



ResearchSpace@Auckland

Journal Article Version

This is the publisher's version. This version is defined in the NISO recommended practice RP-8-2008 <http://www.niso.org/publications/rp/>

Suggested Reference

Brown, J. (2015). The Minimal Phonological Phrase: Evidence from Māori. *Oceanic Linguistics*, 54(2), 507-533. doi:[10.1353/ol.2015.0028](https://doi.org/10.1353/ol.2015.0028)

Copyright

Items in ResearchSpace are protected by copyright, with all rights reserved, unless otherwise indicated. Previously published items are made available in accordance with the copyright policy of the publisher.

<http://www.sherpa.ac.uk/romeo/issn/0029-8115/>

<https://researchspace.auckland.ac.nz/docs/uoa-docs/rights.htm>



PROJECT MUSE®

The Minimal Phonological Phrase: Evidence from Māori

Jason Brown

Oceanic Linguistics, Volume 54, Number 2, December 2015, pp. 507-533
(Article)



Published by University of Hawai'i Press
DOI: [10.1353/ol.2015.0028](https://doi.org/10.1353/ol.2015.0028)

➔ For additional information about this article

<http://muse.jhu.edu/journals/ol/summary/v054/54.2.brown.html>

The Minimal Phonological Phrase: Evidence from Māori

Jason Brown

UNIVERSITY OF AUCKLAND

This paper draws on the rich discussion surrounding the structural notion of the phrase in Māori, and extends that discussion by arguing that there is evidence for a minimal Phonological Phrase in the language. While minimality effects in phonology have been demonstrated for many languages, they are often manifested as a lower limit on the possible Prosodic Word—typically either a disyllabic or a bimoraic structure. This paper presents evidence from Māori that minimality effects involve structures in the prosodic hierarchy that are larger than the Prosodic Word. The analysis of the minimal Phonological Phrase relies on a condition that forces prosodic categories to branch. In most contexts where this condition is in danger of being violated, there is augmentation by an initial phrase particle; however, in contexts where singular personal pronouns are in subject position, these are phonologically incorporated into the preceding phrase.

1. INTRODUCTION.¹ There is a rich tradition of research centered around the structural notion of the phrase in Māori and other Polynesian languages. In the context of this tradition, the present work aims to provide an explanation for alternations such as the following²:

- (1) Phonological augmentation with [e]
a. maranga! ‘arise!’
b. e noho! ‘sit!’

As illustrated in (1), one form of the imperative construction in Māori appears to exhibit phonological augmentation (1b). As noted by Biggs (1998:65–66), Bauer (1993),

1. Thanks to Winifred Bauer, Chris Golston, Zoe Lippsett, Francis McWhannell, Miriam Meyerhoff, Sally Nicholas, Forrest Panther, Liz Pearce, Eric Potsdam, Te Whainoa Te Wiata, two anonymous reviewers, and John Lynch for detailed comments on the material presented here, as well as participants at the Ninth Conference on Oceanic Linguistics (Newcastle, Australia) and audience members at the University of Auckland and the University of Georgia. This research is supported by a University of Auckland FRDF grant (“Exploring Syllable Structure in Pacific Languages”). All errors are my own.
2. Throughout the history of Māori linguistics, different orthographic and representational conventions have been employed. Examples presented here abide by the orthographic system whereby underived long vowels are indicated with a macron over the vowel and derived long vowels are indicated with a doubling of the vowel symbol. Examples in this paper have been harmonized in this fashion, even if data cited from original sources use a different convention. Morpheme glosses are faithful to the original source (sometimes resulting in incongruent glosses, and even spellings).

and Harlow (2001, 2007), verbal bases with two vowels (that is, bimoraic bases) make use of the phrase-initial augment *e*. Vocative constructions and numerals behave in the same fashion, whereby bases that are larger than two moras do not employ the phrase-initial augment *e*. This paper will argue that the pattern in (1) constitutes a genuine case of phonological augmentation, where a phonological category that is too “small” is augmented in order to meet a minimal threshold. This paper makes a novel claim about phonological theory: that rather than the typical minimal word effects, which are ubiquitous in languages, the pattern illustrated in (1) is the result of satisfying a minimal size requirement on Phonological Phrases. This claim is in part supported by a similar pattern found in Rarotongan and Tahitian, as well as a potentially similar pattern in Ifira-Mele.

This paper will aim to provide an account of the minimality effect, claiming that the restriction is on structures larger than the word. Formally speaking, in order to reach an acceptable minimal structure, a phrase must *surpass* the regular word minimality by means of branching at a particular prosodic level (the phrase or the word). Since the minimal word is bimoraic, this additional branching requirement results in trimoraic structures.

It is important to note at the outset that many of the arguments presented below are not novel; indeed, many have been made in some form in the past by various authors. The contribution made in this paper is in the unification of several different arguments, a tightening up of the overall phonological analysis of the phrase, the introduction of some new arguments and data, and, ultimately, in making the case for a minimal phonological entity in theoretical terms.

The paper is structured as follows: section 2 presents data from Māori imperatives, vocatives, and numerals in order to highlight the augmentation pattern. Section 3 gives some background on the notion of the phrase in Māori, while in section 4, I advance the role that this category is argued to play in the prosodic hierarchy and provide supporting language-internal evidence. This evidence includes the behavior of the smallest phrases, the role that suffixes and particles play in phrasal phonology, and the prosodic incorporation exhibited by some pronominals. Section 5 provides supporting evidence from within the Polynesian family, including imperative patterns in Rarotongan and Tahitian, as well as citation forms in Ifira-Mele. Section 6 discusses related issues, including the phonology of younger Māori speakers and sets of particles that alternate; section 7 concludes.

2. AUGMENTATION PATTERNS. This section aims to outline the basic conditions on phonological augmentation in Māori, expanding on the basic pattern illustrated in (1). This includes the behavior of the hypothesized phrase-initial augment *e* in imperative, vocative, and numeral constructions.

2.1 IMPERATIVES. In Māori, one form of the imperative relies on the apparent insertion of a particle. As noted by Biggs (1998:65–66), Bauer (1993:30–32, 36), and Harlow (2001:146, 216–17), universal bases—roughly speaking, verbal stems in this case—with two vowels surface with the phrase-initial particle *e* in imperatives (data from Biggs 1998):

(2) e tū!	‘stand!’	e noho!	‘sit!’
e ara!	‘get up!’	e moe!	‘go to sleep!’
e oho!	‘wake up!’	e kai!	‘eat’

In contrast, bases larger than two vowels (or a single long vowel) do not employ *e* phrase-initially:

(3) maranga!	‘arise!’	takoto!	‘lie down!’
tomo mai!	‘come in!’	karanga atu!	‘call!’
haere mai!	‘come here (welcome)!’	haere atu!	‘go away!’
whakarongo!	‘listen!’	titiro mai!	‘look here!’
haere koe!	‘you go!’		

It will be assumed henceforth that a single short vowel will be monomoraic and a long vowel bimoraic; the representations based on these assumptions will be discussed in more detail in section 4. With this in mind, Harlow (2007:140) notes that, with respect to the patterns in (2) and (3), “the allomorphy is phonologically conditioned: \emptyset is chosen if the verb, along with any postposed particles, exceeds two morae in length, otherwise *e*.” This is clearly evident in forms where both alternants are present, such as: *E noho! E tū! Haere!* ‘Sit! Stand! Go!’ (Harlow 2001:134). This generalization forms the basis for the present work.³

On the face of it, it is tempting to posit a construction-specific condition that states that imperative phrases must be larger than two moras. In this context, though, it should be noted that there are other imperative constructions that do *not* alternate. For instance, transitive imperatives, which employ the passive form of the verb, and, thus, by extension have a verbal stem that exceeds two moras, do not exhibit alternations with *e*:

(4) Patu-a te kurī rā!	
beat-PASS the dog DIST	
‘Beat that dog!’	(Bauer 1993:32)

The fact that verbal bases that are bimoraic (as in 4) surface without the augment results from the fact that the passive suffix adds the phonological material needed to meet the prescribed trimoraic minimum. Biggs (1994:85–86) notes that the only other context without phrase-initial particles in verbal phrases (his discussion includes imperatives) is when there is a particle in the postposed periphery of the phrase (excluding *rā* ‘intensive’). Thus, augmentation will only occur in a subset of imperative forms. Furthermore, a construction-specific approach would be ad hoc for other reasons. As Bauer (1993) points out, this pattern is not restricted to the imperatives, but is also found with vocatives and with numerals. The patterns as they relate to these two constructions will be outlined in turn below.

2.2 VOCATIVES. Vocatives in Māori exhibit a behavior parallel to the imperatives, whereby the augment *e* is used with bimoraic bases (data from Bauer 1993:31):

(5) a. Haere atu, e Mere!
move away VOC ⁴ Mary
‘Go, Mary!’

3. The generalization has been formulated elsewhere, as well; cf. in particular Bauer (1993) and the discussion that follows.

4. The gloss for the augment has been kept as it appears in original sources, despite the claim advanced here that it is semantically devoid of content in these contexts.

- b. E oho, Tamahae!
 IMP wake Tamahae
 ‘Wake up, Tamahae!’

Note again that names that are only bimoraic are augmented with the particle *e* (5a), while names that are larger than two moras receive no augmentation (5b). Note also that the imperative alternation between *e*/∅ is further illustrated in these examples.

2.3 NUMERALS. Some uses of the numerals in Māori also exhibit the augmentation pattern (Best 1906; Bauer 1993:495; Biggs 1998:142). When uttered in isolation (as in counting⁵), each of the numerals up to nine makes use of the augment *e* except for the numeral ‘one’, which surfaces as *kotahi*. This suggests that the prefixed material is an augment, and semantically inert.⁶ The numerals up to nine are presented below for reference.

- (6) Numerals to 9: tahi, rua, toru, whā, rima, ono, whitu, waru, iwa
 (Biggs 1998:142)

It is no accident that each of these forms is exactly bimoraic, and no larger. In contrast, the word for ten, *tekau*, which is trimoraic, does not take the augment.

As a piece of supporting evidence, the ordinal forms, which make use of the determiner *te*, do not make use of the particle (7a), nor do forms using the “human” prefix *toko-* (7b):

- (7) a. *te tahi* ‘the first’, *te rua* ‘the second’, etc. (Biggs 1998:143)
 b. *Tokohia nga tangata? Tokorima.*
 ‘How many people? Five.’ (Biggs 1998:143)

This again illustrates the point that the appearance of the augment is phonological in nature, and not morphosyntactic. The pattern in (6) indicates that the restriction affects bimoraic structures, and the forms in (7) illustrate the point that when other particles/affixes are present, the need for the augment disappears.

2.4 DISCUSSION. It is tempting to consider this particle *e* as the same morpheme that occurs in the actor-emphatic construction⁷ (Waite 1990), as in example (8), or as a form of the homophonous tense/aspect marker *e* in example (9).

5. Winifred Bauer (pers. comm.) notes that the augment is not necessarily used with consistency in counting, and that speakers may begin with an augment—for example, *ka tahi, ka rua ...*—especially if the focus of the discourse is on the process of counting (as, for example, in teaching a child to count); however, in rapid counting, the augments are usually elided entirely, or elided after the first few numerals.

6. Best (1906:151) states that “these terms are often used when counting. But an ancient, and more correct, style of actual enumeration is by prefixing *ka* to the numerals.” The fact that different particles have been available for this function supports the idea that the prefixed particle is an augment, and semantically inert. Further support for the position that *e* lacks semantic content in these contexts comes from an anecdotal observation by Barton (2008:43), who states that “second language Maori speakers usually use the particle *e* in front of numbers, but often otherwise treat numbers as they are treated in English. In the mathematics classroom this is particularly true. When this happens the *e* makes no sense except that ‘it sounds right!’”

7. Brown and McWhannell (to appear) provide numerous examples of tense/aspect markers used in imperatives in Polynesian. Thus, the tense marker *e* could have very likely been a diachronic source for the present-day augment.

- (8) Ma Pita e tīhore Ø te hipi.
 for.GEN Pita TNS skin NOM DET sheep
 ‘Peter will skin the sheep.’ (Waite 1990:395)
- (9) E moe ana te peepi.
 T/A sleep T/A the baby
 ‘The baby is sleeping.’ (Bauer 1993:421)

However, Bauer (1993:31) makes the convincing case that the *e* used in imperatives is distinct. The primary argument is that the distribution of *e* in imperatives is governed by the mora count of the base, whereas in other syntactic contexts the prosodic structure of the base does not trigger the alternation. In addition, *e* can be used with numerals in past tense contexts, but the tense/aspect marker *e* marks nonpast events, casting doubt on augmentative *e* being the same as the nonpast tense marker. Also, as Bauer has pointed out, the *e* in imperatives exhibits the same phonological behavior with the vocatives and with numerals, which was outlined above. Finally, *e* is also the augment that is used in poetry when a line needs to be lengthened. Some traditional Māori songs (*waiata*) make use of strict eight mora-count half-lines (Biggs 1980; McLean 1982); *e* is used as an augment in these to control for meter. In sum, Bauer is worth quoting at length here, making the point that there is evidence that *e* is not syntactic in nature, and is the result of phonological pressures: “Where no specific phrase-type marker is required, if the phrase has fewer than three morae, *e* fills the empty slot, thus preserving the minimum phonological form. It thus appears probable that it has the same function in all these instances—it is a rhythmic filler” (1993:31).

The present work aims to expand on this important idea, and to highlight what the implications of this augmentation are for conceptions of the prosodic hierarchy in phonology, and for phonological theory in general.

3. THE PHRASE IN MĀORI. The overall argument of this paper is that there exists a minimal phonological phrase in Māori, whereby the specific object PHONOLOGICAL PHRASE (hereafter “P-Phrase”) is a genuine unit existing on the prosodic hierarchy. While there is a rich background on the syntactic status of phrases in the language, the goal of this section is to provide independent evidence for the existence of the P-Phrase, which closely corresponds with the syntactic phrase. The characteristics of P-Phrases are: they group smaller structures (that is, Prosodic Words); they are in turn organized into larger Intonation Phrases; and they constitute a domain of rule application.

There is a rich research tradition focusing on the “phrase” in Māori and other Polynesian languages. This tradition goes back at least to Biggs (1960, 1961, 1973; cf. Mutu 1989 for a historical and sociological overview of research on the phrase). This literature includes a great deal of syntactic work, but also some phonological work. A noteworthy recent study is by Pearce (to appear), who attempts to unify the syntactic and phonological properties of the phrase, including some of the patterns presented here. Pearce collects several different diagnostics for phrasehood, including phonological criteria, which provide an important basis for the study at hand.

Essentially, a phrase in Māori consists of a base plus minor morphemes that can precede or follow the base. Biggs (1960, 1961) terms this structure the “contour word.”⁸ The

contour word fits into the idea of phonological phrasing in that it is made up of smaller constituent Prosodic Words; cf. the discussion in Bauer (1993) for internal evidence for the status of the Prosodic Word. Bases are typically roots, which meet the threshold for minimal Prosodic Words (this will be fleshed out further in section 4). Minor morphemes are usually grammatical morphemes, are exempt from the minimality threshold on Prosodic Words, and are allowed to fall below this; however, they are not clitics in the traditional sense, as they are not inherently directional. Instead, they are grammatical morphemes that have a phonological existence as particles. In some instances, minor morphemes can serve as bases for the contour word/phrase.

A phrase consists of an obligatory nucleus, which corresponds to the concept of the head of the phrase. The nucleus is most typically a major morpheme (that is, a lexical base) and can occur with optional preposed and postposed peripheries in a phrase,⁹ the template for which would be: phrase = (preposed periphery) + nucleus + (postposed periphery). This structure is illustrated with an example:¹⁰

(10) Schematic of phrasal structure

PRE	NUC	POST	PRE	NUC	PRE	PRE	NUC
E	kai	ana	a	Mere	i	ngā	koura
T/A	eat	T/A	PERS	Mary	DO	the.PL	crayfish

‘Mary is eating the crayfish.’

(Bauer 1993:267)

There are numerous syntactic diagnostics for the phrase in Māori, but there are some phonological ones as well. The fact that Prosodic Words are organized into P-Phrases is evident in that phrases are the units where the possibility exists of being bounded by pauses (Biggs 1971, 1998; Bauer 1993; de Lacy 2003; Harlow 2007). Likewise, within those bounds, there is typically a single prominence characteristic of phrasal stress (Biggs 1969, 1971, 1998; Schütz 1985; Bauer 1993:576; Harlow 2001, 2007; de Lacy 2003). Phrasal stress in the language is different for sentence-final and nonfinal phrases, and can be characterized as follows (formulation and examples are from Harlow 2001:16). In final phrases, phrase stress placement is where word stress would normally fall on the last base; in nonfinal phrases, the penultimate mora of the phrase is stressed. Harlow notes how this can result in different stresses for the same word (*ātaahua* ‘beautiful’) in different phrases:

(11) Nonfinal phrase stress:

He marae **ātaa' hua** a Tūrangawaewae.
 ‘Tūrangawaewae is a beautiful *marae*.’

(12) Final phrase stress:

Haere mai ki tēnei marae tino **ā' taahua**.
 ‘Welcome to this beautiful *marae*.’

8. Bauer (1993:559fn), de Lacy (2003), and Harlow (2007) discuss how Biggs’s idea of “contour word” is equivalent to the modern conception of the phrase.

9. An important difference between the phonological phrasing assumed here and that in the work of de Lacy (2003) is the role that minor morphemes play in phrases. For de Lacy, minor morphemes are not included in P-Phrases; however, in the present study, minor morphemes play an important role in the phrase, including providing the extra phonological material when a subminimal phrase is in danger of surfacing.

10. Abbreviations used in this example are PRE, preposed; NUC, nucleus; POST, postposed.

Finally, phrases in Māori constitute a single intonation contour (Biggs 1971; Bauer 1993; de Lacy 2003). With respect to intonation, each phrase can be characterized as a contained rise and fall (Bauer 1993). Harlow (2007) and de Lacy (2003) treat the intonational structure of the phrase as being made up of a H* pitch accent on the stressed syllable of the phrase, which is followed by a boundary L- tone. De Lacy makes the point that while the presence of the H* accent may be predictable, if there were no P-Phrases, then this would leave the presence of the boundary tone unexplained (that is, the placement of the L- would be unpredictable).

Simply serving as an organizing unit for smaller prosodic units (and, likewise, being organized into higher-level prosodic units), or being characterized as a prominence along with pause boundaries, is not sufficient evidence for P-Phrase status, though. Instead, there must be substantive evidence in the form of rules. As noted above, the prominent syllable receives a H* pitch accent, which would in itself constitute a rule, as would the assignment of the boundary tone; however, the phrase in Māori is also the domain for some other phonological rules. For instance, Harlow (2007:76) notes that there is a rule of phrase-final devoicing of high vowels, such that even entire syllables can be voiceless phrase-finally (giving rise to voiceless allophones of sonorants). In addition to this phrase-final devoicing, Biggs further notes that /t/ may be palatalized before a devoiced high vowel before what he terms “final juncture” (Biggs 1961:9):

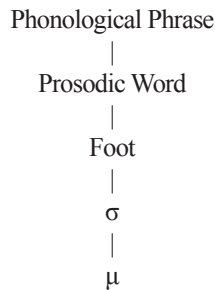
(13) /pai rawa atu / → [pairawaatʰɥ] ‘excellent’

Thus, there is evidence independent of the augmentation phenomena focused on in the present work to suggest that the P-Phrase is a genuine unit of prosody in Māori. The next step is to observe how augmentation yields well-formed phonological (though not necessarily syntactic) phrases, and where that fits into the discussion around phonological categories. The next section outlines what the implications are for a “minimal” P-Phrase.

4. THE MINIMAL PHONOLOGICAL PHRASE. While minimality effects in phonology have been demonstrated for many languages (cf. McCarthy and Prince 1986; Garrett 1999; Downing 2006); they are often manifested as a lower limit on the possible lexical word, typically either a disyllabic or a bimoraic structure. On the face of it, it appears that the phrase-initial augment illustrated in (1) and in section 2 above occurs with bimoraic structures in order to satisfy a minimality requirement in the language. While this is likely the case, it presents problems for how minimality is conceived in phonological theory. As Bauer (1981, 1993) and de Lacy (2004) have demonstrated, the canonical word-minimality requirement in Māori is a bimoraic threshold. The imperative bases already meet this requirement and, thus, would normally need no augmentation. Instead, the forms in imperatives and vocatives appear to be reaching for a trimoraic minimum. While a bimoraic structure is easily modeled in prosodic morphology as a foot (μμ), a trimoraic structure does not receive a straightforward interpretation. The primary argument of this article is that the augmentation effect in Māori is symptomatic of a “minimal phrase effect.” This section will discuss the minimal-word effect in Māori, and explain how minimal phrases can be derived from minimal words without recourse to a prosodically ad hoc trimoraic template.

The Prosodic Morphology Hypothesis (McCarthy and Prince 1986, 1990, 1993) makes the claim that all instances of “prosodic morphology” (that is, morphological operations based on phonological restrictions) operate on genuine units of prosody. Thus, morphological operations such as reduplication, truncation, templatic morphology, and minimal-word effects are based on prosodic units such as moras, syllables, feet, Prosodic Words, and so on, and not on templates that are defined in terms of consonants and vowels (that is, segmental units). Thus, prosodic morphological phenomena are free to choose genuine units of prosody—those units that exist on the prosodic hierarchy (Selkirk 1978, 1980a,b, 1981; Nespor and Vogel 1986; Hayes 1989). While there is some debate as to which units exist, the fairly uncontroversial (and abbreviated) section of the hierarchy, smaller than the Intonation Phrase, is presented below in (14).

(14) Prosodic hierarchy



The representation in (14) illustrates the point that each lower prosodic unit on the hierarchy is dominated by a larger unit. Above the level of the Prosodic Word is the P-Phrase.¹¹

The minimal-word effect that is typical of Polynesian languages—and many other Oceanic languages; cf. Blevins’s (1994) account of Rotuman as an example—is based on the bimoraic foot. The same holds true for Māori (Bauer 1981, 1993; de Lacy 2004). Under this view, minimal (lexical) words must be bimoraic, implying either a bivocalic or a bimoraic structure (regardless of consonant content; since consonants can only serve as onsets in the language, and not as codas, they cannot contribute syllable weight, and, thus, cannot contribute a mora). This requirement states that lexical words must *minimally* consist of a heavy syllable (one with a long vowel or diphthong), or two light syllables. In contrast, function words are allowed to fall below this minimum, presumably since they are incorporated into higher-level prosodic structure (cf. Selkirk 1995).

The list in (15) provides some typical lexical and function words from Māori (lexical forms from Williams 1975), highlighting the fact that lexical words must be bimoraic or larger, while function words can be monomoraic:

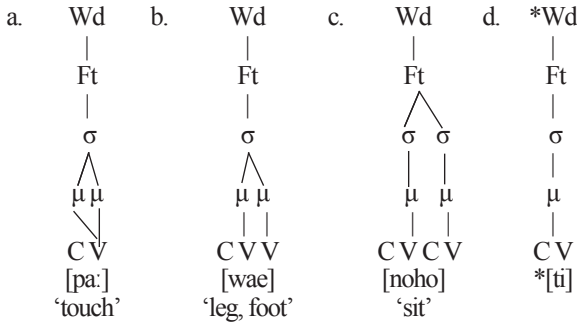
(15) Typical lexical words	Typical monosyllabic function words
hau ‘wind, air’	a proper article
iwi ‘bone’	e agentive particle
kino ‘evil, bad’	he indefinite article
kupu ‘anything said’	me ‘and’
pā ‘touch’	o subordinate poss.

11. The Intermediate Phrase is often used in prosody-based research, and is roughly interchangeable with the Phonological Phrase.

tāne	‘male’	e	nonpast
toto	‘bleed, blood’	te	‘the (SG)’
wae	‘leg, foot’	ko	focus

This is consistent with many other Polynesian languages as well: bimoraic structures constitute the lexical minimum, and monomoraic lexical words are not found. The representation for this type of minimal word, using Māori examples, is as follows:

(16) Bimoraic representation (for lexical words)



A constraint can thus be posited demanding a minimum size, such that lexical words must be bimoraic or larger. However, Ito and Mester (2003) have shown that, rather than stipulate a minimal threshold, a condition on prosodic branching can be the source of the minimal word restriction. They posit a condition (“hierarchical locality”) that allows constraints operating at a given prosodic level to have access to information at the next level down, as well as at the subjacent level. In this case, the restriction on prosodic words boils down to a restriction on feet, such that a well-formed word must be composed of a well-formed foot (Hayes 1995), as outlined above. Constraints on feet may thus have access to the syllable level, or to the moraic structure below that, which yields the bimoraic foot as the minimal word in Māori. In each case, there must be branching at the foot or the syllable level to support the existence of a well-formed prosodic word. Thus, (16a) and (16b) are well-formed prosodic words by virtue of their branching syllable structure, and (16c) is well formed due to its branching foot. In addition, the branching condition proposed here correctly rules out (16d), which exhibits no binary branching at any structural level.¹²

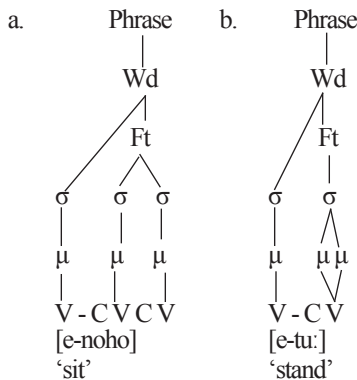
Turning back to the Māori augmentation pattern, a curiosity emerges in the representation for the augmented forms, where it is presumably the next unit higher in the hierarchy that is at stake—the P-Phrase. Instead of the lexical minimum, which is bimoraic (and arguably a foot), the augmented forms result in a *trimoraic* structure. Given the minimality requirement on lexical words discussed above, augmentation cannot be a strategy to achieve a minimal lexical word. Following a suggestion by Bauer (1993), the claim

12. To put this restriction in context, this phenomenon can be compared with the parallel case of the minimal word in English, where words must contain either a closed syllable (for example, [bit] ‘beet’, [bit] ‘bit’), or an open syllable with a tense vowel or a diphthong ([bi] ‘bee’, [bai] ‘buy’), but where words crucially cannot contain only an open syllable with a lax vowel (*[bi]). Hammond (1998, 1999) attributes this restriction to a bimoraic minimal word requirement, where tense vowels are bimoraic, but lax vowels and coda consonants are monomoraic. Thus, the same minimal word constraint must be respected in English, as well as in Māori.

advanced here is that the trimoraic minimum is a property of minimal P-phrases. For these cases, there is a minimality threshold, whereby the form must be *above* 2 moras. The challenge, to be expanded on below, is to provide an account for the augmented forms that is also consistent with unaugmented trimoraic lexical words.

The most reasonable first step in developing an analysis is to explore what the internal structure of these phrases must be. Starting with the “normal” cases of lexically trimoraic words, it is clear that these forms must have the status of Prosodic Word. If function words that are monomoraic are dependent, then they cannot be Prosodic Words, as they do not meet the minimality threshold on words. Furthermore, as Meyerhoff and Reynolds (1996) and de Lacy (2004) have demonstrated, the stress system of the language is made up of bimoraic feet, and degenerate feet are not tolerated. If degenerate feet were allowed, we would expect the minimal word to be the size of a degenerate foot (following Hayes 1995), and to bear stress. Following this line of argumentation, the augment cannot be a (degenerate) foot, and since it is metrically inert, it is not parsed to the foot level. Therefore, the augment can be parsed either directly to the Prosodic Word level, or to the P-phrase level. De Lacy (2004) provides independent evidence for the position that unfooted material in Māori is contained within the same prosodic word as footed material, with the restriction that this includes only a single unfooted syllable on each side of the foot: {ta(mai)ti} ‘child’. While this structure was posited for lexical words, the argument can be extended to the augmented forms. It is also equally plausible that particles, including the augment, are parsed directly to the P-Phrase: [e [noho]_{P-Wd}]_{P-Phrase} ‘sit!’. This structure is actually straightforward to account for, as it allows direct access to the P-Phrase level, rather than leaving the analysis to explain structures at levels *below* the P-Phrase. Because of this fact, and since augmented forms such as [e noho] are on a par with lexical words like [takoto] ‘lie down!’, then a safe assumption is that the augment is parsed directly to the Prosodic Word. This also constitutes the more difficult structure to account for, and so will be adopted here. This structure is represented in (17) below:

(17) P-Phrase representations (for augmented forms)

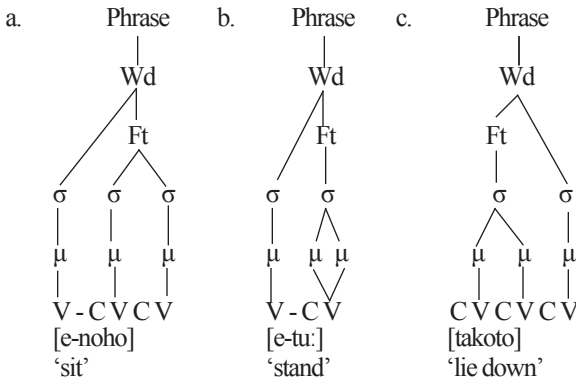


The resulting structure, as outlined above, is trimoraic. As a grammatical statement, this is in a sense undesirable, as it forces the grammar to “count” past 2 (that is, to calculate beyond a single binary foot). The number 3 does not find a natural expression in pro-

sodic morphology (or in grammars generally), so the question remains as to how to account for this unique structure. This issue will be addressed next.

While there is a substantial discussion of the minimal Prosodic Word in the literature, there is little to no discussion of minimality constraints on higher-order units in the prosodic hierarchy, including phrases.¹³ Selkirk (2000:244) notes that “it has been suggested that constraints on the minimum and maximum size of prosodic constituents are part of the universal repertoire. These size constraints assess the wellformedness of a constituent of a particular level of prosodic structure Cⁱ in terms of the number of constituents of a particular lower level Cⁱ⁻¹ that it contains.” The cases that Selkirk discusses are binary minimal conditions on phrases, whereby major phrases must be made up of at least two minor/accentual phrases. The present work seeks to extend this discussion by analyzing the minimal phrase in terms of branching conditions on lower level structure. One approach to the problem outlined here is to reinterpret the generalization as not about achieving a trimoraic target *per se*, but rather, a condition on branching, in the spirit of Ito and Mester (2003). Ghini (1993) argues convincingly that branching is not only a property of syntax, but of P-phrases, and this is essentially at the heart of the proposal argued for by Ito and Mester (2003), and outlined above for the minimality restriction on Prosodic Words in the language. This requirement would ensure that branching words, as in (18), constitute licit P-Phrases:

(18) P-Phrase representations (for all forms)



Likewise, the constraint also allows trimoraic lexical words, as in (18c), to fulfill the minimal phrase constraint, as these structures also branch (albeit unquestionably at the Prosodic Word level). Thus, a condition on branchingness captures all of the right generalizations about what can constitute a minimal word, and receives support in the fact that this is the same mechanism that accounts for minimal prosodic words (following Ito and Mester

13. Condoravdi (1990) proposes a minimal phrase, but that minimal phrase acts algorithmically to incorporate syntactic material into a larger structure. The algorithm proceeds as follows (1990:79): “a. From left to right map all material up to and including the lexical head of a maximal projection into a minimal phrase z. b. Map all unassociated material with the same maximal projection into a z.” Thus, the algorithm ensures that syntactic material is exhaustively parsed into phrases.

Likewise, when verbal bases in imperatives are followed by a directional particle, a bimoraic root is typically zero-marked, rather than augmented with *e* (cf. Harlow 2001:217).¹⁴ Compare the following forms, where the verbal root *kake* ‘climb’ is followed by the directional particle in (20), and where the particle is absent and augmentation occurs in (21).

(20) Kake mai!
 climb DIR
 ‘Climb up here!’ (Speaker is up.) (Bauer 1993:30)

(21) E kake!
 IMP climb
 ‘Climb up!’ (Speaker is not up.) (Bauer 1993:30)

The same alternation is evident in (22):

(22) a. Tū mai!
 stand DIR
 ‘Stand!’
 b. E tū!
 E stand
 ‘Stand up!’ (Harlow 2001:216–17)

Thus, under the assumption that augmentation is used to achieve a minimal phrase, the addition of the postverbal particle in (20) and (22a) and its resulting exemption from augmentation supports this view, as well as makes the point that the minimality effect is not one that simply takes the word as the relevant domain of application.

4.2 THE SMALLEST PHRASES. Corroborating evidence also comes from size restrictions on the syntactically smallest utterances and phrases. The thrust of the argument is that the syntax “conspires” to yield minimal phrases, above and beyond word minima.

Perhaps the smallest utterances are minimal answers to questions (23), which are arguably the smallest licit true phrases. As can be seen below, the answers to yes/no questions are all trimoraic or larger, with the only apparent exception to this being *pea* ‘perhaps’ (23b). In addition, a trimoraic adverbial that is used alone, bounded by punctuation, is also presented (24).

(23) Minimum answers to yes-no questions
 a. āe ‘yes’ kāō¹⁵ ‘no’
 ēhara (kē) ‘no’ taihoa ‘wait’
 b. pea ‘perhaps’ (Bauer 1993:29)

14. Bauer (1993:30) observes that “there seems to be some native speaker variation in this area.” When followed by the deictic particle *rā*, a bimoraic root is preceded by the particle *e*.

(i) E moe rā!
 IMP sleep DIST
 ‘Go to sleep!’ (Biggs 1998:65)

Harlow (2007:187, fn. 6) also notes that this particle seems to be an exception to the phrasing rule.

15. This form is *kāo* in Williams (1975). Thanks to Sally Nicholas for pointing this out to me.

- (24) **Anō!** Tōrino kau ana mai i runga i te kare o te wai...
 again glide swim PART hither at top at the ripple GEN the water
 ‘Now gliding in on the ripples of water ...’ (Bauer 1993:419)

This evidence is obviously lexical in nature, and no augmentation is involved. There are, however, also structural phenomena relating to the smallest phrases. For instance, answers to question-word questions typically involve the use of the equative or focus marker *ko*, a classifier, a determiner, and the like, with an associated nominal. For example, (25) would be a typical response to the question “Who are you?” (Bauer 1993:367):

- (25) Ko au, ko Hinemoa.
 ‘It’s me, Hinemoa.’

This is for the most part true of all phrases in the language: there is nearly always a restriction that forces bases to surface with a minor morpheme. Thus, the phrase in Māori is not typically a bare root. As Harlow (2007:140) notes, “except for those headed by personal or locative nouns or pronouns, for which there are particular patterns involving the personal article, nominal phrases are almost always introduced by some determiner or other.” Harlow notes much the same for possessive structures: “In constructions where there is no explicit possessum, then the possessive determiner constructed as sketched here forms the entire phrase.” Example (26) illustrates Harlow’s point.¹⁶

- (26) [[t-ā-ku]_{Det} Ø]_{Phrase}
 DET-P-1SG
 ‘mine’

The importance of this example is in the fact that it shows how the smallest possible nominal element (the pronominal /ku/) must be accompanied by the possessive morpheme (/ā/), yielding the by-now familiar trimoraic minimal structure. This provides fairly strong distributional (and lexical) evidence that the smallest conceivable phrases are not the smallest actual phrases.

A potential problem arises with the apparent presence of the augment in contexts of phrases larger than the bimoraic minimum. The negative imperatives in (27) and (28) below, where *e* surfaces despite the additional presence of the negative morpheme, help to illustrate the problem. This is a plausible counterexample to the theory outlined above, and also for any theory where *e* is an augment. In (27a), the bimoraic base is augmented, but in (27b), where the negative is added, it appears as though *e* remains:

- (27) Negatives with bimoraic bases
 a. e noho! ‘sit!’
 b. kaua e noho! ‘don’t sit!’ (Biggs 1998:72)

The fact that *e* shows up with forms larger than two moras, however, illustrates the point that its presence is not phonologically governed, as in the positive imperatives:

- (28) Negative imperative with trimoraic bases
 a. haere! ‘go!’
 kaua e haere! ‘do not go!’

16. With respect to verbal structures, Harlow also notes that it is the preverbal particles that make a phrase verbal.

- b. *patua!* ‘kill (it)!’
 kaua e patua! ‘don’t kill (it)!’ (Biggs 1998:72)

In these cases, there is a syntactic explanation for the presence of *e*. Hohepa (1969) has claimed that negatives involve two predicates, with the negation as a predicate of the higher clause, and the remnant being a subordinate clause (with its own predication). All such subordinate clauses must be introduced by a tense/aspect marker, yielding, for the second example in (28b), the (unadorned) biclausal structure [*kaua* [*e patua*]]. For these examples, then, the particle must be syntactically conditioned in the negatives, and Bauer (1993:141) notes that *kaua* must always cooccur with *e*. Thus, the augmentation explanation remains unaffected.

4.3 CONTEXTS FOR SMALLEST PHRASES. Returning to the original patterns laid out in section 2, there are unique contexts where the imperative and vocative patterns intersect. For instance, Bauer notes that when the addressee is a bimoraic proper name, the vocative particle *e* precedes it. This is essentially the vocative pattern outlined in 2.2.

- (29) *Haere atu, e Mere!*
 move away VOC Mere
 ‘Go, Mere!’ (Bauer 1993:31)

When the addressee is included after the verb, “it is normally in a separate tone group” (Bauer 1993:31). The comma in the following example indicates the boundary between tone groups. The vocative pattern is also apparent with larger addressee names:

- (30) *E oho, Tamahae!*
 IMP wake Tamahae
 ‘Wake up, Tamahae!’ (Bauer 1993:31)

In this case, it is noteworthy that the addressee is offset from the imperative phrase by a comma (usually indicating a separate phrasing). The implication is that when the addressee is set into its own P-Phrase and does not meet the trimoraic minimum, it is augmented. This pattern will be referenced again in the next section when phrasing and pronominals are discussed. According to Bauer (1993:32), in addition to proper names, the vocative particle may be used before the bimoraic second person singular pronoun *koe* for emphasis, but only when the pronoun is in a separate tone group (for example, *E tū, e koe!* ‘Stand, you!’). Thus, the augmentation appears to be limited to the tone group. The fact that these names/pronominals are offset by a comma, and are in a different tone group, indicates that they are in different phrases. Thus, it is the second phrase in these examples that is undergoing the augmentation. The pronominal *koe* may also be included construction-finally (Bauer 1993:33). In such cases, the pronoun remains preceded by the vocative particle.¹⁷

- (31) *Pūhi-a te manu, e koe!*
 shoot-PASS the.SG bird, VOC 2SG
 ‘Shoot the bird (you)!’ (Bauer 1993:34)

This is parallel to the cases with proper names.

17. Again, nonpronominal subjects also occur in this position (Bauer 1993:33–34).

There is one class of nominals that is worth commenting on at this point. As noted above, while nominals are almost exclusively introduced by a determiner, quantifier, and so on, there is a small class of nouns that remain bare. These are instances of object incorporation, and in addition to the requirement that the noun be interpreted as indefinite, nouns are typically lacking in any particles (though as Bauer 1993 notes, it is possible for incorporated nominals to appear with particles).

- (32) ... i whai [uri] anō tēnei tangata.
 T have descendant again this person
 ‘[The writer does not know whether] this man has any descendants.’
 (Chung and Ladusaw 2004:137; original source Jones and Biggs 1995:39)

In these cases, the incorporated nominal is phrased within the verb phrase; syntactic support for this is the appearance of verbal particles outside of the postverbal nominal. While this kind of phrasing of incorporated nominals is not unusual (in fact, it is the norm), the structure of incorporated nominals will play a role in the phrasing of pronominals, to be discussed in the next section.

The last relevant piece of data to be discussed in this section is the obligatory presence of some verbal particles, such as in the following example, where the phrase nucleus *kī* occurs with the particle *tonu* (Winifred Bauer, pers. comm.):

- (33) {Kī tonu} {te peke}. *Kī te peke.
 full still the bag
 ‘The bag is (still) full.’

These particles can only be omitted if the phrase remains trimoraic or larger, as illustrated in (33). Thus, a phrase minimum is respected through the use of particles, and it reinforces their occurrence with bimoraic bases.

4.4 PHRASING OF PRONOMINALS. The final piece of supporting evidence for the minimal P-Phrase comes from the phrasing of pronominals. Pronominal forms constitute a phrase nucleus; they are interchangeable with other elements that would normally be phrases and/or phrase nuclei. Thus, under the approach advocated here, they should be able to support their own P-Phrase, so long as they meet the requirement that they are phonologically large enough: that is, they are trimoraic or larger, or they are accompanied by supporting particles. This is true for a subset of the pronominals, those that are trimoraic or larger, such as *koutou* ‘2PL’: {*Tēnā*} {*koutou*} ‘Greetings (you PL)’. In contrast, those pronominals that fall below the threshold get phonologically incorporated into the preceding phrase (cf. Bauer 1993:576; Pearce to appear):

- (34) {I haere ia} {ki Kaitāia}.
 T/A go 3SG P Kaitāia
 ‘She went to Kaitāia.’ (Bauer 1993: 562; phrasing by Pearce to appear)
- (35) Tēnā koe, Rāpata.
 DEM 2SG Rāpata
 ‘Good-day, Rāpata.’¹⁸

18. This is translated as ‘Good-day, friend’ by Biggs (1998:3). The comma indicates a phrase break.

With respect to phrasal stress, Harlow (2001:16) notes that a phrase that has a single pronoun will not be treated as a P-Phrase, but will attach like an unstressed particle to a preceding phrase:

- (36) Kua tae mai ia.
 ‘He has arrived’
 Grammatically: [kua tae mai] [ia]
 Phonologically: {kua tae mai ia}

Harlow (2007:136) further notes that pronominals tend to encliticize onto a preceding phrase, forming a single P-Phrase:

- (37) {[e pai ana]_{PRED} [au]_{SUBJ}} [e.pái.a.naau] ‘I am well.’

Identical behavior is exhibited by the pronoun in (38a), due to its bimoraic status, coupled with the fact that it is a subject. On the other hand, the subject pronoun in (38b), which is larger than the trimoraic threshold, is phrased on its own (data and phrasing from Winifred Bauer, pers. comm.).

- (38) a. {Tēnā koe}!
 ‘Greetings!’ (you SG)
 b. {Tēnā} {koutou}!
 ‘Greetings!’ (you PL)

In these cases, the bimoraic pronominal cannot be stranded. Thus, the prosodic phrasing of pronominals lends further support to the idea that P-Phrases have a minimum in Māori. Pronominals in theory should be free-standing words, but for those that fall below the limit, they are adjoined to an already existing phrase, even though the way these elements are phonologically phrased may be inconsistent with syntactic constituency. This is illustrated in (39)–(41), each of which is a minimal pair of sentences, the only difference being in the size of the pronoun (examples without an attributed source are from Winifred Bauer, pers. comm.; glosses are my own, stress is indicated in [39] only).

- (39) a. {Ka 'haere **ia**} {ki 'Hamoa}.
 T/A go 3SG PREP Samoa
 ‘S/he went to Samoa.’
 b. {Ka 'haere} {'**rātou**} {ki 'Hamoa}.
 T/A go 3PL PREP Samoa
 ‘They went to Samoa.’
- (40) a. {Kāore **au**} {i te hiahia} {ki te korero} {ki a koutou}.
 NEG 1SG T/A the want PART the talk PREP DET 2PL
 ‘I don’t want to talk to you (pl.).’
 b. {Kāore} {**māua**} {i te hiahia} {ki te korero} {ki a koutou}.
 NEG 1DU.EXCL T/A the want PART the talk PREP DET 2PL
 ‘We (du. excl.) don’t want to talk to you (pl.).’
- (41) a. {Kua rongo **koe**} {i taua waiata}?
 T/A hear 2SG ACC DET.APH song
 ‘Have you (sg.) heard that song?’

- b. {Kua rongo} {**kōrua**} {i taua waiata}?
 T/A hear 2DU ACC DET.APH song
 ‘Have you (du.) heard that song?’

This type of phonological incorporation of pronominals does not happen only with preceding verbs. In some circumstances, the nucleus of the P-Phrase can be a pronoun, as in (42), indicating that the process is phonological in nature (the generalization and data are from Winifred Bauer, pers. comm.):

- (42) {Mā mātou koe} {e waea atu}.
 POSS.PREP 1PL.EXCL 2SG T/A phone away
 ‘We will phone you.’

Furthermore, phonological incorporation happens even when there are several particles in the periphery of the verb phrase, indicating that it is not due to a pressure to increase the mora-count of the verb phrase:

- (43) {E kite ake ana koe} {i aku hoa}.
 T/A see up T/A 2SG T/A my.PL friend
 ‘You see my friends.’

Incorporated nominals, discussed above, also play a role in this type of phrasing. These nominals are syntactically part of the verb phrase, and their occurrence inside verbal particles supports their phonological phrasing. In addition, when a pronominal subject is employed, it is presumed that if the pronominal is bimoraic, it will be incorporated into the larger verb phrase in the same fashion as above; when it is larger, it will constitute its own P-Phrase:

- (44) {E tuhi-tuhi reta kē ana} {ahau}.
 T/A write-DUP letter CONTR T/A 1SG
 ‘I am writing letters/a letter.’ (lit. ‘I am letter-writing.’) (Bauer 1993: 449)
- (45) {E tuhituhi reta ana ia}.
 T/A write letter T/A 3SG
 ‘She is writing letters/a letter.’ (lit. ‘She is letter-writing.’) (Bauer 1993:86)

Thus, even structures like (44) and (45), which have multiple grammatical functions (subject and object) associated with them, can constitute a single P-Phrase. The data in this section illustrate the point that, while on the whole P-Phrases are largely isomorphic with syntactic phrases, the two are not always identical. It is in the cases where a syntactic phrase (a pronominal subject, for instance) is in danger of violating phrase minimality that it is “rescued” by being incorporated into the preceding structure.

One final comment with respect to pronominal phrasing is in order here. While the personal article *a* is not normally used with pronominal subjects, Biggs (1993:256) notes that “the practice of using the personal article *a* before the pronoun *ia* when it is a subject of the sentence, rare in early texts, is now widespread in colloquial Maori” (Biggs 1998:35), and Bauer (1993:256) makes the observation that the use of the article in this context is variable among speakers. Some dialects (notably Te Rarawa) also exhibit this use of the personal article before the third person pronominal *ia* (Winifred Bauer, pers. comm.), where the presence of the article could be another possible way of resolving the minimal phrase problem without resorting to pronominal incorporation.

For the cases of augmentation discussed in section 2, the minimal phrase is enforced by the ranking of the minimality-demanding constraint BRANCHING PHRASE dominating DEP; however, for the cases of subminimal pronominals, the repair is different. Instead of an augment mora being inserted, there is incorporation of the pronominal into a preceding phrase. The idea here is that since there is already phonological material preceding the subminimal pronominal, there is no need to epenthesize an augment; instead, the strategy is to create a single P-phrase out of two syntactic phrases. This strategy is rooted in economy, as DEP is respected, and BRANCHING PHRASE is satisfied at the expense of another constraint. The constraint in question must be one that requires each syntactic phrase to have a P-phrase correspondent. Selkirk (2011) proposes MATCH PHRASE as such a constraint. In this case, BRANCHING PHRASE must dominate MATCH PHRASE in order to rescue minimal pronominal forms, with the end result being prosodic incorporation into a single phrase. By extension, DEP must also dominate MATCH PHRASE, yielding the ranking BRANCHING PHRASE » DEP » MATCH PHRASE. Thus, while a full formal analysis that includes a factorial typology of these constraints will not be explored here, it suffices to say that a constraint-based approach makes the right predictions insofar as multiple repair strategies (in a single language) are available for potential minimal phrase violations.

5. VARIATION IN POLYNESIAN. A certain amount of light can be shed on the minimal phrase issue in Māori by observing some patterns across Polynesian languages. This includes generalizations regarding imperative and vocative marking in many languages, and also generalizations regarding optionality in Tahitian and Rarotongan, and the phrasing of particles in Ifira-Mele.

One pattern that can be isolated is the consistent lack of any morphological marking for imperatives. For instance, in Tuvaluan, imperatives may consist of bare verbal roots, such as *Vau!* ‘Come [here]!’ (Besnier 2000:34). This pattern also can be found in other Polynesian languages, such as imperatives in West Futunan (Dougherty 1983) and Pukapukan (Salisbury 2002).

In contrast to the pattern of no marking, a pattern of consistent morphological marking, regardless of phonological size, can also be found in Tuvaluan (Besnier 2000). This involves consistent marking of vocatives with the particle *ee*, regardless of whether the verbal base is bimoraic (46a) or larger (46b):

- (46) TUVALUAN: consistent marking
- a. Ee Mili! Vau *mua!*
 VOC Mili come please
 ‘Mili! [Can you] come here, please?’ (Besnier 2000:35)
- b. Ee ttamaa! Koo ttoo te vaiua!
 VOC the+child+SPC INC fall the rain
 ‘Hey, you [child]! It’s starting to rain!’ (Besnier 2000:40)

Between these extreme ends of the continuum, supporting evidence for the minimal P-Phrase comes from two languages from the same branch of Polynesian as Māori (Rarotongan and Tahitian), and an interesting converging pattern can be observed in one of the Outliers (Ifira-Mele).

5.1 RAROTONGAN. Canonical imperatives in Rarotongan exhibit what appears to be free variation between zero- and particle-marked imperatives. The following forms provide a minimal pair, illustrating the optional use of *e* in imperatives with bases larger than two moras:

- (47) RAROTONGAN: imperatives
- a. E ‘aere koe e tāma’iti i a Tara.
 IMP go 2SG IMP startle ACC PERS Tara
 ‘Go and startle Tara.’ (Buse et al. 1996:432)
- b. Ø ‘Aere ki te tai koko.
 IMP go LOC DET sea fast.flowing
 ‘Go to the fast-flowing sea.’ (Short 1951:255)
- c. ‘Aere mai!
 go DIR
 ‘Come here!’ (Kingstone 2008:97)
- d. E ‘akarongo koe i tēia imene mē imene-’ia.
 IMP listen 2SG ACC this song COND sing-PASS
 ‘Listen to this song when it is being sung.’ (Nicholas n.d.)

Forms that are bimoraic are subject to obligatory marking with *e* (Sally Nicholas, pers. comm.). The contrasting forms in (47) are telling, as they help to illustrate a state of affairs that may be indicative of change in progress: where the morphological marking is disappearing in larger forms (similar to Māori), but is still optionally present.

5.2 TAHITIAN. Canonical imperatives in Tahitian are expressed using the “inceptive” aspect. The relevant particle is ‘*a* (Coppenrath and Prevost 1975:201–2; Académie Tahitienne 1986:181–82; Lazard and Peltzer 2000:30–32).

- (48) ‘A rave mai ‘oe i terā ‘āfata!
 ASP hold DIR 2SG PREP that box
 ‘Prends cette caisse-là!’ (= ‘Take this box!’)
 (Académie Tahitienne 1986:182)
- (49) ‘A haere mai i te fare!
 ASP aller DIR PREP ART maison
 ‘Viens à la maison!’ (= ‘Come home!’) (Lazard and Peltzer 2000:53)

Apparently, the particle ‘*a* may be omitted entirely in certain contexts. According to Coppenrath and Prevost (1975:202) and the Académie Tahitienne (1986:182), ‘*a* is very often omitted before verbs of three or more syllables. Lazard and Peltzer (2000:32) note that the particle may be omitted if the core lexeme of the verb phrase is larger than two syllables. This is consistent with the Rarotongan pattern above and, given that the two languages, along with Māori, belong to the same subbranch of Polynesian (Tahitic), the similarities are likely not an accident.¹⁹

5.3 IFIRA-MELE. Finally, supporting evidence for phrasal minimality comes from Ifira-Mele. Early descriptions of the language by Clark (1975) include a rule of initial

19. It is also worth noting that Potsdam (2013) provides similar intonational evidence for the verbal complex in Tahitian to what was presented for Māori.

vowel deletion, whereby short vowels that are in word-initial position and are unstressed are deleted (where stress is antepenultimate). This is apparently a historical rule, but it also has a synchronic residue. The examples in (50) illustrate how (a) the plural definite article /a/, (b) the verbal particle /e(e)/ and (c) the locative particle /i/ resist deletion:

- (50) IFIRA-MELE: vowel alternations
- | | | | | |
|----|---------|--------------|-----------|------------------------|
| a. | á fare | ‘the houses’ | pókasi | ‘the pigs’ |
| | á manu | ‘the birds’ | túluki | ‘the dumplings’ |
| b. | eé goro | ‘sings’ | tánue | ‘spits’ |
| | eé tere | ‘runs’ | karúkaru | ‘scratches’ |
| c. | í mere | ‘at Mele’ | Woraákoru | ‘at Erakor’ |
| | í aro | ‘below’ | kiíraa | ‘there’ (Clark 1975:5) |

According to Clark, “before bivocalic morphemes, these particles regularly receive stress and are therefore preserved from deletion. Otherwise they are unstressed (and in the case of /ee/ subsequently shortened [...]), and thus subject to deletion” (1975:6). Clark (1998:x) also states that “a normal utterance must contain at least three vowels. Many common nouns and verbs in Mele have just two vowels, e.g., fano ‘go’, fare ‘house’. Such ‘short’ words are not full phonological words; Mele speakers will not normally cite them in isolation, but with something prefixed, as ée-fano ‘goes, went’, té-fare ‘the house’.” Biggs (1975:8) also discusses how this pattern has led to differences with other linguists in the analysis of word-forms; he notes that Samuel Elbert grouped particles together with bases in lexical entries (as opposed to separating them morphologically, as do Biggs and Clark).

The patterns reported for Ifira-Mele fit in nicely with the overall picture developed here. While Biggs (1975) and Clark (1998) ultimately analyze the augmentation pattern as one designed to fulfill the requirement of achieving antepenultimate stress in bimoraic contexts, this is not fully inconsistent with the augmentation account presented here. While the augmentation is driven by stress assignment in Ifira-Mele, it is relevant because even though the minimality effects are thought to satisfy a minimal stress-foot, the effects also conspire to arrive at the exact same output structure as in the Māori case.

6. DISCUSSION. While the previous discussion has been dedicated to building the case for a minimal P-Phrase in Māori, it is worth noting some problematic issues. One has to do with the restructuring of the phonology of younger speakers of Māori, and another with length alternations in particles that do not yield trimoraic structures. These will be discussed in turn.

6.1 CHANGES IN YOUNGER GENERATIONS. In the interest of transparency, it is worth noting that several of the generalizations outlined above are no longer valid for younger generations of speakers of Māori. Some length contrasts are decaying, such that the trimoraic phrase is no longer being strictly enforced in certain contexts. In response to questions, single-word answers such as *āe* and *kāo* are often phonetically shortened to [ae] and [kao], and answers that include isolated tense/aspect markers are now becoming licit (data and generalization from Winifred Bauer, pers. comm.). As an example, a question with the T/A marker *kua* can be answered simply with “*kua*.”

- (51) A: Kua oti tō mahi?
 TA be.finished your work
 ‘Have you finished your work?’
 B: Kua.
 TA
 ‘I have.’

Innovative forms like this are likely due to structural pressures from English, whereby English syntax/phonology permits responses that are both bimoraic, and not marked for focus by a morpheme (that is, by *ko*). What is characteristically un-English-like about the structure is the lack of an expressed subject; however, since Māori allows for pro-drop of subjects, this pattern falls out naturally from that fact.

Another example involves prepositions. Preposition stranding (under noun phrase movement) is not tolerated in Māori (Bauer 1993). In a related fashion, it is not possible to omit the complement of a preposition in instances where there is identity in coordinated clauses (even though adnominal phrases can be omitted in these same contexts) (Bauer 1993:139):

- (52) *I nā raro ia ki me i te mahi.
 T/A ACT.GEN underneath 3SG to with from the work
 Intended: ‘He walks to and from work.’ (Bauer 1993:139)

This is also evident in echo questions, where the relevant wh-word *hea* ‘where’ must appear preceded by a preposition:

- (53) E haere ana au ki te teihana.
 T/A move T/A 1SG to the station
 ‘I’m going to the station.’
Ki hea?
 to where
 ‘Where?’ (Bauer 1993:27)

However, as Reedy (2000) has noted, this has changed for younger generations of speakers. It is illustrated by the pair of sentences in (54), where (54a) is the “traditional” form, with the preposition “pied-piped” along with the wh-phrase to sentence-initial position, and (54b), typical of younger speakers, is with the preposition stranded *in situ*.

- (54) a. **Mō** te aha tēnei? Traditional Speakers
 for the what this
 ‘What’s this for?’
 b. Te aha tēnei **mō**? Younger Speakers
 the what this for
 ‘What’s this for?’ (Reedy 2000:164)

This type of preposition stranding is an innovation in Māori, and is likely due to contact with English, as noted by Reedy (cf. the English translations for both versions of [54], where the preposition is stranded). This is a difference between (traditional) Māori and English: while they both exhibit a bimoraic word minimum, the phrasal minimum in Māori prohibits what is freely acceptable in the English translation.

6.2 PROBLEMATIC LENGTH ALTERNATIONS. There is also one area for further research that is unquestionably related to the prosodic nature of augmentation in minimality contexts, but which is arguably, at heart, a different phenomenon. This is the lengthening of certain particles. Biggs (1998) (cf. Bauer 1993:535) discusses several minor morphemes that fluctuate in length. While there are several particles that exhibit this behavior, special attention has been given in the literature to the T/A particle *ka* (see especially Harlow et al. 2011), so the discussion here will focus on this particular morpheme (especially since the other particles likely exhibit similar behaviors).

Biggs (1998:19) notes that the surface form of *ka* is sensitive to the size of the rest of the phrase it appears in. For phrases of only two moras, *ka* will surface with a long vowel; for phrases that are larger, it will surface as short. What is striking about Biggs's observation is the context that triggers the alternation: the phrase. This is exactly the same context that triggers augmentation with *e*, and also pronominal incorporation. The examples in (55) illustrate.

(55) [ka:] noho 'sits, lives' vs. [ka] maranga 'gets up' (Harlow et al. 2011:53)

The problem presented by this length alternation is the end result: it seemingly creates a four-mora minimum phrase, which is different from the by-now-familiar trimoraic minimum discussed throughout this paper.

Harlow et al. (2011) make the interesting comment that the *ka*-alternation is an old one; in fact, they state that it can be historically reconstructed back to Tahitic. It could be the case, then—since some particles alternate in length, and others do not, although the augmentation is consistent—that the *ka*-alternation and augmentation are separate rules that have become fossilized. In other words, augmentation may be the result of bringing a phrase up to the minimal threshold by inserting something; on the other hand, the *ka*-rule is taking material that is already present (that is, a particle) and lengthening it for what appear to be (at present) unmotivated reasons. Finally, while the alternation is problematic, it is worth pointing out that it may be no accident that the augmentation pattern also receives supporting evidence from the languages in the Tahitic subbranch. The extent to which these patterns are linked, or are separate, deserves further investigation.

In an opposite fashion, there are other particles that seem to exhibit shortening. Biggs (1998:43) discusses the pronunciation of the possessive particles *a* and *o*, where these are short before short syllables, but long before syllables with more than one mora. Biggs (1998:61) also discusses the possessive prepositions *ma*, *na*, *mo*, and *no*, where these particles exhibit an identical behavior. Furthermore, Schütz (1985:17) notes that “grammatical markers consisting of a long syllable have the potential of shortening before an unaccented syllable.” Since the conditions on these shortenings are dependent on the following syllable, this is a strictly local effect, and not a phrasal effect; that is, the phrase is not the triggering context for shortening—the following syllable is. This context is different from the *ka*-rule, and also from the cases of phrasal minimality discussed above. It is also possible that this alternation is dependent on stress,²⁰ very much along the lines suggested by Schütz. Thus, these particles are worth mentioning, because they share characteristics with the augment, though they ultimately have semantic content, and in some cases are conditioned only by the adjacent following syllable.

One possible historical scenario includes a requirement on Prosodic Words such that they branch into feet, with no stray, unfooted syllables. This could account for the behavior of the lengthening particles, as well as that of the shortening particles, though it is contingent on the augment being historically long, and all particles fluctuating in length. The former is a real possibility, as this would be consistent with the Tuvaluan facts, where the imperative marking is long. An avenue for future research is to explore whether a unified analysis of all of the particles and alternations is possible, both synchronically, and diachronically.

7. CONCLUSION. This paper has presented a phonological augmentation effect in Māori. It was shown that the minimality effect in the language is based on the P-Phrase, and results in a trimoraic structure that contrasts with the minimality effect governing lexical words, which yields bimoraic structures. Supporting evidence for this pattern comes in the forms available for the smallest phrases, as well as a process of pronominal incorporation. Corroborating evidence was also surveyed across various members of the Polynesian family. This research contributes toward a larger aim of exploring minimality effects in elements larger than the word. The resulting picture puts Polynesian into a larger typology of minimality effects, and defines a larger research program for exploring the historical processes that have shaped the prosodic phenomena in the present-day languages.

The approach adopted here derived the minimal phrase in an indirect fashion based on branching: rather than stipulate a trimoraic template, the conditions instead demand that a minimal phrase must branch at a particular level in the hierarchy (that is, Prosodic Word or Foot). Since the minimal lexical word is bimoraic, the result is a trimoraic phrasal minimum. In avoiding resorting to a trimoraic template to generate a P-Phrase, the approach is consistent with Downing's (2006) "canonical forms" approach, whereby the canonical forms of morphemes (minimal bimoraic foot + minimal monomoraic syllable) combine to yield the trimoraic structure that is the phrasal minimum. In other words, the minimal phrase does not fall out of stipulative constraints on size; rather, it is the cumulative sum of the individual parts, whereby P-phrases must branch at a given level, Words must branch at a given level, and so on (cf. also work in Generalized Template Theory by McCarthy and Prince 1995).

The state of affairs whereby phonological phrasing and syntactic phrasing are isomorphic is the default case. However, it is in certain restricted pockets of the grammar where the syntax allows for a smaller phrase than does the minimality constraint. It is in these contexts where the phonological preferences step in to provide a solution to the subminimal phrase. In the case of imperatives, the solution is to insert a semantically inert augment *e*; in the case of phrases with only bimoraic pronouns, the solution is to incorporate the pronoun into the preceding phrase. Thus, phonological pressures exerted by BRANCHING PHRASE can trump the constraints enforcing the default phrasing of the language (MATCH PHRASE).

20. In a similar but opposite manner, (Biggs 1998:35) discusses phrases with the personal article *a* preceding the pronouns *ia* '3SG' and *koe* '2SG'. He notes that the personal article lengthens and also takes phrasal stress in these cases: for example, *a ia* ['a:ia]. It is likely that these pronominals, which undergo phonological incorporation, also resist stress (both of which are hallmarks of clitics). It is in these contexts, then, that it can be speculated that a particle like *a* lengthens in order to bear stress.

With respect to the specifics relating to Māori, the augmentation analysis adopted above implies the existence of multiple homophonous [e] elements: one is prosodic and surfaces in contexts where phrasal minimality is at stake, and another is syntactic and marks a dedicated tense/aspect distinction. The details of the argument also illustrate the complexities involved in uncovering the prosodic nature of the augment. It was noted that the syntax “conspires” to meet the phrase minimum; however, it was the existence of rare constructions that allow for bare bases that provided the evidence for augmentation. Without this crucial evidence, the augment would appear to be just another morphosyntactic particle.

REFERENCES

- Académie Tahitienne. 1986. *Grammaire de la langue tahitienne*. Papeete: Fare Vana'a.
- Barton, Bill. 2008. *The language of mathematics: Telling mathematical tales*. Boston, MA: Springer.
- Bauer, Winifred. 1981. Hae.re vs. ha.e.re: A note. *Te Reo* 24:31–36.
- . 1993. *Maori*. London: Routledge.
- . 1997. *The Reed reference grammar of Māori*. Auckland: Reed.
- Best, Elsdon. 1906. Maori numeration: Some account of the single, binary, and semi-vigesimal systems of numeration formerly employed by the Maori. *Transactions and Proceedings of the Royal Society of New Zealand* 39:150–80.
- Biggs, Bruce. 1960. Morphology-syntax in a Polynesian language. *Journal of the Polynesian Society* 69:376–79.
- . 1961. The structure of New Zealand Māori. *Anthropological Linguistics* 3:1–54.
- . 1975. *A Mele-Fila vocabulary*. Auckland: Linguistic Society of New Zealand.
- . 1980. Traditional Maori song texts and the “rule of eight.” *Paanui* 3:48–50.
- . 1998. *Let's learn Māori*. Auckland: University of Auckland Press.
- Blevins, Juliette. 1994. The bimoraic foot in Rotuman phonology and morphology. *Oceanic Linguistics* 33:491–516.
- Blevins, Juliette, and Sheldon P. Harrison. 1999. Trimoraic feet in Gilbertese. *Oceanic Linguistics* 38:203–30.
- Brown, Jason, and Francis McWhannell. To appear. Imperatives and other directives in the Polynesian languages. In *Imperatives and other directive strategies*, ed. by Simone Heinold and Daniel van Olmen. Amsterdam: John Benjamins.
- Buse, Jasper E., Raututi Taringa, Bruce Biggs, and Rangī Moeka'a. 1996. *Cook Islands Māori dictionary with English-Cook Island Māori finderlist*. Canberra: Research School of Pacific and Asian Studies, Australian National University.
- Chung, Sandra, and Bill Ladusaw. 2004. *Restriction and saturation*. Cambridge, MA: MIT Press.
- Clark, Ross. 1975. *Mele notes*. Working papers in anthropology, archaeology, linguistics, Maori studies. Department of Anthropology, University of Auckland.
- . 1998. *A dictionary of the Mele language*. Canberra: Pacific Linguistics.
- Clemens, Lauren. 2014. Prosodic noun incorporation and verb-initial syntax. PhD diss., Harvard University.
- Condoravdi, Cleo. 1990. Sandhi rules of Greek and prosodic theory. In *The phonology-syntax connection*, ed. by Sharon Inkelas and Draga Zec, 63–84. Chicago: The University of Chicago Press.
- Coppenrath, Hubert, and Paul Prévost. 1975. *Grammaire approfondie de la langue tahitienne (ancienne et moderne)*. Papeete: Librairie Pureora.

- de Lacy, Paul. 2003. Constraint universality and prosodic phrasing in Māori. In *Papers in Optimality II*, ed. by Angela Carpenter, Andries Coetzee, and Paul de Lacy, 59–79. Amherst: GLSA.
- . 2004. Maximal words and the Maori passive. In *Optimality theory: A reader*, ed. by John J. McCarthy, 495–512. Malden, MA: Blackwell Publishing.
- Dougherty, Janet W. D. 1983. *West Futuna-Aniwa: An introduction to a Polynesian Outlier language*. Berkeley: University of California Press.
- Downing, Laura J. 2006. *Canonical forms in prosodic morphology*. Oxford: Oxford University Press.
- Ghini, Mirco. 1993. ϕ -formation in Italian: A new proposal. *Toronto Working Papers in Linguistics* 12:41–77.
- Hammond, Michael. 1997. Vowel quantity and syllabification in English. *Language* 73:1–17.
- . 1999. *The phonology of English*. Cambridge: Cambridge University Press.
- Harlow, Ray. 2001. *A Māori reference grammar*. Auckland: Pearson Education New Zealand Limited.
- . 2007. *Māori: A linguistic introduction*. Cambridge: Cambridge University Press.
- Harlow, Ray, Winifred Bauer, Margaret Maclagan, Catherine Watson, Peter Keegan, and Jeanette King. 2011. Interrupted transmission and rule loss in Māori: The case of *ka*. *Oceanic Linguistics* 50:50–64.
- Hayes, Bruce. 1989. The prosodic hierarchy in meter. In *Rhythm and meter*, ed. by Paul Kiparsky and Gilbert Youmans, 201–60. Orlando, FL: Academic Press.
- . 1995. *Metrical stress theory: Principles and case studies*. Chicago: University of Chicago Press.
- Hohepa, Patrick W. 1967. *A profile generative grammar of Māori*. Indiana University Publications in Anthropology and Linguistics. *International Journal of American Linguistics*, Memoir 20.
- . 1969. *Not* in English and *kore* and *eehara* in Maori. *Te Reo* 12:1–34.
- Ito, Junko, and Armin Mester. 2003. Weak layering and word binarity. In *A new century of phonology and phonological theory*, ed. by Takeru Honma, Masao Okazaki, Toshiyuki Tabata, and Shin-ichi Tanaka, 26–65. Tokyo: Kaitakusha.
- Jones, Pei Te Hurinui, and Bruce Biggs. 1995. *Nga iwi a Tainui: The traditional history of the Tainui people*. Auckland: Auckland University Press.
- Kingstone, Taria. 2008. *Te Pepe Kuki Airani: A beginners guide to Cook Islands Maori*. Auckland: The Faculty of Arts, The University of Auckland.
- Lazard, Gilbert, and Louise Peltzer. 1991. Predicates in Tahitian. *Oceanic Linguistics* 30:1–31.
- . 2000. *Structure de la langue tahitienne*. Paris: Peeters Press.
- McCarthy, John J., and Alan S. Prince. 1986. Prosodic morphology. Ms, University of Massachusetts and Brandeis University.
- . 1990. Foot and word in Prosodic Morphology: The Arabic broken plurals. *Natural Language and Linguistic Theory* 8:209–83.
- . 1993. *Prosodic morphology: Constraint interaction and satisfaction*. Report no. RuCCS-TR-3. New Brunswick, NJ: Rutgers University Center for Cognitive Science.
- . 1995. Faithfulness and reduplicative identity. In *Papers in Optimality Theory*, ed. by Jill Beckman, Laura Walsh-Dickey, and Suzanne Urbanczyk, 249–384. Amherst, MA: GLSA.
- McLean, Mervyn. 1982. The “rule of eight” and text/music relationships in traditional Maori *waiata*. *Anthropological Linguistics* 24:280–300.

- Meyerhoff, Miriam, and Bill Reynolds. 1996. On reduplication and its effects on the base in Maori. In *DAM phonology: HIL Phonology Papers II*, ed. by Marina Nespors and Norval Smith, 143–64. The Hague: Holland Academic Graphics.
- Mutu, Margaret. 1989. An overview of theoretical orientations to Polynesian syntax. In *VICAL 1 Oceanic languages: Papers from the Fifth International Conference on Austronesian Linguistics*, ed. by Ray Harlow and Robin Hooper, 399–412. Auckland: Linguistic Society of New Zealand.
- Nespor, Marina, and Irene Vogel. 1986. *Prosodic phonology*. Dordrecht: Foris.
- Nicholas, Sally. n.d. Ko te karāma o te Reo Māori o te Pae Tonga o Te Kuki Airani: An aspect of the grammar of Southern Cook Islands Māori. PhD thesis in progress, University of Auckland.
- Pearce, Elizabeth. To appear. Deficiency in Māori phrases. *Te Reo* 56.
- Potsdam, Eric. 2013. On the derivation of VSO order in Tahitian. Paper presented at the Ninth International Conference on Oceanic Linguistics, University of Newcastle, February 5.
- Reedy, Tamati. 2000. Te Reo Maori: The Past Twenty Years and Looking Forward. *Oceanic Linguistics* 39:157–68.
- Salisbury, Mary. 2002. A grammar of Pukapukan. PhD thesis, University of Auckland.
- Schütz, Albert J. 1985. Accent and accent units in Māori: The evidence from English borrowings. *Journal of the Polynesian Society* 94:5–26.
- Selkirk, Elisabeth. 1978. On prosodic structure and its relation to syntactic structure. In *Nordic prosody II*, ed. by Thorsten Fretheim, 111–40. Trondheim: TAPIR.
- . 1980a. Prosodic domains in phonology: Sanskrit revisited. In *Juncture*, ed. by Mark Aronoff and Mary-Louise Kean, 107–29. Saratoga, CA: Anma Libri.
- . 1980b. The role of prosodic categories in English word stress. *Linguistic Inquiry* 11:563–605.
- . 1981. On the nature of phonological representation. In *The cognitive representation of speech*, ed. by Terry Meyers, John Laver, and John Anderson, 379–88. Amsterdam: North Holland.
- . 1995. The prosodic structure of function words. In *Papers in Optimality Theory*, ed. by Jill Beckman, Laura Walsh-Dickey, and Suzanne Urbanczyk, 439–69. Amherst: GLSA.
- . 2000. The interaction of constraints on prosodic phrasing. In *Prosody: Theory and experiment*, ed. by Merle Horne, 231–61. Dordrecht: Kluwer.
- . 2011. The syntax-phonology interface. In *The handbook of phonological theory*, 2nd ed., ed. by John A. Goldsmith, Jason Riggall, and Alan C. L. Yu, 435–83. Oxford: Wiley-Blackwell.
- Short, Apenera. 1951. Native proverbs and figurative expressions of the Cook Islands. *The Journal of the Polynesian Society* 60:255–59.
- Tryon, Darrell T. 1970. *Conversational Tahitian*. Berkeley: University of California Press.
- Waite, Jeffrey. 1990. Another look at the actor-emphatic. *Te Reo* 32:61–94.
- Williams, Herbert W. 1975. *A dictionary of the Maori language*. 7th ed. (reprinted). Wellington: A. R. Shearer.