985) Mapuche Dialectal Survey. In *South American Indian languages. Retrospect and prospect*, H. Klein & L. Stark, eds., Austin: University of Texas Press, 784–801.

Croese, Robert (1989) Evidencias léxicas y gramaticales para una posible filación del Mapudungun con la familia arawak. In *Temas de lingüística amerindia. Primer Congreso Nacional de Investigaciones Lingüístico-Filológicas.*, R. Cerrón-Palomino & G. Solś Fonseca, eds., Lima: CONCYTEC/GTZ, 275–290.

Croese, Robert (1991) Evidencias léxicas y gramaticales para una posible filación del Mapudungun con la macro-familia arawaka. *Revista Latinoamericana de Estudios Etnolingüísticos* **6**: 283–296.

Dalton-Puffer, Christien (1995) Middle English is a creole and its opposite: On the value of plausible speculation. In *Linguistic Change under Contact Conditions*, Jacek Fisiak, ed., Berlin: Mouton de Gruyter, 35–50.

Danielsson, Bror (1948) *Studies in the accentuation of polysyllabic Latin, Greek, and Romance loan words in English*. Stockholm: Almqvis & Wiksel.

De la Cruz, Juan M (1975) Old English pure prefixes: structure and functions. *Linguistics* **145**: 47–81.

de Lacy, Paul (forthcoming) Evidence for stress systems. In van der Hulst.

de Olivares, Luis (2005) *Los Jesuitas en la Patagonia: Las misiones en la Araucanía y el Nahuelhuapi (1593-1796)*. Santiago: Corriente.

de Reuse, W J (2006) Polysynthetic Language: Central Siberian Yupik. In *Encyclopedia of Language and Linguistics*, Keith Brown, ed., Oxford: Elsevier, second ed., 745–748.

Dekeyser, Xavier (1986) Romance loans in Middle English: a reassessment. In *Linguistics across historical and geographical boundaries*, Dieter Kastovsky & D. Swedek, eds., Berlin: Mouton de Gruyter, 253–265.

Dell, François (1984) L'accentuation des phrases en Francais. In *Forme sonore du langage; structure des représentations en phonologie*, François Dell, D. Hirst, & Jean-Roger Vergnaud, eds., Paris: Hermann, 65–122.

Díaz-Fernández, Antonio (2011) Situación actual de la lengua mapuche en Chubut (Argentina) y la educación intercultural bilingüe. In *Proceedings of the First Symposium on Teaching Indigenous Languages of Latin America (STILLA-2008) Actas del Primer Simposio sobre Enseñanza de Lenguas Indígenas de América Latina*, Serafín M. Coronel-Molina & John H. McDowell, eds., Bloomington, IN: Centre for Latin American and Carabbean Studies, Indiana University.

Dik, Simon (1997) *The theory of functional grammar*, vol. 1 The structure of the clause. Berlin: Mouton de Gruyter.

DOE (2009) *Dictionary of Old English Corpus*. Toronto: University of Toronto.

Downing, Laura J. (2006) *Canonical Forms in Prosodic Morphology*. Oxford: Oxford University Press.

Dresher, B. Elan & Aditi Lahiri (1991) The Germanic Foot: Metrical coherence in Old English. *Linguistic Inquiry* **22**(2): 251–286.

Dresher, B. Elan & Aditi Lahiri (2003) Main stress left in Early Middle English. In *Historical Linguistics 2003*, Michael Fortescue, Eva Skafte, Jens Erik Mogensen, & Lene Schøsler, eds., Amsterdam: John Benjamins, 75–85.

Dresher, B. Elan & Harry van der Hulst (1998) Head-dependent asymmetries in phonology. *Phonology* **15**: 317–352.

Du Ponceau, Pierre Etienne (1838) *Memoire sur le Système Grammatical des Langues de quelques Nations Indiennes de L'Amèrique du Nord*. Paris: A. Pihan de La Forest.

Dupoux, Emmanuel, Christoph Pallier, Nuria Sebastián-Gallés, & Jacques Mehler (1997) A destressing 'deafness' in French? *Journal of Memory and Language* **36**: 406–421.

Dupoux, Emmanuel, Nuria Sebastián-Gallés, Eduardo Navarrete, & Sharon Peperkamp (2008) Persistent stress 'deafness': The case of French learners of Spanish. *Cognition* **106**: 682–706.

Durán, Teresa & Nelly Ramos (1986) Incorporación del español por los mapuches del centro-sur de Chile durante los siglos XVI, XVII y XVII. *Lenguas Modernas* **12**: 17–37.

Echeverría, Sergio Max (1964) Descripción fonológica del mapuche actual. *Boletín del Instituto de Filología de la Universidad de Chile* **25**: 13–59.

Echeverría, Sergio Max & Heles Contreras (1965) Araucanian Phonemics. *International Journal of American Linguistics* **31**(2): 132–135.

Elenbaas, Marion (2007) *The Synchronic and Diachronic syntax of English verb-particle constructions*. Ph.D. thesis, Radboud University (LOT Dissertations 149), Nijmegen.

Englert de Dillingen, Sebastian (1936) Lengua y literatura araucanas. *Anales de la Facultad de Filosofía y Educación de la Uniersidad de Chile* **1**(2-3): 62–109.

Erize, Esteban (1960) *Diccionario comentado mapuche-español*. Buenos Aires: Universidad Nacional del Sur.

Escudero, Alfonso (1963) Rodolfo Lenz. *Thesaurus* **XVIII**(2): 445–484.

Espindola, Walter Hanisch (1974) *Historia de la Compañía de Jesús en Chile*. Santiago: Editorial Francisco de Aguirre.

Evans, Nicholas & Stephen C. Levinson (2009) The myth of language universals: Language diversity and its importance for cognitive science. *Behavioural and Brain Sciences* **32**: 429–492.

Febrés, Andrés (1765) *Arte de la Lengua General del Reyno de Chile*. Lima.

Fennell, Barbara (2001) *A History of English: A Sociolinguistic Approach*. Oxford: Blackwell.

Fernández-Garay, Ana (1991) The phonology of Ranquel and phonological comparison with other Mapuche dialects. In *Language Change in South American Indian Languages*, Mary Ritchie Key, ed., Philadelphia: University of Pensylvania Press, 97–110.

Fernández-Garay, Ana & Marisa Malvestitti (2008) Construcciones verbales seriales en mapudungun. *Lexis* **31**(1): 33–48.

Ferreccio, Mario (1980) Presentación. In *Diccionario etimológico de las voces chilenas derivadas de lenguas indígenas americanas*, Rodolfo Lenz, ed., Santiago: Seminario de filología hispánica de la Uniersidad de Chile, 7–24.

Fikkert, Paula (2003) The prosodic structure of prefixed words in the history of West Germanic. In *Developments in Prosodic Systems*, Paula Fikkert & Haike Jakobs, eds., Berlin: Mouton de Gruyter, 315–348.

Fikkert, Paula, B. Elan Dresher, & Aditi Lahiri (2006) Prosodic Preference: from Old English to Early Modern English. In van Kemenade and Los, 125–150.

Fischer, Olga (1992) Syntax. In *The Cambridge History of the English Language Vol. II: 1066-1476*, Norman Blake, ed., Cambridge: Cambridge University Press, 207–408.

Fitzpatrick-Cole, Jennifer (1996) Reduplication meets the phonological phrase in Bengali. *The Linguistic Review* **13**: 305–356.

Fry, D. B. (1955) Duration and intensity as physical correlates of linguistic stress. *Journal of the Acoustical Society of America* **27**: 765–768.

Fry, D. B. (1958) Experiments in the perception of stress. *Language and Speech* **1**: 120–152.

Fulk, R. D. (2008) English as a Germanic Language. In *A Companion to the History of the English Language*, Haruko Momma & Michael Matto, eds., Oxford: Wiley-Blackwell, 142–149.

Garde, Paul (1967) *L'accent*. Paris: Presses Universitaires de France.

Geipel, John (1971) *The Viking Legacy: The Scandinavian Influence on the English and Gaelic languages*. Newton Abbot: David & Charles.

Gneuss, Helmut (1972) The origin of standard Old English and Æthelwold's school at Winchester. *Anglo Saxon England* **1**: 63–83.

Godden, Malcom (1992) Literary Language. In Hogg, *The Cambridge History of the English Language Vol. I*, 490–535.

Godden, Malcom & Susan Irvine (2009) *The Old English Boethius*. Oxford: Oxford University Press.

Golluscio, Lucía (2000) Rupturing implicature in the Mapudungun verbal system: the suffix *-fi*. *Jounal of Pragmatics* **32**: 239–263.

Golluscio, Lucía (2007) Morphological causatives and split intransitivity in Mapudungun. *International Journal of American Linguistics* **72**: 209–238.

Golluscio, Lucía (2010) Ditransitive constructions in Mapudungun. In *Studies in ditransitive constructions: A comparative handbook*, Andrei Malchukov, Martin Haspelmath, & Bernard Comrie, eds., Berlin: Mouton de Gruyter, 710–756.

Gordon, Matthew (2002) A factorial typology of quantity insensitive stress. *Natural Language and Linguistic Theory* **20**: 491–552.

Gordon, Matthew (2004) A phonetic and phonological study of word-level stress in Chickasaw. *International Journal of American Linguistics* **70**: 1–32.

Gordon, Matthew (2011a) Stress: Phonotactic and Phonetic Evidence. In van Oostendorp *et al*, 924–948.

Gordon, Matthew (2011b) Stress Systems. In *The Handbook of Phonological Theory*, John Goldsmith, Jason Riggle, & Alan C. L. Yu, eds., chap. 5, Oxford: Wiley-Blackwell, 141–163.

Görlach, Manfred (1986) Middle English - a Creole? In *Linguistics across historical and geographical boundaries. In honour of Jacek Fisiak*, Dieter Kastovsky, ed., Trends in Linguistics. Studies and Monographs 32, Berlin: Mouton de Gruyter, 329–244.

Greenberg, Joseph (1978) *Language in the Americas*. Stanford, CA: Stanford University Press.

Greenberg, Joseph & Dorothea Kaschube (1976) Word prosodic systems: a preliminary report. *Working Papers on Language Universals* **20**: 1–18.

Grimes, Joseph E (1985) Topic Inflection in Mapudungun Verbs. *International Journal of American Linguistics* **51**(2): 141–163.

Gundermann, Hans, Jaqueline Caniguan, Ernesto Castillo, Alejandro Clavería, & Cesar Faúndez (2008) Perfil sociolingüístico de comunidades mapuche de la VIII, IX y X Región. Informe de resultados, Universidad Tecnológica Metropolitana, Santiago.

Gundermann, Hans, Jaqueline Canihuan, Alejandro Clavería, & Cesar Faúndez (2011) El mapuzungun, una lengua en retroceso. *Atenea* **5**(03): 111–131.

Gussenhoven, Carlos (2004) *The phonology of tone and intonation*. Cambridge: Cambridge University Press.

Gussenhoven, Carlos (2007) Intonation. In *The Cambridge companion to phonology*, Paul de Lacy, ed., chap. 11, Cambridge University Press, 253–280.

Hale, Kenneth & Josie White Eagle (1980) A preliminary metrical account of Winnebago accent. *International Journal of American Linguistics* **46**: 117–132.

Halle, Morris & Samuel Keyser (1971) *English Stress: Its form, growth and its role in verse*. New York, NY: Harper and Row.

Halle, Morris & Jean-Roger Vergnaud (1987a) *An Essay on Stress*. Cambridge, MA: MIT Press.

Halle, Morris & Jean-Roger Vergnaud (1987b) Stress and the Cycle. *Linguistic Inquiry* **18**(1): 45–84.

Hammond, Michael (1987) Hungarian Cola. *Phonology Yearbook* **4**: 559–562.

Hammond, Michael (2006) Prosodic Phonology. In *The Handbook of English Linguistics*, Bas Aarts & April McMahon, eds., Oxford: Wiley-Blackwell, 411–432.

Hamp, Eric P. (1971) On Mayan-Araucanian comparative philology. *International Journal of American Linguistics* **37**(3): 156–159.

Hanna, Ralph & Lawler Traugott (2008) Introduction to Chaucer's Boece. In *The Riverside Chaucer*, Christopher Cannon, ed., Oxford: Oxford University Press, 395–397.

Hansen, B. H. (1984) The historical implications of the Scandinavian element in English: a theoretical valuation. *Nowele* : 53–95.

Hansen, Kenneth & Lesley Hansen (1969) Pintupi Phonology. *Oceanic Linguistics* **2**: 153–170.

Haraguchi, Shosuke (1999) Accent. In *The Handbook of Japanese Linguistics*, Natsuko Tsujimura, ed., chap. 1, Wiley-Blackwell, 1–30.

Harbert, Wayne (2007) *The Germanic Languages*. Cambridge: Cambridge University Press.

Harmelink, Bryan (1987) The uses and functions of 'mew' in Mapudungun. *Lenguas Modernas* **14**: 173–178.

Harmelink, Bryan (1988) The expression of temporal distinctions in Mapudungun. *Lenguas Modernas* **15**: 125–130.

Harmelink, Bryan (1992) La incorporación nominal en el mapudungun. *Lenguas Modernas* **19**: 129–138.

Harmelink, Bryan (1996) *Manual de aprendizaje del idioma mapuche*. Temuco: Universidad de la Frontera.

Harris, James W. (1996) Projection and edge marking in the computation of Stress in Spanish. In *The Handbook of Phonological Theory*, John Goldsmith, ed., Oxford: Blackwell, 867–887.

Hasler, Felipe (2009) *El Morfema -fu del mapudungun como un marcador del antiperfecto*. Master's thesis, Facultad de Humanidades Universidad de Chile, Santiago.

Hasler, Felipe & Guillermo Soto (2012) Determinación de algunas propiedades del subsistema consonántico del mapudungun y el del español de Chile en los siglos XVI y XVII a partir de los hispanismos léxicos. In *Lenguas indígenas de América del Sur*, *Volúmenes temáticos de la Sociedad Argentina de Lingüística*, vol. I Fonología y léxico, Hebe A. González & Beatriz Gualdieri, eds., Mendoza, Argentina: Editorial de la Facultad de Filosofía y Letrasde la Universidad Nacional de Cuyo, 92–102.

Havestadt, Bernhard (1777) *Chilidugú: sieve tractatus linguæ Chilensis*. Leipzig: Treubner.

Hayes, Bruce (1979) Extrametricality. In *MIT Working Papers in. Linguistics*, vol. 1, Cambridge, MA: MIT Press, 77.87.

Hayes, Bruce (1980) *A Metrical Theory of Stress Rules*. (published 1985, New York: Garland), MIT, Cambridge, MA.

Hayes, Bruce (1982) Extrametricality and English Stress. *Linguistic Inquiry* **13**: 227–250.

Hayes, Bruce (1985) Iambic and Trochaic Rhythm in Stress Rules. In *Proceedings of the Eleventh Annual Meeting of the Berkeley Linguistics Society*, Berkeley, CA: Berkeley Linguistics Society, 429–446.

Hayes, Bruce (1989) Compensatory lengthening in moraic phonology. *Linguistic Inquiry* **20**: 253–306.

Hayes, Bruce (1995) *Metrical Stress Theory*. Chicago: University of Chicago Press.

Hermans, Ben (2011) The Representation of Word Stress. In van Oostendorp *et al*, 1003–1026.

Hernández, Arturo, Nelly Ramos, & Rosa Hunchulaf (2006) *Gramática Básica de la Lengua Mapuche*, vol. 1. Temuco: Universidad Católica de Temuco.

Hiltunen, Risto (1983) *The Decline of the Prefixes and the Beginnings of the English Phrasal Verb*. Turku: Turun Yliopisto.

Hines, John (1990) The Runic Inscriptions of Early Anglo-Saxon England. In *Britain 400-600: Language and History*, Alfred Bammesberger & Alfred Wollmann, eds., Heidelberg: Carl Winter Universitätverlag, 437–56.

Hogg, Richard, ed. (1992a) *The Cambridge History of the English Language Vol. I: The Beginnings to 1066*. Cambridge: Cambridge University Press.

Hogg, Richard (1992b) *A Grammar of Old English*, vol. 1. Oxford: Blackwell.

Hogg, Richard (2006) Old English Dialectology. In van Kemenade and Los, 395–416.

Hopper, Paul (1975) *The syntax of the simple sentence in Proto-Germanic*. The Hague: Mouton de Gruyter.

Hopper, Paul & Elizabeth Traugott (2003) *Grammaticalization*. Cambridge: Cambridge University Press.

Horobin, Simon & Jeremy Smith (2002) *An Introduction to Middle English*. Edinburgh: Edinburgh University Press.

Hualde, José Ignacio (1999) Basque Accentuation. In van der Hulst, 947–993.

Hualde, José Ignacio & Marina Nadeu (forthcoming) Rhetorical stress in Spanish. In van der Hulst, in press.

Hung, Henrietta (1993) Iamabicity, Rhythm and Non-Parsing, brandeis University, Waltham, Mass.

Hung, Henrietta (1994) *The Rhythmic and Prosodic Organization of Edge Constituents*. Ph.D. thesis, Brandeis University., Waltham, MA.

Hyde, Brett (2001) *Metrical and prosodic structure in Optimality Theory*. Ph.D. thesis, Rutgers University, New Brunswick, NJ.

Hyde, Brett (2002) A Restrictive Theory of Metrical Stress. *Phonology* **19**: 313–339.

Hyde, Brett (2011) The Iambic-Trochaic Law. In *A Companion to Phonology*, Harry van der Hulst, Colin Ewen, Elizabeth Hume, & Karen Rice, eds., Oxford: Oxford University Press, 1052–1077.

Hyde, Brett, Kenneth Hofmeister, & Brooke Husic (2012) Post-peninitial accent in Kashaya: An alternative to initial extrametricality. In *Proceedings of the 29th West Coast Conference on Formal Linguistics*, Jaehoon Choi, ed., Somerville, MA: Cascadilla Proceedings Project, 117–124.

Hyman, Larry (1977) On the nature of linguistic stress. In *Studies in Stress and Accent*, vol. SCOPIL, Larry Hyman, ed., University of Southern California, 37–82.

Hyman, Larry (1984) On the weightlessness of syllable onsets. In *Proceedings of the Tenth Annual Meeting of the Berkeley Linguistics Society*, C. Burgman & M. Macaulay, eds., University of California, Berkeley.

Hyman, Larry (1985) *A Theory of Phonological Weight*. Dordrecht: Foris.

Hyman, Larry (2006) Word-prosodic typology. *Phonology* **23**: 225–256.

Hyman, Larry (2009) How (not) to do phonological typology: the case of pitch-accent. *Language Sciences* **31**: 213–238.

Hyman, Larry (forthcoming) Do All Languages Have Word Accent? In van der Hulst, in press.

INEC: Instituto Nacional de Estadísticas y Censos (2005) Encuesta Complementaria de Pueblos Indígenas (ECPI) 2004–2005. Tech. rep., Instituto Nacional de Estadísticas y Censos, Buenos Aires, URL `http://www.indec.mecon.ar/webcenso/ECPI/pueblos/Datos/0700c0302.xls`.

Ingeberg Klein, Diana (2008) *La Teoría Indigenista de Rodolfo Lenz y sus Entendimentos*. Norderstedt: Grin Verlag.

Inkelas, Sharon (1991) *Prosodic Constituency in the Lexicon*. Outstanding Disertations in Linguistics, New York, NY: Garland.

Inkelas, Sharon (1999) Exceptional stress-attracting suffixes in Turkish: representations versus the grammar. In *The prosody-morphology interface*, René Kager, Harry van der Hulst, & Wim Zonneveld, eds., Cambridge: Cambridge University Press, 134–187.

Inkelas, Sharon & Cemil Orhan Orgun (1998) Level (non)ordering in recursive morphology : evidence from Turkish. In *Morphology and its relation to phonology and syntax*, Steven Lapointe & Patrick Farrell, eds., Stanford, CA: CSLI, 360–392.

Irarrázaval, Ignacio & María de los Ángeles Morandé (2007) Cultura Mapuche: Entre la permanencia étnica y la integración nacional. *Estudios Públicos* **105**: 37–59.

Jakobson, Roman (1931) Prinzipien der historischen Phonologie. *Travaux du Cercle Linguistique de Prague* **4**: 247–267.

Jessen, Michael (2008) German. In *Word Prosodic Systems in the Languages of Europe*, Harry van der Hulst, ed., chap. 8 Wordstress in West-Germanic and North-Germanic Languages, Berlin: Mouton de Gruyter, 515–545.

JMP (2012) Version 10, SAS Institute Inc. www.jmp.com downloaded 10 Jan. 2016.

Johnson, Keith (2008) *Quantitative Methods in Linguistics*. Oxford: Wiley-Blackwell.

Joseph, Brian (2004) Rescuing traditional (historical) linguistics from grammaticalisation theory. In *Up and down the cline – the nature of grammatialization*, Olga Fischer, Muriel Norde, & Harry Perridon, eds., Amsterdam: John Benjamins, 45–72.

Kager, René (1989) *A metrical theory of stress and destressing in English and Dutch*. Dordrecht: Foris.

Kager, René (1993) Alternatives to the Iambic-Trochaic Law. *Natural Language and Linguistic Theory* **11**: 381–432.

Kager, René (2005) Rhythmic licensing theory: an extended typology. In *Proceedings of the 3rd Seoul Internationa Conference on Linguistics (SICOL)*, Seoul: Linguistics Society of Korea, 5–31.

Kager, René (2007) Feet and metrical stress. In *The Cambridge companion to phonology*, Paul de Lacy, ed., Cambridge: Cambridge University Press, 195–227.

Kager, René (2012) Stress in windows: Language typology and factorial typology. *Lingua* **112**: 1454–1493.

Kastovsky, Dieter (1992) Semantics and Vocabulary. In Hogg, *The Cambridge History of the English Language Vol. I*, 290–408.

Kaufman, Terrence (1990) Language history in South America: What we know and how to know more. In *Amazonian Linguistics: Studies in Lowland South American langauges*, D. Payne, ed., Austin: University of Texas Press, 13–67.

Kawahara, Shigeto (2011) Experimental Approaches in Theoretical Phonology. In van Oostendorp *et al*, 2283–2303.

Kendall, Calvin (1981) The prefix *un-* and the metrical grammar of *Beowulf*. *Anglo Saxon England* **10**: 29–52.

Kenesei, István, Robert Michael Vago, & Anna Fenyvesi (1998) *Hungarian*. London: Routledge.

Kennedy, Christopher (1994) Morphological alignment and head projection. In *Phonology at Santa Cruz*, vol. 3, Jason Merchant, Jaye Padgett, & Rachel Walker, eds., Santa Cruz: Linguistics Research Centre, 47–64.

Kenstowicz, Michael (1994a) *Phonology in Generative Grammar*. Oxford: Blackwell.

Kenstowicz, Michael (1994b) Sonority driven stress, ms. MIT, available as ROA-33 from the Rutgers Optimality Archive.

Key, Mary Ritchie (1978) Araucanian Genetic Relationships. *International Journal of American Linguistics* **44**(4): 289–293.

Key, Mary Ritchie (1981) North and South American linguistic connections. *La Linguistique* **17**(1): 3–18.

Kiparsky, Paul (1982) Lexical Phonology and Morphology. In *Linguistics in the Morning Calm*, In-Seok Yang, ed., Seoul: Hansin, 3–91.

Kiparsky, Paul (1985) Some consequences of Lexical Phonology. *Phonology Yearbook* **2**: 85–138.

Kiparsky, Paul (1998) Siever's Law as prosodic optimization. In *Mir Curad: Studies in Honor of Calvert Watkins*, Jay Jasanoff, H. Craig Melchert, & Lisi Oliver, eds., Innsbrucker Beiträge zur Sprachwiessenschaft, 345–360.

Kiparsky, Paul (2000) Opacity and Cyclicity. *The Linguistic Review* **17**: 251–365.

Kiparsky, Paul (2008) Fenno-Swedish Quantity: Contrast in Stratal OT. In *Rules, Constraints, and Phonological Phenomena*, Andrew Nevins & Bert Vaux, eds., Oxford: Oxford University Press.

Kroch, Anthony, Ann Taylor, & Don Ringe (2000) The Middle English verb-second constraint: A case study in language contact and language change. In *Textual parameters in older language*, S. Herring, P. van Reenen, & L. Schoesler, eds., Amsterdam: John Benjamins, 353–391.

Kuryłowicz, Jerzy (1964) *The Inflectional Categories of Indo-European*. Heidelberg: Carl Winter Universitätverlag.

Ladefoged, Peter & Ian Maddieson (1996) *The Sounds of the World's Languages*. Oxford: Blackewell.

Lagos, Daniel (1981) El Estrato Fónico del Mapudungu. *Nueva Revista del Pacífico* **19-20**: 42–66.

Lahiri, Aditi & B. Elan Dresher (1999) Open Syllable Lengthening in West Germanic. *Language* **75**(4): 678–719.

Lahiri, Aditi & Paula Fikkert (1999) Trisyllabic shortening in English: past and present. *English Language and Linguistics* **3**(2): 229–267.

Lahiri, Aditi, Tomas Riad, & Haike Jakobs (1999) Diachronic Prosody. In van der Hulst, 335–422.

Laing, Margaret & Roger Lass (2006) Early Middle English Dialectology. In van Kemenade and Los, 417–451.

Lass, Roger (1992) Phonology and Morphology. In *The Cambridge History of the English Language Vol. II: 1066-1476*, Norman Blake, ed., Cambridge: Cambridge University Press, 23–155.

Lass, Roger (1994) *Old English: a historical linguistic companion*. Cambridge: Cambridge University Press.

Lehiste, Ilse (1970) *Suprasegmentals*. Cambridge, MA: MIT Press.

Lenz, Rodolfo (1893) Beiträge zur Kenntnis des Amerikanospanischen. *Zeitschrift für Romanische Philologie* **17**: 188–214.

Lenz, Rodolfo (1895-1897) *Estudios Araucanos*, vol. XCVII. Santiago: Anales de la Universidad de Chile.

Lenz, Rodolfo (1920) *La Oración y sus Partes*. Centro de Estudios Históricos, Madrid: Revista de Filología Espñola.

Levi, Susannah (2005) Acoustic correlates of lexical accent in Turkish. *Journal of the International Phonetic Association* **35**: 73–97.

Lieberman, Mark & Alan Prince (1977) On Stress and Linguistic Rhythm. *Linguistic Inquiry* **8**(2): 249–336.

Loncón Antileo, Elisa (2005) *Morfología y Aspectos del Mapudungun*. Ph.D. thesis, Universida Autónoma Metropolitana, Mexico City.

Loncón Antileo, Elisa (2007) Las propiedades de Los afijos *-nge* y *-le* del mapudungun. *Anales de Antropología* **41**(2): 183–211.

Loos, Eugene (1973) Algunas implicaciones de la reconstrucción de un fragmento de la gramática del proto-pano. In *Estudios Panos II*, no. 11 in Lingüística Peruana, Yarinacocha, Peru: Instituto Lingüístico de Verano, 263–282.

Lutz, Angelika (1997) Sound Change, word formation and the lexicon; The history of the English Prefix Verbs. *English Studies* **78**(3): 258–290.

Marchand, Hans (1969) *The categories and types of present-day English word-formation*. Wiesbaden: Otto Harrassowitz.

Martinet, André (1954) Accents et tons. *Miscellanea Phonetica* **2**: 13–24.

Martinet, André (1964) *Elements of General Linguistics*. Chicago: Chicago University Press.

McCarthy, John J (2003) OT constraints are categorical. *Phonology* **20**: 75–138.

McCarthy, John J & Alan Prince (1986) Prosodic Morphology, ms. Universy of Massachusetts, Amherst and Brandeis University.

McCarthy, John J & Alan Prince (1990) Foot and Word in Prosodic Morphology: The Arabic Broken Plural. *Natural Language and Linguistic Theory* **8**(2): 209–283.

McCully, C. B. & Richard Hogg (1990) An account of Old English stress. *Journal of Linguistics* **26**(2): 315–339.

McGarrity, Laura (2003) *Constraints on patterns of primary and secondary stress*. Ph.D. thesis, Indiana University.

McMahon, April (2000) *Lexical Phonology and the History of English*. Cambridge: Cambridge University Press.

MED (2001) *Middle English Dictionary*. Michigan: University of Michigan.

Melinger, Alissa (2002) Foot structure and accent in Seneca. *International Journal of American Linguistics* **68**(3): 287–315.

Minkova, Donka (1991) *The History of Final Vowels in English*. Berlin: Mouton de Gruyter.

Minkova, Donka (1997) The credibility of Pseudo-Alfred: prosodic insights in post-conquest mongrel meter. *Modern Philology* **94**(4): 427–454.

Minkova, Donka (2003) *Alliteration and Sound Change in Early English*. Cambridge: Cambridge University Press.

Minkova, Donka (2006) Old and Middle English Prosody. In van Kemenade and Los, 95–124.

Minkova, Donka (2008) Prefixation and stress in Old English. *Word Structure* **1**(1): 21–52.

Minkova, Donka & Robert Stockwell (2008) Phonology: segmental histories. In *A Companion to the History of the English Language*, Haruko Momma & Michael Matto, eds., Oxford: Wiley-Blackwell, 29–42.

Minkova, Donka & Robert Stockwell (2009) *English Words: History and Structure*. Cambridge: Cambridge University Press, secons ed.

Mitchell, Bruce (1978) Prepositions, adverbs, prepositional adverbs, postpositions, separable prefixes or inseparable prefixes in Old English. *Neuphilologische Mitteilungen* **79**: 240–257.

Moesbach, Ernesto Wilhelm de (1962) *Idioma Mapuche*. Padre Las Casas: Editorial San Francisco.

Mohanan, Karuvannur Puthanveettil (1985) *The Theory of Lexical Phonology*. Dordrecht: Reidel.

Molineaux, Benjamin J. (2012) Prosodically conditioned morphological change: preservation vs loss in Early English prefixes. *English Language and Linguistics* **16**(03): 427–458.

Morris, Richard (1868) *Chaucer's translation of Boethius' De Consolatione Philosophiae*. London: Early English Text Society.

Morse-Gagne, Elise (2003) *Viking pronouns in England: Charting the course of THEY, THEIR, and THEM*. Ph.D. thesis, University of Pensylvania.

Nanni, Debbie L. (1977) Stressing words in *-ative*. *Linguistic Inquiry* **8**(4): 752–763.

Nater, Frank H. (1984) *The Bella Coola Language*. Ottawa: National Museums of Canada.

Newman, Stanley (1947) Bella Coola I: Phonology. *International Journal of American Linguistics* **13**: 129–134.

OED (1989) Oxford English Dictionary Online, 2nd Edition, www.oed.com, Oxford University Press, accessed 25 January 2014.

Ogura, Michiko (1995) The interchangeability of Old English verbal prefixes. *Anglo Saxon England* **24**: 67–93.

O'Keefe, Michael (2007) Phonetic correlates of stress in Mapudungun, handout Rutgers University.

Oltra-Massuet, Isabel & Karlos Arregi (2005) Stress-by-Structure in Spanish. *Linguistic Inquiry* **36**(1): 43–84.

Oswalt, Robert (1961) *A Kashaya Grammar (Southwestern Pomo)*. Ph.D. thesis, University of California, Berkeley, CA.

Oswalt, Robert (1988) The floating accent in Kashaya. In *In Honor of Mary Haas*, William Shipley, ed., Berlin: Mouton de Gruyter, 611–622.

Payne, David L. (1984) Sobre el desarrollo histórico de los sufijos de referencia cruzada del mapudungun. In *Actas Jornada de Lenguas y Literatura Mapuche.*, vol. 5, Temuco: Universidad de la Frontera / Instututo Lingüístico de Verano, 1–17.

Peña, Marcela, Ricardo A. H. Bion, & Marina Nespor (2011) How modality specific is the Iambic-Trochaic Law? Evidence from vision. *Journal of Experimental Psychology: Learning, Memory, and Cognition* **37**(5): 1199–1208.

Peperkamp, Sharon & Emmanuel Dupoux (2002) A typological study of stress 'deafness'. In *Laboratory Phonology 7*, Carlos Gussenhoven & N Warner, eds., Berlin: Mouton de Gruyter, 203–240.

Plag, Ingo, Gero Kunter, Sabine Lappe, & Maria Braun (2008) The role of semantics, argument structure, and lexicalization in compound stress assignment in English. *Language* **84**(4): 760–794.

Poussa, Patricia (1982) The evolution of early Standard English: the creolization hypothesis. *Studia Anglia Posnaniensia* **14**: 70–85.

Prince, Alan (1983) Relating to the grid. *Linguistic Inquiry* **14**: 19–100.

Prince, Alan & Paul Smolensky (1993) Optimality Theory: constraint Interaction in Generative Grammar, (Published 2004, Oxford: Wiley-Blackwell).

Prokosch, Edward (1939) *A Comparative Germanic Grammar*. Philadelphia: University of Pensylvania Press.

Quirk, Randolph & C. L. Wrenn (1957) *An Old English Grammar*. Methuen's Old English Library, London: Methuen & Co., second ed.

Revithiadou, Anti (2011) The Prosodic Word. In van Oostendorp *et al*, 1204–1227.

Ringe, Don (2006) *From Proto-Indo-European to Proto-Germanic*. Oxford: Oxford University Press.

Rivano, Emilio (1989) Persons, Interactions, Proximity and Metaphorical Grammaticalization in Mapundungu. *Lund University Department of Linguistics Working Papers* **35**: 149–168.

Rivano, Emilio (1990) Notes on the feature matrix for Mapudungun vowels and related issues. *Revista de Lingüística Teórica y Aplicada* **28**: 135–145.

Roca, Iggy (2005) Saturation of parameter setting in Spanish stress. *Phonology* **22**(3): 345–394.

Rojas Carrasco, Guillermo (1940) *Filología chilena: guía bibliográfica y crítica*. Santiago: Ediciones Universidad de Chile.

Rondón, Víctor (1999) Música y evangelización en el Cancionero Chilidúgú (1777) del Padre Havestadt, Misionero Jesuita en la Araucanía durante el Siglo XVIII. In *Los Jesuitas españoles expulsos : su imagen y su contribución al saber sobre el mundo hispánico en la Europa del siglo XVIII. Actas del Coloquio Internacional de Berlín (7-10 de abril de 1999)*, Manfred Tietz & Dietrich Briesemeister, eds., Madrid: Iberoamericana.

Russom, Geoffrey (1998) *Beowulf and Old English Meter*. Cambridge: Cambridge University Press.

Sadowsky, Scott (2012a) El sistema vocálico chileno: ¿Español con sonidos araucanos? *Talk given at IV Congreso Internacional de Lenguas y Literaturas Indoamericanas / XV Jornadas de Lengua y Literatura Mapuche* .

Sadowsky, Scott (2012b) *Naturaleza fonética y estratificación sociolingüística de los alófonos vocálicos del castellano de Concepción (Chile)*. Ph.D. thesis, Universidad de Concepción, Concepción.

Sadowsky, Scott (2013) La influencia del mapudungun en el castellano de Chile: el caso de las vocales. *talk given at the III Encuentro de Lenguas Indígenas Americanas* .

Sadowsky, Scott, Héctor Paniqueo, Gastón Salamanca, & Heriberto Avelino (2013) Mapudungun. *Journal of the International Phonetic Association: Illustration of the IPA* **43**(1): 87–96.

Sadowsky, Scott & Gastón Salamanca (2011) El inventario fonético del español de Chile: principios orientadores, inventario provisorio de consonantes y sistema de representación (AFI-CL). *Onomazein* **24**(2): 61–84.

Salamanca, Gastón (1997) Fonología del pehuenche hablado en el Alto Bío-Bío. *Revista de Lingüística Teórica y Aplicada* **35**: 113–124.

Salamanca, Gastón & Elizabeth Quintrileo (2009) El mapuche hablado en Tirúa: fonemas segmentales, fonotaxis y comparación con otras variedades. *Revista de Lingüística Teórica y Aplicada* **47**(1): 13–35.

Salas, Adalberto (1976) Esbozo fonológico del mapuθuŋu, lengua de los mapuche o araucanos de Chile central. *Estudios Filológicos* **11**(143–153).

Salas, Adalberto (1978a) Mapuche-Español: Análisis fonológico contrastivo. *Vicus: Cuadernos de Lingüística* **II**: 57–86.

Salas, Adalberto (1978b) Terminaciones y transiciones en el verbo mapuche: Crítica y bases para una nueva interpretación. *Revista de Lingüística Teórica y Aplicada* **16**: 167–179.

Salas, Adalberto (1979) *Semantic Ramifications of the Category of Person in the Mapuche Verb*. Ph.D. thesis, State University of New York, Buffalo, NY.

Salas, Adalberto (1980) La lingüística mapuche en Chile. *Revista de Lingüística Teórica y Aplicada* **18**: 23–57.

Salas, Adalberto (1985) Fray Félix José de Augusta: Su aporte a los estudios de la lengua y la cultura de los mapuches o araucanos. *Cultura, Hobre, Sociedad (CUHSO)* **2**(2): 197–272.

Salas, Adalberto (1996) El Indigenismo Romántico. Exámen Etnolingüístico de un Retórica en torno al Quinto Centenario. *Onomazein* **1**: 139–151.

Salas, Adalberto (2003) Lingüística Mapuche, Guía Bibliográfica, biblioteca Virtual Universal www.biblioteca.org.ar/libros/8854.pdf.

Salas, Adalberto (2006) *El Mapuche o Araucano*. Santiago: Centro de Estudios Públicos (CEP).

Samuels, Michael L. (1972) *Linguistic Evolution*. Cambridge: Cambridge University Press.

Sánchez, Gilberto (1989) Relatos orales en pewenče chileno. In *Estudios en Honor a Yolando Pino Saavedra*, Santiago: Anales de la Universidad de Chile.

Sapir, Edward (1921) *Language; An introduction to the study of speech*. New York, NY: Harcourt.

Scheer, Tobias (2008) A lateral theory of phonology (vol. 2). How morpho-syntax talks to phonology: a survey of extra-phonological information in phonology since Trubetzkoy's Grenzsignale (Unpublished Ms), university of Nice.

Schütze, Carson (1996) *The Empirical Base of Linguistics: Grammaticality Judgments and Linguistic Methodology*. Chicago, IL: University of Chicago Press.

Sedgefield, Walter (1899) *King Alfred's Old English version of Boethius' De Consolatione Philosophiae*. Oxford: Clarendon.

Selkirk, Elizabeth (2003) The prosodic structure of function words. In *Optimality Theory in Phonology: A reader*, John J McCarthy, ed., Oxford: Blackwell.

Sievers, Eduard (1893) *Altgermanische Metrik*. Halle: Max Niemeyer.

Smeets, Ineke (2008) *A Grammar of Mapuche*. Berlin: Mouton de Gruyter.

Soto, Guillermo & Felipe Hasler (2010) La no vigencia en el momento de habla: sobre la posibilidad del anti-perfecto como categoría gramatical. In *La renovación de la palabra en el bicentenario de la Argentina. Los colores de la mirada lingüística*, M. Castel & Liliana Cubo de Severino, eds., Editorial FFyL UNCuyo, 1265–1271.

Speyer, Augustin (2010) *Topicalization and stress clash avoidance in the history of English*. Berlin: Mouton de Gruyter.

Stanley, Eric (1983) The prenominal prefix *ge-* in Late Old English and Early Middle English. *Transactions of the Philological Society* **80**(1): 25–66.

Stark, Lousa R. (1970) Mayan afinites with Araucanian. In *Papers from the Sixth General Meeting of the Chicago Lunguistics Society*, Chicago: Chicago Linguistics Society, 56–69.

Suárez, Jorge (1959) The phonemes of an Araucanian dialect. *International Journal of American Linguistics* **25**: 177–181.

Sweet, Henry (1871) *King Alfred's West-Saxon Version of Gregory's Pastoral Care*. 45, 50, London: Early English Text Society.

Szinnyei, Joseph (1912) *Ungarische Sprachlehre*. Berlin: G. J. Göschen.

Tesar, Bruce (2004) Using inconsistency detection to overcome structural ambiguity in language learning. *Linguistic Inquiry* **35**(2): 219–253.

Thomason, Sarah Grey & Terence Kaufman (1988) *Language Contact, Creolization, and Genetic Linguistics*. Berkeley, CA: University of California Press.

Toon, Thomas E. (1992) Old English dialects. In Hogg, *The Cambridge History of the English Language Vol. I*, 409–451.

Toribio Medina, José (1894) Noticia Biográfica. In *Doctrina Cristiana y Catecismo con un Confesionario, Arte y Vocabulario Breves en Lengua Allntiac*, Fr. Luis de Valdivia, ed., Imprenta de E. Rasco, 1–42.

Toribio Medina, José (1897) Prólogo. In *Nueve sermones en lengua de Chile por el P. Luis de Valdivia: reimpresos a plana y renglón del único ejemplar conocido y precedidos de una Bibliografía de la misma lengua*, José Toribio Medina, ed., Santiago: Imprenta Elzeviriana, VII–XVI.

Tovar, Antonio & Consuelo Larrucea (1984) *Catálogo de las lenguas de América del Sur*. Madrid: Gredos.

Trips, Carola (2002) *From OV to VO in Early Middle English*. Amsterdam: John Benjamins.

Trommelen, Mieke (1983) *The syllable in Dutch: with special reference to the diminutive formation*. Dordrecht: Foris.

Trommelen, Mieke & Wim Zonneveld (2008) English. In *Word Prosodic Systems in the Languages of Europe*, Harry van der Hulst, ed., chap. 8 Wordstress in West-Germanic and North-Germanic Languages, Mouton de Gruyter, 478–491.

Trubetzkoy, Nikolai (1939) *Grundzüge der Phonologie*. Prague: Vandenhoeck and Ruprecht.

Tryon, D. T. (1970) *An Introduction to Maranungku (Pacific Linguistics Series B, #14)*. Canberra: Australian National University.

Valdivia, Father Luis (1606) *Arte, y Gramatica General de la Lengua que Corre en Todo el Reyno de Chile, con un Vocabulario y Confessionario*. Seville: Thomás López de Haro.

Valdivia, Fr. Luis de (1621) *Sermón en la Lengua de Chile, de los misterios de nuestra fé catholica, para predicarla a los indios infieles del Reyno de Chile, dividido en nueve partes pequeñas de acuerdo a su capacidad.* Valladolid.

van Coetsem, Franz (1996) *Towards a typology of lexical accent: stress accent and pitch accent in a renewed perspective*. Heidelberg: Carl Winter Universitätsverlag.

van der Gaaf, W. (1930) The passive of a verb accompanied by a preposition. *English Studies* **12**(1): 1–24.

van der Hulst, Harry (1999a) Word Accent. In van der Hulst, 3–115.

van der Hulst, Harry, ed. (1999b) *Word Prosodic Systems in the Languages of Europe*. Berlin: Mouton de Gruyter.

van der Hulst, Harry (2010) A note on recursion in phonology. In *Recursion and Human Language*, Harry van der Hulst, ed., chap. 17, Berlin: Mouton de Gruyter, 301–342.

van der Hulst, Harry, ed. (forthcoming) *Word Stress: Theoretical and Typological Issues*. Cambridge: Cambridge University Press.

van Kemenade, Ans & Bettelou Los (2003) Particles and prefixes in Dutch and English. In *Yearbook of Morphology 2003*, Geert Booij & Jaap van Marle, eds., Dordrecht: Kluwer Academic Publishers, 79–117.

van Kemenade, Ans & Bettelou Los, eds. (2006) *The Handbook of the History of English*. Oxford: Wiley-Blackwell.

van Oostendorp, Marc, Colin Ewen, Elizabeth Hume, & Keren Rice, eds. (2011) *The Blackwell Companion to Phonology*. Oxford: Wiley-Blackwell.

Varga, Lázló (1994) Rhythmic Stress Alternation in Hungarian. *The Even Yearbook* : 233–254.

Varga, Lázló (2002) *Intonation and stress : evidence from Hungarian*. London: Palgrave MacMillan.

Vogel, Irene (2001) The phonological word and stress assignment in Turkish. *Phonology* **18**: 315–360.

von Humboldt, Wilhelm (1836) *Über die Verschiedenheit des menschlichen Sprachbaues und ihren Einfluss auf die geistige Entwickelung des Menschengeschlechts*. Berlin: Druckerei der Königlichen Akademie der Wissenschaften.

Weerman, Fred (1989) *The V2 Conspiracy: Synchronic and Diachronic Analysis of Verbal Positions in Germanic Languages*. Dordrecht: Foris.

Werker, Janet & Richard Tees (1984) Phonemic and phonetic factors in adult cross-language speech perception. *Journal of the Acoustical Society of America* **75**: 1866–1878.

Wessén, E. (1958) *Svensk språkhistoria II: Ordbildning.* Stockholm: Almqvis & Wiksel.

Wetterlin, Allison, Elisabet Jönsson-Steiner, & Aditi Lahiri (2007) Tones and loans in the history of Scandinavian. In *Tones and Tunes: Typological studies in word and sentence prosody*, vol. 1, Tomas Riad & Carlos Gussenhoven, eds., Berlin: Mouton de Gruyter, 353–376.

Wrenn, C. L. (1933) "Standard" Old English. *Transactions of the Philological Society* **32**: 65–88.

Zúñiga, Fernando (2000) *Mapudungun*. Munich: LINCOM.

Zúñiga, Fernando (2001) Escribir en Mapudungun: Una nueva propuesta. *Onomazein* **6**: 263–279.

Zúñiga, Fernando (2006a) Mapudungan. In *Encyclopedia of Language and Linguistics*, Keith Brown, ed., Oxford: Elsevier, 487–488.

Zúñiga, Fernando (2006b) *Mapudungun: El habla mapuche*. Santiago: Centro de Estudios Públicos (CEP).

Zúñiga, Fernando (2007a) *Mapudunguwelaymi am?* '¿Acaso ya no hablas mapudungun?' Acerca del estado actual de la lengua mapuche. *Estudios Públicos* : 9–24.

Zúñiga, Fernando (2007b) A sketch of Mapudungun Phonology, unpublished Ms. available at http://zuniga.unibe.ch/down/Mapu-phon.pdf.

Zúñiga, Fernando (2010) Benefactive and malefactive applicativization in Mapudungun. In *Benefactives and malefactives: typological perspectives and case studies*, Fernando Zúñiga & F. Kittlä, eds., Amsterdam: John Benjamins, 203–218.

Zúñiga, Fernando (to appear) An exploration of the diachrony of Mapudungun valency-changing operations.

Zwartjes, Otto (2000) Modo, tiempo y aspecto en las gramáticas de las lenguas mapuche, millcayac, y guaraní de Luis de Valdivia y Antonio Ruiz de Montoya: La categoría de los tiempos mixtos. In *Las gramáticas misioneras de tradición hispánica (Siglos XVI-XVII)*, Otto Zwartjes, ed., Amsterdam/Atlanta GA: Rodopi, 205–256.