

Cliticization to NP and Lexical Phonology
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1. Introduction

The term *clitic* is usually applied to morphemes whose distribution is syntactic in nature but which, rather than being treated as phonological words themselves, attach to a neighboring word. They are thus syntactic words that are, from a phonological point of view, parts of other words. The sense in which clitics become part of other words is generally left rather vague, and in many cases it appears that the only property that clitics have that distinguishes them from ordinary words is their lack of stress. More generally, the relevant notion of "phonological word" is usually one equivalent to "minimal prosodic phrase". The existence of clitics of this type is not particularly problematic.

Within the theory of Lexical Phonology (Kiparsky 1981, Mohanan 1981), and less explicitly, within other lexicalist theories, there is another sense to the notion in which a morpheme may belong to another word, namely that it might give evidence of belonging not merely to a phonological word but to a lexical word, that is, that it might give evidence of being attached in the lexicon by word-formation rules. Were morphemes of this type to be found it would be necessary either to abandon the division between lexical and post-lexical processes or to modify the relationship between morphology and syntax in such a way as to provide a means for the lexically attached morpheme to have its effect in the syntax.

In the present paper I propose to show that a clitic with exactly these properties occurs in Tongan. Like the English genitive /z/, this Tongan morpheme appears at the extreme right of a Noun Phrase. But perhaps unlike the English genitive, whose status is unclear, there is strong evidence that this Tongan morpheme is lexically attached. In the following sections I will demonstrate the phrasal distribution of this morpheme, argue that it is lexically attached, and finally consider how this apparent paradox may be resolved.¹

2. The Definitive Accent

The morpheme in question is a definiteness marker referred to as the definitive accent. The precise semantic and discourse function of the definitive accent is difficult to describe. Fortunately, we need not here be concerned with the exact semantics of this morpheme. At first glance it is not quite the same as the English definite article, for Tongan possesses, in addition to the definitive accent, a distinction between definite and indefinite articles. However, this difference corresponds more closely to one between specific and generic indefinites, and to translate an English definite article it is usually necessary to use not only the Tongan definite article but also the definitive accent. The definite articles may thus be used with or without the definitive accent, but only in certain special cases may the definitive accent co-occur with an indefinite article.²

The definitive accent is so-called because definitive marking consists of a shift of stress from its normal position. Normally, the main stress in Tongan falls on the penultimate mora,

¹ Since beginning work on this topic I have had the good fortune to work with a Tongan informant. However, virtually all of the data given here may be found in Churchward's excellent grammar and dictionary (Churchward 1953, 1959), the reading of which motivated this paper.

² See Churchward (1953), especially section 33, for a detailed discussion.

which we state in (1).

(1) Stress Placement

$$V \Rightarrow [+STRESS]/_ C_0 V\#$$

If the vowel of the last syllable is long, as in (2), the stress will then fall on the ultima.³ But if the last syllable is short, as in (3), the stress will fall on the penult. As the examples in the second column in (3) show, a number of morphological processes precede stress placement, so that it is the penultimate mora of the word rather than the penultimate mora of the stem that bears the main stress.

(2) Final Stress on Words with Long Ultima

hangé: "to be like"
kotokó: "to cackle"
kumá: "rat"

(3) Basic Stress and Stress Shift Induced by Suffixation

fále "house" faléni "this house"
fetú?u "star" fetu?úa "starry"
móhe "to sleep" mohénga "bed"

In contrast, as illustrated by examples (5) through (12) in the following section, in the definitive form the primary stress invariably falls on the final mora of the word. Thus, the definitive form is characterized by a shift of stress from its normal penultimate position onto the ultima.

3. The Phrasal Distribution of the Definitive Accent

The distribution of the definitive accent in Tongan is similar to that of the English genitive /z/ in that it appears on the rightmost word in the Noun Phrase whether or not that be the head. A typical English example is given in (4).

(4) This is [the man I saw yesterday at three o'clock]'s hat.

In Tongan the Noun Phrase has the basic expansion **NP** => **Article Head Modifiers** so that in general the rightmost word is not the head of the NP. In example (5) it happens that the rightmost word in the NP, the noun *fakataha*, which bears the definitive accent,⁴ happens to be the head, but as example (6) shows, when the adjective *lahi* is added and occupies the final position in the NP, it is the modifier and not the head noun that bears the definitive accent. But when the NP is followed by a word that does not belong to the NP, for example the adverb *aneafi* in example (7), the definitive accent remains on the last word in the NP.

³ Examples are here transcribed in accordance with Tongan orthography, which is approximately phonemic, with the exception that long vowels are marked with a colon rather than a macron. Adjacent identical short vowels are heterosyllabic. Secondary stress is not marked, and primary stress is marked only where relevant.

⁴ In this and subsequent examples definitive forms are printed in boldface.

- (5) na?a ke ?alu ki he **fakatahá**.
Q you go to the meeting
Did you go to the meeting?
- (6) na?a ke ?alu ki he fakataha **lahĩ**.
Q you go to the meeting big
Did you go to the big meeting?
- (7) na?a ke ?alu ki he fakataha **lahĩ** aneafi .
Q you go to the meeting big yesterday
Did you go to the big meeting yesterday?

Examples (8) through (10) illustrate the same point. In (8) the NP consists only of the article and the head noun, and the head noun, being final, bears the definitive accent. In (9) the PP *?a Feleti* follows the head within the NP and the definitive accent moves off the head onto *Feleti*. In (10) the PP has been extended by conjunction and the definitive accent moves onto the final conjunct.

- (8) kuo maumau ?a e **sa:lioté**
past broke absolutive the cart
The cart is broken.
- (9) kuo maumau ?a e sa:liote ?a **Feletĩ**
past broke absolutive the cart genitive Fred
Fred's cart is broken.
- (10) kuo maumau ?a e sa:liote ?a Feleti mo **Sioné**
past broke absolutive the cart genitive Fred and John
Fred and John's cart is broken.

The word that bears the definitive accent may belong to a relative clause. In (11) the verb of the relative clause is the rightmost word in the NP and so bears the definitive accent. In (12) the rightmost word is the locative resumptive pronoun *ai* in the relative clause, and it bears the definitive accent.

- (11) e me?a kuo **kokó**.
the thing past happen
The thing which has happened.
- (12) te u ?alu ki he fale kuo nau fakataha **aĩ**.
fut I go to the house past they assemble in-it
I will go to the house in which they have assembled.

In sum, the definitive accent falls on the rightmost word in the definite NP, regardless of what that word may be and with no regard to whether that word be the head. It may be a member of any category: a noun, a pronoun, an adjective, a verb, or an adverb, and it may even belong to an embedded clause. This distribution is strongly suggestive of clitic status for the definitive accent since it seems to be a property not of any particular word but of the NP as

a whole, one that happens to be realized on the rightmost word.

4. The Lexical Nature of Definitive Accent Placement

The principle of Lexical Phonology to which I shall have recourse is that only lexical rules may have access to lexical information. This means, more precisely, that post-lexical rules may neither have access to the internal structure of words nor know the identity of their component morphemes. Thus, if a rule is restricted to a particular word-internal domain it must be lexical. Similarly, if the rule has exceptions, or is a minor rule, it must be a lexical rule.⁵

4.1. The Representation of the Definitive Morpheme

If the definitive morpheme is to be treated as a clitic, the problem that immediately presents itself is how to represent it. Within the framework of Lexical Phonology a true clitic cannot serve as the trigger of a morphological process since this would require recourse on the part of a post-lexical rule to lexical information, namely the identity of the triggering morpheme. Instead, the clitic must be a formative, that is to say, a chunk of phonological substance.⁶ Since the definitive morpheme is realized as a stress shift onto the ultima it must, if it is to be treated as a clitic, consist of an empty mora or syllable whose presence will render the actual ultima the penult for the purpose of stress assignment.⁷ This is not entirely inconceivable within current phonological theory, but within those theories that allow empty syllables they are permitted only as templates for morphological processes that fill them. In the present case, however, the empty syllable would not play this role, and indeed it is unclear how to

⁵ This principle is not entirely uncontroversial, and indeed, in certain works that come under the rubric of Lexical Phonology, is ignored. The authors of such works appear to take the term *Lexical Phonology* to refer to any theory in which there is a component in which phonological rules apply cyclically in tandem with rules of word-formation, followed by a component containing the post-cyclic rules. On this view, the distinction between the lexical and post-lexical rules is simply one between cyclic and post-cyclic rules, with no other properties attributed to the two components, and no sense in which the output of the lexical phonology constitutes a level of representation. In contrast, the theory of Lexical Phonology as developed by Kiparsky (1981) and Mohanan (1981) attributes quite specific and distinct properties to the two components, and takes the boundary between the two to be a level of representation. This is certainly the more interesting view, and it is one for which considerable support has been adduced. This is not to say that there are no problematic cases known for these the stronger claims regarding the lexical/post-lexical division. However, the evidence in favor of these claims is strong, and the number of putative counterexamples small. Moreover, there is reason to believe that it will be possible to reanalyze these counterexamples. Even at the most basic factual level phrasal phonology is in general poorly understood, and even in the case of word-bounded segmental phonology reanalyses are often found when the previous analysis is carefully considered. In addition, the criteria for determining that a given phenomenon is post-lexical are themselves not entirely clear; the present paper provides a case in point. Lest I be accused of unfounded optimism in this regard, let me briefly describe one concrete example. In (Poser 1984) I described a rule of Japanese that deletes the pitch accent from the final mora of nouns when they are immediately followed by the genitive/copula *no*. This rule was argued to be post-lexical on the grounds that it is conditioned by actual intonational phrasing. However, the rule has lexical exceptions, both positive and negative. It therefore appears to be a case of a post-lexical rule with lexical exceptions, and thus to counterexample one of the claims of Lexical Phonology. However, M. Enomoto (Enomoto 1984) has pointed out that this situation could be the result of the combination of (a) a lexical rule of accent deletion, and (b) a post-lexical rule that assigns accents in an environment that includes the one in which accents are deleted by the first rule. It would then be its interaction with the post-lexical rule that gives the lexical rule the appearance of being subject to a post-lexical condition. While further research is necessary to determine whether Enomoto's proposal is the correct solution, it is sufficiently plausible that I believe that my apparent counterexample will in fact prove not to be one.

⁶ I do not say "string of segments" since phonological representations are no longer held to consist of strings of segments but rather to be more complex multi-dimensional structures with constituent structure.

⁷ I mention the mora because, as I have stated the stress rule, normal stress falls on the penultimate mora. However, I suggest below that at the point at which the stress rule applies every mora is a syllable.

avoid filling it in. In sum, treating the definite morpheme as a clitic requires the adoption of a dubious, though possibly tenable, phonological representation.⁸

4.2. Definite Accent Placement and Syllable Fusion

There is another stronger reason to believe that the definite morpheme is lexically attached. I will show here that Definite Accent Placement must precede a rule of Tongan that I will call Syllable Fusion, and that Syllable Fusion is lexical. *A fortiori* Definite Accent Placement must also be lexical.

When two vowels come to be adjacent in Tongan, whether they will form a single syllable or belong to two different syllables is predictable. If the two vowels are identical, or if the sequence is one of the set: {*ei, ai, ae, ao, au, oi, oe, ou*}, they may be put into the same syllable, yielding a long vowel or diphthong, subject to two conditions to be discussed. In all other cases the two vowels will belong to different syllables. Assuming that the initial stage of syllabification in Tongan produces only light syllables we can describe this process as Syllable Fusion.⁹ An alternative would be to view this alternation as one that splits underlying long vowels and diphthongs into two syllables, but there are two reasons to prefer the Syllable Fusion account. The first is that there are cases in which a long vowel arises from the conjunction of heteromorphemic short vowels. This is illustrated by the last two examples in (13). Here the suffix *-a* "abounding in", shown by the first three examples to have this form, combines with the final *a* of the stem to form a long vowel. I will return to the other reason shortly.

(13) Synthetic Long Vowels

é fu	"dust"	efú a	"dusty"
ní u	"coconut"	niú a	"abounding in coconut trees"
lá ngo	"fly"	langó a	"infested with flies"
fuofú a	"pimple"	fuofuá :	"pimpily"
í ka	"fish"	iká :	"abounding in fish"

4.2.1. Definite Accent Placement Precedes Syllable Fusion

One of the conditions on Syllable Fusion is that the primary stress must not fall on the second of the two vowels. This is illustrated by the examples in (14). In the first three examples the addition of a suffix shifts stress onto the second of a pair of like vowels, preventing them from being fused into a long vowel. The second and third examples show that when still another suffix is added, shifting the primary stress off the second member of the pair, they again fuse into a long vowel. The same effect is seen in the pronunciation of the name *Mark*, which is [maá ka]. The long vowel (from a British, r-less dialect) is analyzed as consisting underlyingly of two short /a/s, and since the stress falls on the second of these they cannot be fused. The last example in (14) illustrates the opposite effect. In the unsuffixed form the two

⁸ Feldman (1978) cites Clark (1974), which I have not seen, to the effect that the definite accent probably derives historically from a suffix *-e. If this is correct, the stress shift is indeed due historically to the presence of another syllable to the right of the current ultima, but this sheds no light on the synchronic analysis of the shift.

⁹ The proposal that the rule is one of fusion rather than splitting is due to Feldman (1978).

adjacent /a/s are rearticulated because the second bears primary stress. When the suffix *ni* is added, shifting the stress off this /a/ onto the following syllable /ma/, the two /a/s fuse.

(14) Change in Syllabification under Stress Shift Due to Suffixation

po:	"night"	poó ni	"this night"		
hu:	"go in"	huú fi	"open officially"	hu:fi a	"sneak in"
fakahá :	"to show"	fakahaá ?i	"to show completely"	fakaha:ʔi a	"id. polite"
maá ma	"world"	ma:maá ni	"of this world"		

The fact that stress placement conditions Syllable Fusion is the second reason for assuming that the process is indeed one of fusion rather than splitting. The two vocalic morae must be distinct constituents at the point at which stress placement applies so that stress can be assigned to one and not the other. This is consistent with fusion, but not with splitting.

The crucial aspect of this condition on Syllable Fusion is that it is not only normal primary stress that governs syllabification; Definitive Accent Placement also affects syllabification. This is illustrated by the examples in (15). In the first two cases a word with a long vowel in the non-definitive form has a disyllabic sequence in the definitive form due to the shift of primary stress onto the second mora of the sequence. In the last example a sequence of like vowels that is disyllabic in the non-definitive form fuses in the definitive form due to the shift of primary stress off the second mora onto the following syllable.

(15) Change in Syllabification due to Definitive Accent

poó	definitive of	pó :	"night"
huú	definitive of	hú :	"enter"
ma:maá	definitive of	maá ma	"lamp, light"

From this we draw the conclusion that both ordinary Stress Placement and Definitive Accent Placement precede Syllable Fusion.¹⁰

4.2.2. Syllable Fusion is Lexical

I will argue that Syllable Fusion is lexical for two different reasons. First, Syllable Fusion is restricted to word-internal domains. It applies to morpheme-internal vowel sequences and to some heteromorphemic sequences, as we have seen, but it fails to apply to other

¹⁰ In the question period L. Hyman raised the question of why the first stage should be called *syllabification* and the second stage *syllable fusion*, suggesting instead that the first stage might be the creation of moras (the *W(eight) U(nit)s* of Hyman (1985)) and the second stage syllabification proper. This is not impossible, though my own belief is that in general what Hyman treats as WU Formation is best treated as an initial syllabification. One reason for adopting this position in the present case is that the "initial units", whatever we may call them, are assigned stress, and it appears to be true that the stress-bearing unit is universally the syllable, never the mora, as Kiparsky (1973) has observed. Whatever the case may be, note that whether the rule in question is "Syllable Fusion" or "Syllabification" the argument given here is unaffected, since what is crucial is that this rule be governed by the location of stress and therefore subsequent to Stress Placement, including the special case of Definitive Accent Placement.

heteromorphemic sequences. As the examples in (16) show, Syllable Fusion fails to apply between the two halves of a reduplication.

(16) Failure of Syllable Fusion in Reduplication

ongoongó a	"famous"	< ongoó ngo	"news"
angaangapiko	"somewhat crooked"	< piko	"crooked"

Similarly, as illustrated in (17), the final /a/ of the prefix *faka* does not fuse with the initial vowel of the stem to which it attaches.

(17) Failure of Syllable Fusion in Prefixation with *faka*

fakaafá :	"bring a hurricane upon"	< afá :	"hurricane"
fakaavá ?i	"to open completely"	<faka + ava + ?i	

The failure of Syllable Fusion to apply to all word-internal vowel sequences meeting its structural description means that it cannot be post-lexical, for a post-lexical rule cannot make use of this sort of information about the internal structure of the word.

The second reason that Syllable Fusion must be lexical is that it precedes a minor rule, that is to say, a rule that applies only to a small number of lexically idiosyncratic morphemes. As we have seen, most long vowels alternate with pairs of heterosyllabic short vowels, depending upon the stress pattern. There are, however, three morphemes containing long vowels that do not conform to this generalization. Instead, wherever we would expect to find a sequence of short vowels, these forms show but a single short vowel instead. These irregular alternations are illustrated in (18).

(18) Like Disyllable Shortening (Minor Rule)

o:	to go (pl. subj.)	ó mi	"come"	*oomi
u:	sheltered	unga	"take shelter"	*uunga
pa:	"touch"	paá ki	"print"	pá ki "touch momentarily"

In all three cases, as the suffixless forms demonstrate, the verb root contains two identical vocalic morae, which surface as a long vowel. When a mono-syllabic suffix is added, leading to the placement of primary stress on the second mora, instead of a sequence of two short vowels we find only a single short vowel. The third example is particularly interesting as it shows that one and the same verb root may yield both the regular, disyllabic form, and the irregular short monosyllabic form.

There is one alternative analysis which we must eliminate before we can be certain that a minor rule is necessary. This is the possibility that the long vowels seen in the suffixless forms are derived from underlying short vowels by rule. This seems plausible since Tongan does not have monomoraic major category items, so that one might posit a rule that lengthened underlyingly monomoraic major category items if they do not attain the requisite length through

suffixation.¹¹ Such rules are indeed attested in some Japanese dialects. In the present case, however, we can eliminate this possibility. First, it would not account for the presence of the rearticulated sequence in "to print". Secondly, the long vowel appears not only in suffixless forms but in more complex forms in which the primary stress does not fall on the second mora, as the examples in (19) illustrate. Consequently, the long vowels (or rather the two identical morae) must be underlying.

(19) Long Forms with Long Vowels

u:ngá ki "be sheltered from the wind"
fepa:ʔá ki "to touch each other"

The existence of these irregular forms thus motivates a minor rule deleting one of two identical vocalic morae when they appear in different syllables. This rule will have to be restricted to these three verb roots. It will, moreover, have to have at least one exception, since the specialized form "to print" does not undergo it. But clearly it is impossible to determine whether the environment for the minor rule is met until Syllable Fusion has had a chance to apply, for Syllable Fusion bleeds Like Disyllable Shortening. Consequently, Syllable Fusion precedes Like Disyllable Shortening. But Like Disyllable Shortening is unequivocally lexical since it applies only to three idiosyncratic morphemes, and has a lexical exception to boot. Consequently, Syllable Fusion must itself be lexical.

In sum, Syllable Fusion must be lexical because it requires knowledge of the internal structure of words and because it precedes another lexical rule. Since Definitive Accent Placement precedes Syllable Fusion, Definitive Accent Placement must be lexical.

5. Resolving the Conflict

We have seen that the distribution of the Definitive Accent is phrasal in character, but that the phonological realization of this morpheme is lexical, which is a paradox. To resolve it, either we must abandon the principles that lead us to characterize the definitive morphology as lexical, or we must find some way of obtaining the observed phrasal distribution without actually attaching the morpheme in the syntax. I will here consider only the latter possibility, although it must of course be kept in mind that it might be the notion of lexicality that is in need of revision.

No theory, no matter how strong a lexicalist hypothesis it adopts, maintains a complete separation between the lexical and syntactic components, since to do so would prevent the syntax from having recourse even to syntactic categories, which are, in a sense, a lexical property. Similarly, most current theories of the morphology/syntax interface provide for the fact that in many languages the actual phonological realization of case marking is unequivocally lexical, while needless to say the licensing of a particular grammatical case form is inherently syntactic. This apparent paradox is resolved by letting the morphology, applying in the lexicon, attach features to the word which are then visible in the syntax.

This approach can be extended to the Tongan Definitive Accent. Suppose that we inflect every word (or at any rate, every word that can appear as the rightmost word in an NP), for definiteness, performing the morphophonological operation in the lexicon, and marking the word with a feature which will be visible in the syntax, just as if it were a case feature, for

¹¹ Thanks to Stephen Anderson for raising this possibility.

example. Then we will need to account for two things. First, we must ensure that this feature appears only on words in a semantically definite NP. Second, we must ensure that only the rightmost word in an NP bear this feature. The first task is easily carried out by treating the feature as a *foot feature*, as it is known in Generalized Phrase Structure Grammar where such feature passing and checking mechanisms have been carefully worked out. The second task can be accomplished by means of a linear precedence rule banning anything from appearing to the right of a word marked definite. To be concrete, within the framework of GPSG we may use rules (20) and (21).

(20) LP Rule: $X < [/\text{def}]$

(21) ID Rule: $\text{NP}[+\text{def}] \Rightarrow \text{NP}[/\text{def}]$

Rule (20) ensures that the definite form be the rightmost word in the NP. Rule (21) rewrites a semantically definite NP as an NP that must ultimately dominate a word bearing the definite foot feature. Thus, the existing mechanisms of GPSG provide a means for passing and checking a lexically marked definiteness feature in the syntax.¹² This approach is not terribly novel since the same approach is regularly taken to features that appear on heads, e.g. case on NPs. The only novelty is the use of foot features rather than head features, and the use of the LP rules to keep the feature in the correct position.¹³

In sum, definiteness marking in Tongan presents a paradox in that its distribution is phrasal while its phonological instantiation is lexical. This paradox can be resolved by extending the common use of morphologically attached but syntactically passed and checked features from head features to foot features.¹⁴

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¹² Note that there is nothing in this approach that is incompatible with syntactic theories other than GPSG-it is just that only GPSG has explicitly developed the requisite mechanisms. Indeed, it appears that it may be possible to obtain the same results in the version of the GB theory advocated by Kayne (1983).

¹³ One defect of an approach using LP rules in this way is that it appears to be insufficiently constrained. For example, in the present case the variable X could be replaced with some particular category, say V, to yield a rule putting the definite accent on a word following the rightmost verb in the NP, but it appears that cases like this do not occur. Rather, it appears to be the case (see also Sadock 1984) that misalignments of the morphology with the syntax such as the present one occur only at the edges of constituents. It is unclear whether constraints can be imposed on LP rules to rule out the unwanted cases that will not interfere with the ordinary word-order determining function of LP rules.

¹⁴ During the question period Doug Pulleyblank raised the question of whether these facts might be amenable to treatment by means of recursion from the syntax into the lexicon, which has been suggested a number of times for other cases. This is less attractive than the solution proposed here for several reasons. First, no reasonable approach to constraining recursion from the syntax into the lexicon is known, so that this mechanism appears to be much too powerful. Secondly, in the present case there would be no way to get Syllable Fusion to apply in a form like [ma:ma], the definite of "lamp", without it also applying, incorrectly, across stronger boundaries, unless the morphological locality conditions (i.e. bracket erasure at the end of each stratum) were abandoned.

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