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Iambic Feet in Japanese: Evidence from the Maisaka Dialect

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Abstract: This paper shows that both iambic and trochaic feet are indispensable in the analysis of the accent patterns of both nouns and verbs in the Maisaka dialect. Without referring to foot structure, it is not possible to formulate insightful generalizations that account for gaps in the nominal accent system and for alternations in the accent patterns of both nouns and verbs. The preferred foot type in the Maisaka dialect is the iamb. This is an important finding, as it has been argued that in Tokyo Japanese the preferred foot type is the trochee. Although iambs are preferred in Maisaka Japanese, trochees are allowed in order to avoid accent on the final mora of the phonological word. The Maisaka dialect thus provides us with evidence for the co-existence of iambs and trochees in one and the same accent system.*

Key words: accent, foot structure, Maisaka dialect, mora counting, syllable structure

1. Introduction

The Japanese language exhibits an enormous amount of variation in terms of accent systems (Uwano 1999, 2012, Kubozono 2012). No matter whether one takes a descriptive-typological or a more theoretical approach to the study of accentual variation in Japanese dialects, an important question is to what extent differences in phonological structure are responsible for the observed variation.

For Tokyo Japanese, it has been shown that reference to the metrical foot in the analysis of its accent system enables descriptive and theoretical generalizations that had not been possible in analyses that only relied on moras and syllables (Poser 1990, Kubozono 1995, 1997, Katayama 1998, Ito and Mester 2016). Even so, it seems that more descriptively oriented scholars consider foot structure to be part of the theoretical realm, and therefore less relevant for an insightful description and analysis of the prosodic system of a language than units like the mora and

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the syllable. This may be one of the reasons that not much attention has been paid to the possibility that foot structure plays a role in the distribution of accent in dialects other than Tokyo Japanese.[1]

In this paper, I present evidence that foot structure also plays an important role in other dialects than the Tokyo one. More concretely, I will show that in order to give an insightful account of the accent patterns in the Maisaka dialect, it is necessary to refer to foot structure. What is more, there is a preference for iambic feet rather than trochaic feet. This is an important finding, especially in the light of the fact that the preferred foot in Japanese has been assumed to be the moraic trochee, a conclusion drawn from evidence from prosodic morphology (Ito 1990, Poser 1990, Ito et al. 1996) and from predictable accent patterns in simplex words (Katayama 1998, Ito and Mester 2016).

2. The Maisaka dialect

In this section, relevant data is presented from the dialect spoken in the former town of Maisaka, now part of Hamamatsu City, Shizuoka Prefecture. The Maisaka dialect is interesting because its accent system is what we may call an 'odd-even counting system', i.e. an accent system in which the location of the accent is (partly) determined by whether a word has an even or odd number of moras (μ) and syllables (σ). For many languages, such apparent counting has been shown to be the result of metrical foot structure (see Hayes 1995). To the best of my knowledge, in this sense Maisaka Japanese is unique among Japanese dialects.[2]

The discussion of Maisaka Japanese in this paper is based on data from Yamaguchi (1984), but I have also consulted the studies by Maekawa (1970) and Terada (1970). The data and generalizations given in Yamaguchi (1984) and the other two works are consistent with each other.

2.1. Data

2.1.1. Nouns

In (1), the accent patterns of the isolation forms of nouns consisting of one to five moras are given. Numbers denoting the accent location (in the leftmost column) refer to the *n*th mora counting from the left. Accents are indicated by an accent mark (') on the relevant mora. Unaccented words are indicated with an overbar (¯) to their right.

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[1] A notable exception is a recent study by Matsumori (2012), who proposes that the high tone of the 'rising kernel' in the Aoya dialect (Tottori prefecture) spreads to the right within a binary foot. It should also be mentioned that the foot has been shown to play an important role in a number of varieties of Ryukyuan, a sister branch of Japanese in the Japonic language family. Lawrence (1990) shows that iambic feet are crucial for an understanding of the Nakijin dialect of Okinawan (see also Ogawa 2012). Furthermore, for a number of dialects of the Miyako variety of Ryukyuan, it has been shown that the foot plays an important role in the tonal phonology (Shimoji 2009, Matsumori 2013, Igarashi et al. to appear).

[2] See Lawrence (1990) for a counting system in the Nakijin Okinawan variety of Ryukyuan.

(1) Maisaka Japanese nominal accent (based on Yamaguchi 1984)

	1 mora	2 moras	3 moras	4 moras	5 moras
0	ha¯ 'tooth'	kawa¯ 'river'	suzume¯ 'sparrow'	itazura¯ 'mischief'	atarimae¯ 'ordinary'
1	te' 'hand'	mi'mi 'ear'	ka'iko 'silkworm'	o'okami 'wolf'	ki'nkakuji 'Kinkakuji (temple)'
2		(-)	suga'ta 'figure'	mura'saki 'purple'	migi'hidari 'right-left'
3			atama' 'head'	asaga'o 'morning glory'	(-)
4				otooto' 'younger brother'	daidoko'ro 'kitchen'
5					arigatami' 'value'

Before we move on, some comments on the relation between moras and syllables are in order. In principle, an accent may only be associated with the head mora (i.e. the syllabic mora) of a syllable, as in Tokyo Japanese (see Kubozono 2001). This means that accents on moraic codas of both the nasal (*N*) and obstruent (*Q*) type, as well as on the second part of long vowels and falling diphthongs ending in a high vowel, are avoided.[3] A sequence of a low vowel and a mid vowel, on the other hand, is parsed into two separate syllables, as in *kae'r-u* 'return-nonpast'.

Importantly, the accent patterns of forms followed by particles differ in certain cases from isolation forms. Particles can be defined as non-inflecting functional (as opposed to lexical) morphemes which attach to a word (as opposed to a bound root or stem) and which may have semantic scope over a complex phrase. Under this definition, particles can be seen as a sub-type of clitics, which can be defined more generally as functional morphemes that attach to a word and which may have scope over a complex phrase.[4] Starting with words from two to four moras with particles, there are at least three important generalizations that need an explanation. First, all accented bimoraic nouns have an initial accent in their

[3] Yamaguchi (1984) points out that the verb *toos-u* 'let pass-nonpast' may appear with either accent on the first (*to'os-u*) or the second mora (*too's-u*). Such variation can be accounted for by assuming that forms like this optionally consists of three rather than two syllables.

[4] The definitions of particle and clitic provided here are of a pragmatic and theory-neutral nature. As discussed in Vance (1993), there is no strong evidence for the idea that what have been called particles in studies of Japanese grammar must be analyzed as clitics according to Zwicky's (1985) criteria. Still, there are no strong objections to call Japanese particles clitics, especially when we consider the fact that the category of clitic itself is at best is an 'umbrella term' (Zwicky 1994). Note that I do not refer to phonological dependency in my definitions of particle and clitic. The reason for this is that particles and other clitics are not necessarily phonologically dependent. For instance, at least in Tokyo Japanese, particles and auxiliary verbs may form separate phonological phrases (see Kawakami 1966, Kubozono 1993).

isolation forms (2a). Also, word-initial accent in trimoraic or longer words is only allowed if the accented syllable is bimoraic ((2b-i) and (2c-i)). Furthermore, and most importantly, words that have (i) an even number of syllables and (ii) accent on the penultimate mora in isolation, undergo an accent shift one mora (and syllable) to the right when they are followed by a particle. Examples of this accent shift in forms followed by the nominative particle *=ga* are given in (2a) and (2c-iii), where '=' indicates a boundary between a particle and its syntactic host. Syllable boundaries are indicated by a period.

(2)	a.	a'.me	a.me'.=ga	'rain(=nom)'
	b.i.	ka'i.ko	ka'i.ko.=ga	'silkworm(=nom)'
	ii.	su.ga'.ta	su.ga'.ta.=ga	'figure(=nom)'
	iii.	a.ta.ma'	a.ta.ma'.=ga	'head(=nom)'
	c.i.	o'o.ka.mi	o'o.ka.mi.=ga	'wolf(=nom)'
	ii.	mu.ra'.sa.ki	mu.ra'.sa.ki.=ga	'purple(=nom)'
	iii.	as.a.ga'.o	a.sa.ga.o'.=ga	'morning glory(=nom)'
	iv.	o.too.to'	o.too.to'.=ga	'younger brother(=nom)'

Yamaguchi (1984) accounts for the accent shifts in terms of allomorphs that have different accent specifications depending on the environment. Thus, for the forms in (2a), he would propose different accent patterns: one with an accent on the first mora for the isolation form (/μ'μ/), and one with the accent on the second mora for cases in which the noun is followed by a particle (/μμ'μ(..)/). It should be clear that this description fails to account for the fact that accent shifts only occur in words of certain lengths.

As for the gaps in the accent system, according to Yamaguchi (1984), *ka'iko* and *o'okami* may be analysed as having the underlying forms /kai'ko/ and /oo'kami/, with a constraint against accents on 'special moras' (*tokushu mōra*) that causes the accent to shift to the left. Under this analysis, there are no initially accented nouns longer than two moras. However, a problem for this analysis arises when we take words of four moras into account. Yamaguchi argues that since *asaga'o* and *otooto'* are in complementary distribution in terms of accent, the underlying form of *oto-oto'* can be analyzed as *otoo'to*. However, if this is true, the question is why in this case the accent would shift to the right rather than to the left (**oto'oto*), as in *ka'iko* and *o'okami*. Therefore, it seems better to simply assume that *ka'iko*, *o'okami*, and *otooto'* are specified in the lexicon with the accent on the mora to which it is associated on the surface. However, then we need an explanation for the fact that there are (i) no words consisting of an even number of moras, ending in two light syllables, with final accent ($\mu\mu\mu_{\sigma}\mu_{\sigma}$') in isolation, and (ii) no words consisting of more than two moras, starting with two light syllables, with initial accent (*μ_{σ}'$\mu_{\sigma}\mu$..).

The non-accidental gaps in the accent system that become apparent when we ignore accented heavy syllables are highlighted in (3).

(3) Accent patterns in Maisaka Japanese nouns

	1 mora	2 moras	3 moras	4 moras	5 moras
0	ha¯	kawa¯	suzume¯	itazura¯	atarimae¯
	‘tooth’	‘river’	‘sparrow’	‘mischief’	‘ordinary’
1	te’	mi’mi	*μ_σ’$\mu_\sigma\mu$	*μ_σ’$\mu_\sigma\mu\mu$	*μ_σ’$\mu_\sigma\mu\mu\mu$
	‘hand’	‘ear’			
2		*$\mu\mu$’	suga’ta	mura’saki	migi’hidari
			‘figure’	‘purple’	‘right-left’
3			atama’	asaga’o	*$\mu\mu\mu_\sigma$’$\mu_\sigma\mu$
			‘head’	‘morning glory’	
4				otooto’	daidoko’ro
				‘younger brother’	‘kitchen’
				*$\mu\mu\mu_\sigma\mu_\sigma$’	
5					arigatami’
					‘value’

Words of five or more moras generally consist of multiple morphemes. It is interesting that, depending on the position of the morpheme boundary, accent shifts do or do not occur. In (4a), where the second morpheme consists of three moras, no accent shift is observed. In (4b), where the second morpheme is made up of two moras, the accent does shift to the right when a particle is attached.

(4) a. dai-doko’ro ‘kitchen’
dai-doko’ro=ga ‘kitchen-nom’
b. abura-mu’si ‘plant louse’
abura-musi’=ga ‘plant louse-nom’

Finally, monomoraic words are special in that they exhibit accent shifts even though they have an odd number of moras. As the examples in (5) make clear, the accent shifts when a bimoraic particle is attached, but not when a monomoraic particle follows.

(5) a. te’ ‘hand’
b. te’=ga ‘hand=nom’
c. te=ka’ra ‘hand=abl’

Thus, another question that must be answered is why monomoraic forms pattern with bimoraic and quadrimoraic words rather than trimoraic ones.

2.1.2. Verbs

The same generalizations that hold for nouns also apply to lexically accented verbs. As in most other Japanese dialects, Maisaka Japanese verbs can be divided into two classes in terms of accent: accented and unaccented. Interestingly, in this dialect verbs with unaccented roots do not contain an accent on suffixes that do appear with an accent in Tokyo Japanese. For example, whereas a conditional

form with an unaccented root in Tokyo Japanese appears with an accent on the suffix (*X-ta'ra*, where 'X' stands for an unaccented root), in Maisaka Japanese the whole form is realized without an accent (as *X-tara*-). Therefore, unaccented verbs are irrelevant to the topic of this paper, and will not be treated any further. In (6) examples of verbs with a lexically accented root ending in a vowel ('V-verbs') are given. For three different verbs, six different conjugational forms are given. The three verbs have non-past forms of two moras, three moras, and four moras, which are henceforth referred to as bimoraic, trimoraic, and quadrimoraic verbs. The conjugations are divided into two 'sub-paradigms': those in which the inflectional suffix has an allomorph starting with the phoneme /r/ ('R-forms'), and those with inflectional suffixes starting with either /t/ or /d/ ('T-forms'; the examples given here all contain the allomorph starting with /t/). Note that some of the 'inflectional categories' in (6) are realized by a combination of an inflectional suffix and a particle.

(6) Accent patterns in Maisaka Japanese V-verbs

Sub-paradigm	Inflectional category	Morphemes	Example 'see'	Example 'eat'	Example 'gather'
'R-forms'	non-past	-(r)u	mi'-ru	tabe'-ru	atume'-ru
	transitional	-(r)u=to	mi-ru'=to	tabe'-ru=to	atume-ru'=to
	provisional	-(r)yaa	mi-rya'a	tabe'-ryaa	atume-rya'a
'T-forms'	past	-ta	mi'-ta	tabe'-ta	atume'-ta
	gerund=foc	-te=mo	mi-te'=mo	tabe'-te=mo	atume-te'=mo
	conditional	-tara	mi-ta'ra	tabe'-tara	atume-ta'ra

Based on the forms in (6), the following generalizations can be stated. In what may be called the most 'basic' forms of the two sub-paradigms, the non-past and the past forms (and/or the simple gerund form in *-Te*, which is not given here), the accent falls on the stem-final vowel. These forms are 'basic' in the sense that (i) they contain a suffix with a length of maximally one mora and (ii) they are not followed by a particle. The 'non-basic' forms of the paradigm, on the other hand, contain either polymoraic inflectional suffixes or a monomoraic suffix followed by a particle. In other words, the distinction between 'basic' and 'non-basic' forms can be referred to as one of monomoraic vs. polymoraic inflections.[5] In 'non-basic'

[5] I would like to thank an anonymous reviewer for proposing to define the distinction between 'basic' and 'non-basic' in terms of mora count. However, I would like to point out that this is only possible if the distinction between monomoraic and polymoraic inflections is defined in terms of 'morphs' rather than morphemes or inflectional categories. The reason for this is that allomorphy in the imperative forms complicates the situation. The imperative has two allomorphs, only one of which is monomoraic. The monomoraic allomorph *-e* attaches to C-verbs behaves exactly like the other suffixes of 'basic' forms. However, the allomorph *-yoo*, which attaches to V-verbs, is bimoraic. What is more, in forms with the allomorph *-yoo*, the stem-final V is deleted, the result of which is that in any form ending in

forms of verbs whose basic forms have an even number of moras (two or four), the accent falls one syllable to the right of what is the accented syllable in the basic non-past and past forms. Thus, compared to the basic forms, the non-basic forms of *mi-* 'to see' and *atume-* 'to gather (transitive)' show an accent shift of one mora/syllable to the right. Although it is not necessary to take the term 'accent shift' too literally for non-basic forms that do not unambiguously contain the basic forms (as is the case in the transitional form, which arguably is formed by attaching the particle *=to* to the non-past form), it should be clear that when counting from the left, the verbs *mi-* and *atume-* have what we may call 'mobile' accents, whereas the accent is 'fixed' in the different conjugations of the verb *tabe-*, which has basic forms with an odd number of moras (*tabe-ru* 'eat-nonpast' and *tabe-ta* 'eat-past').

The same difference between verbs with an even number and those with an odd number of moras can be observed in verbs with a root ending in a consonant (C-verbs). As shown in (7), when the basic non-past form has an even number of moras (*ka'k-u* 'write-nonpast', *atuma'r-u* 'gather-nonpast (intransitive)'), the accent in the non-basic R-forms falls one mora to the right compared to the non-past form (e.g. *kak-u'=to* 'write-nonpast=trans' and *atumar-u'=to* 'gather-nonpast=trans'). The same kinds of accentual alternations are not observed in the paradigm of verbs with non-past forms of an odd number of moras, such as *aru'k-u* 'walk-nonpast'). An important difference from the paradigm of V-verbs is that in the sub-paradigm of T-forms of C-verbs, the accent does not shift. For instance, in both the past and conditional forms *ka'i-ta* 'write-past' and *ka'i-tara* 'write-cond', the accent is located on the same mora. As can be seen in (7), the same is true for all other T-forms of verbs of any length.

(7) Accent patterns in Maisaka Japanese C-verbs

Sub-paradigm	Inflectional category	Morphemes	Example 'write'	Example 'walk'	Example 'gather'
'R-forms'	non-past	-(r)u	ka'k-u	aru'k-u	atuma'r-u
	transitional	-(r)u=to	kak-u'=to	aru'k-u=to	atumar-u'=to
	provisional	-(r)yaa	kak-ya'a	aru'k-yaa	atumar-ya'a
'T-forms'	past	-ta	ka'i-ta	aru'i-ta	atuma't-ta
	gerund-foc	-te=mo	ka'i-te=mo	aru'i-te=mo	atuma't-te=mo
	conditional	-tara	ka'i-tara	aru'i-tara	atuma't-tara

this suffix, the accent surfaces on the penultimate mora, as in *m-yo'o* 'see-imp', *tab-yo'o* 'eat-imp'. In other words, the allomorph *-yoo* seems to behave like an accent-attracting affix. In this sense, forms ending in *-yoo* resemble forms ending in the negative marker *-(a)n*, which also invariably have an accent on the penultimate mora when attached to an accented root. The reason why the imperative is excluded from the analysis in this paper is that Yamaguchi (1984) does not present imperative forms for verbs with longer roots like *atume-* 'gather'.

This means that the generalization stated above that the accent falls on the stem-final vowel in basic forms can be reformulated as follows: in basic forms of accented verbs, the accent falls on the syllable containing the stem-final vowel. For V-verbs, I added to this the generalization that in non-basic forms whose basic forms have an even number of moras the accent falls one mora/syllable to the right compared to basic forms. However, because of the stem-final heavy syllables in T-forms, this generalization does not hold for C-verbs. Thus, in order to capture the accent patterns in terms of mora and syllable structure alone, again we need to add a statement that if the stem ends in a heavy syllable, the accent is invariably assigned to this syllable, even in non-basic forms, independent of the length of the basic forms.

It should be clear that the accent alternations in the verbal paradigm must conform to the same patterns as the accent shifts that can be observed in nominal forms. Furthermore, the same generalizations hold for adjectives, which are not discussed in this paper.

To summarize, in this section it was shown that in the Maisaka dialect, both nominal and verbal constructions show accent alternations that are sensitive to the number of moras of which the forms consist. However, the description offered in this section is incomplete, in that the following issues remain to be accounted for in a satisfactory way:

(8) a. How can we account for the gaps in the nominal accent system?
b. How can we account for the presence vs. the absence of accent shifts that, except for monomoraic words, depend on whether a word has an even or odd number of moras?
c. How can we account for the fact that the accentual alternations in inflectional forms of verbs are also dependent on mora count?

Note that the above questions are important at the most basic descriptive level. The way in which the generalizations have been stated in this section cannot be called very elegant, which suggests that richer phonological representations are needed to come up with an insightful descriptive account of the data, formal analysis aside.

3. A foot-based analysis

3.1. Nouns

Based on the observation that a distinction is made between even and odd numbers of moras/syllables, we naturally suspect that foot structure is involved. The question then is what this foot structure looks like and what constraints it is subject to.

Let us start with words with an even number of moras and syllables. The foot structure of such words should be relatively straightforward because we do not have the problem of stray syllables. Based on the claims made for Tokyo Japanese, let us assume that feet are bimoraic. The foot structure of *a'me*, *asaga'o*, and *mura'saki* would then be as in (9). The prosodification of particles is ignored for the moment.

(9)	a.	(a'me)	(ame')=ga	'rain(=nom)'
	b.	(asa)(ga'o)	(asa)(gao')=ga	'morning glory(=nom)'
	c.	(mura')(saki)	(mura')(saki)=ga	'purple(=nom)'

If these are the metrical parses of words with an even number of moras and syllables, we now can say that accents only shift within a foot (9a/b) and not across foot boundaries (9c). Furthermore, the difference in accent location within the foot between (9a/b), where the accent is associated to the left-hand mora/syllable, and (9c), where the accent is associated to the right-hand mora, can be taken as the reason for the presence of a shift in the former forms, and the absence of a shift in the latter. That is, the accent only shifts if leaving the underlying accent in place would yield a left-accented foot rather than a right-accented one.

(10) Foot structure preference in Maisaka Japanese:
Right-accented feet ('iambs') are preferred to left-accented feet ('trochees').

One may wonder whether the right-accented feet are really iambs, or whether they are trochees in which the accent is associated to the non-head of the foot.[6] Below I will present further evidence from verbal forms for the idea that right-accented feet in Maisaka can be assumed to be iambs.

The isolation forms in (9a/b) show that left-accented feet are allowed if placing the accent to the right-hand mora of the foot would result in the accent being final in the word. The fact that word-final accent is possible in (9a/b) when a particle follows suggests that a word and a particle form a domain that is equivalent to the domain of a word in isolation. In other words, final accent is avoided in a word or a word-particle combination. How this domain should be defined is a difficult question. In the descriptive Japanese accentological literature, a domain that consists of a noun or verb followed by one or more functional morphemes is called *bunsetsu* or 'syntagma' (Uwano 1999, 2012). However, it is not clear whether such a syntactically defined domain is really the domain that is relevant. That is, it cannot be ruled out that, phonologically, particles can be phrased separately from the preceding noun, as is possible in Tokyo Japanese (Kawakami 1966, Kubozono 1993). If particles can indeed form separate phonological phrases in Maisaka Japanese, it could be that attaching a particle to words like *a'me* or *asaga'o* would not cause the accent to shift. In that case, it would be better to define the domain in terms of phonology, because regardless of the phonological phrasing of the particle, under the definition of syntagma given above, a word-particle combination would still be a syntagma. Another reason for defining the domain in terms of phonology is that it makes more sense for the domain of a phonological constraint to be phonological rather than non-phonological. However, it is not immediately clear how the relevant domain should be defined phonologically. It has been suggested in the literature that the *bunsetsu* or syntagma corresponds to the phonological word

[6] See Katayama (1998) for an analysis of Tokyo Japanese loanwords in which feet are assumed to be left-headed in all cases, with accents being able to associate to foot-non-heads and unfooted syllables.

(Poser 1984, among others). However, it is only possible to analyze the relevant domain in Maisaka Japanese as a phonological word if we distinguish between lexical and post-lexical phonological words. Under this analysis, lexical words are mapped onto a lexical phonological word, with particles being incorporated in the phonological word post-lexically (see also Zec 1994: 96–97). The reason why we need to distinguish between the two types of phonological words is that, as shown below, except in the case of monomoraic words, a foot may not straddle the boundary between a lexical word and a particle. This makes sense if a lexical word is mapped onto a phonological word, the latter of which functions as the domain in which feet are built. If the post-lexical phonological word differs from the lexical phonological word in that it includes the particle, the failure of the first or only syllable of a particle to be parsed into a foot with the final syllable of the preceding word can be accounted for by positing a constraint that lexically built foot structure in principle may not be altered post-lexically. The structure of phonological words in simplex and complex forms is exemplified in (11), where 'PW' stands for phonological word.

(11)	*Lexical structure*	*Post-lexical structure*	
a.	$[(a'me)]_{PW}$	$[(ame')=ga]_{PW}$	'rain(=nom)'
b.	$[(asa)(ga'o)]_{PW}$	$[(asa)(gao')=ga]_{PW}$	'morning glory(=nom)'
c.	$[(mura')(saki)]_{PW}$	$[(mura')(saki)=ga]_{PW}$	'purple(=nom)'

Alternatively, we may define the relevant domain as the so-called 'clitic group' (Nespor and Vogel 1986). This seems to make sense from the point of view that particles are instances of clitics. Furthermore, by adopting the clitic group it becomes unnecessary to distinguish between lexical and post-lexical phonological words (although we may still distinguish between lexical and post-lexical structure). This is shown in (12), where 'CG' stands for clitic group.

(12)	*Lexical structure*	*Post-lexical structure*	
a.	$[(a'me)]_{PW}$	$[[(ame')]_{PW}=ga]_{CG}$	'rain(=nom)'
b.	$[(asa)(ga'o)]_{PW}$	$[[(asa)(gao')]_{PW}=ga]_{CG}$	'morning glory(=nom)'
c.	$[(mura')(saki)]_{PW}$	$[[(mura')(saki)]_{PW}=ga]_{CG}$	'purple(=nom)'

While the approach based on the clitic group may have its advantages, the clitic group is a controversial category, and there is independent cross-linguistic motivation for a distinction between lexical and post-lexical prosodic structure (Booij 1996, Peperkamp 1997). Furthermore, in Maisaka Japanese there is evidence from monomoraic words that a foot may contain material from a particle in order to satisfy a constraint that the initial foot of a phonological word be binary. In an approach that assumes a distinction between lexical and post-lexical structure, this can be interpreted as evidence for post-lexical restructuring of the foot and the phonological word that dominates it. In the approach based on the clitic group, on the other hand, it is necessary to assume that clitics are not always directly parsed into the clitic group. Another drawback of the approach based on the clitic group is that for isolation forms it is necessary to posit clitic groups that domi-

nate a phonological word in a construction that does not contain a clitic. Based on these arguments, in this paper I tentatively propose that the domain in which final accent is avoided is the phonological word. The Non-Finality constraint that is responsible for the absence of accent shifts in isolation forms is defined in (13). This constraint is only violated in forms in which the accent is 'trapped' within a word-final monomoraic foot. Because there is no evidence that this constraint is not also relevant for lexical phonological words, it suffices to define the domain as 'phonological word'.

(13) Non-Finality:
The accent is not associated with the final mora of the phonological word.

I would like to stress that in an approach that does not distinguish between lexical and post-lexical phonology, it seems necessary to adopt the clitic group.[7] An analysis based on the clitic group would only differ in minor ways from the analysis based on the distinction between the lexical and post-lexical phonological word, and will therefore not be considered any further.

Let us now turn to the question of the accent in polymoraic nouns with an odd number of moras and syllables, examples of which are given in (14) below. The absence of such words with an initial accent (14a) can be explained by the fact that even if at the underlying level initial accent is posited, they will surface with peninitial accent, satisfying the iambic constraint (10). Furthermore, the absence of such forms also suggests that trimoraic forms always start with an initial bimoraic foot. In other words, feet are built from left to right, rather than right to left. This is also clear from the absence of morphologically simplex trimoraic words that show an alternation between peninitial/penultimate accent and final accent. If feet were built from right to left, as in the (wrong) hypothetical isolation form in (14b-ii) marked by "?", the accent would shift in forms accompanied by a particle, which is not the case. If, as argued below, the foot structure of words in isolation generally is identical to that of complex forms, this means that the hypothetical isolation form can also be ruled out. Assuming a word-initial bimoraic foot in trimoraic/trisyllabic words with final accent as in (14c-i) also explains why the accent of such words does not shift to the left in the isolation form (14c-ii). As we will see below, such unaccented feet, which may be called 'covert feet' (Bennett 2012) as they have no clear phonetic correlates, also play an important role in the verbal accent

[7] Note that there are at least two more possible analyses. First, we could assume that the domain of foot structure building is the morpho-syntactic word rather than the phonological word, and that the phonological word corresponds to what in this paper is called the post-lexical phonological word. However, this approach is not in line with the basic assumptions of the most commonly accepted theories of prosodic structure. In another approach, what I call lexical and post-lexical phonological words could be treated as minimal and maximal instances of phonological words (Ito and Mester 2007). However, if compounds are maximal phonological words themselves, as claimed by Ito and Mester (2007), the distinction between lexical vs. post-lexical phonological words (or between the phonological word vs. the clitic group) seems necessary in this approach as well.

system. Note that I assume that the final syllable of final-accented words is parsed into a monomoraic/monosyllabic foot. This seems to be a natural assumption from the point of view that accents must be associated to footed material in order to be 'licensed'. That is, the accent must be located in a syllable that heads a foot, which is a prosodically strong position compared to a dependent syllable that is adjoined to higher level structure. The form with the particle *=demo* ('even') attached in (14d-i) shows that feet may not straddle word boundaries, for otherwise the accent would be expected to shift when a bimoraic particle follows the noun (14d-ii). This can be accounted for if (i) lexical words are mapped onto lexical phonological words, which form the domain of foot structure building, and (ii) these lexically built feet may not be restructured post-lexically. While this holds true for most forms, below it will be shown that monomoraic words are an exception to the constraint against post-lexical restructuring of feet.

(14)	*Underlying*		*Isolation form*	*Complex form*	*Gloss*
a.i.	$\sigma'_{\mu}\sigma_{\mu}\sigma_{\mu}$	→	$(\sigma_{\mu}\sigma'_{\mu})\sigma_{\mu}$	$(\sigma_{\mu}\sigma'_{\mu})\sigma_{\mu}$=ga	'..(=nom)'
ii.	$\sigma_{\mu}\sigma'_{\mu}\sigma_{\mu}$	→	$(\sigma_{\mu}\sigma'_{\mu})\sigma_{\mu}$	$(\sigma_{\mu}\sigma'_{\mu})\sigma_{\mu}$=ga	'..(=nom)'
b.i.	suga'ta	→	(suga')ta	(suga')ta=ga	'figure(=nom)'
ii.	suga'ta	→	ʔsu(ga'ta)	*su(gata')=ga	'figure(=nom)'
c.i.	atama'	→	(ata)(ma')	(ata)(ma')=ga	'head(=nom)'
ii.	atama'	→	*a(ta'ma)	ʔa(tama')=ga	'head(=nom)'
d.i.	atama'	→	(ata)(ma')	(ata)(ma')=demo	'(even a) head'
ii.	atama'	→	(ata)(ma')	*(ata)(ma=de')mo	'(even a) head'

The trimoraic loanwords that can be found in Yamaguchi (1984) have peninitial/penultimate accent, for example *tere'bi* 'television', *teni'su* 'tennis', and *kana'da*. This is again expected if words preferably start with a right-headed foot: *(tere')bi, (teni')su, (kana')da*.

Thus, trimoraic forms provide us with evidence for two important features of the foot-building process. First, feet are built from left to right within the phonological word. Second, restructuring of lexically built feet is avoided. Together with the other foot structure preferences discussed above, the 'foot structure principles' for Maisaka Japanese can be summarized as in (15). These are defined as preferences rather than inviolable constraints. The reason for this is that the different preferences are not always compatible with each other.

(15) Foot structure principles in Maisaka Japanese
   a. Binary feet are built from left to right.
   b. Monomoraic feet are allowed if they carry an accent.
   c. Within the accented foot, the accent is associated to the head mora of the right-hand syllable, except if this would result in final accent in the phonological word.
   d. Foot restructuring (in the post-lexical phonological word) is avoided.

Reference to the 'head mora' of the syllable in (15c) is necessary because if the accented foot consists of a heavy syllable, the accent falls on the left-hand mora, as

in (16b).

(16) a. (a'.me) (a.me'.)=ga 'rain(=nom)'
b. (ka'i.)ko (ka'i.)ko.=ga 'silkworm(=nom)'

The difference between disyllabic forms consisting of two light syllables (16a) and words consisting of a heavy syllable followed by a light syllable (16b) is important for another reason: it provides us with evidence for the idea that that uneven trochees consisting of an initial heavy and a following light syllable ($\sigma_{\mu\mu}\sigma_{\mu}$) are not allowed. Thus, in forms like *ka'iko=ga* the accent stays on its underlyingly specified position because it is impossible to build a disyllabic foot with an initial heavy syllable. This forms important evidence for the idea that we are dealing with genuine iambs.

The constraint in (15d) is based on the fact that no accent shifts can be observed in forms like *atama'=demo* (14d-ii): a monomoraic accented foot is preferred to a bimoraic/disyllabic foot that incorporates the first mora/syllable of the particle. As discussed above, this suggests that lexical words are mapped onto phonological words, which form the domain of foot structure building. Further evidence for this idea comes from morphologically complex words of 5 moras. Under the assumption that compounds of this length consist of two phonological words, which together form another phonological word that is omitted from the representations in (17), the existence of both shifting and non-shifting forms among 5μ-compounds receives a natural explanation. In (17a), the accented foot is non-final in both the isolation form (17a-i) and the form followed by a particle (17a-ii). In (17b), on the other hand, an iambic foot is avoided in the isolation form in order to prevent final accent in the phonological word (17b-i). In the same form with a particle, the accent can be shifted to the right, because the particle is incorporated in the post-lexical phonological word (17b-ii). Thus, the even/odd distinction is also relevant for the second members of compounds, so that compounds of the same length but with different internal structures have the accent on different locations.

(17) a.i. $[(\text{dai})]_{PW}\,[(\text{doko'})\text{ro}]_{PW}$ 'kitchen'
ii. $[(\text{dai})]_{PW}\,[(\text{doko'})\text{ro=ga}]_{PW}$ 'kitchen=nom'
b.i. $[(\text{abu})\text{ra}]_{PW}\,[(\text{mu'si})]_{PW}$ 'plant louse'
ii. $[(\text{abu})\text{ra}]_{PW}\,[(\text{musi'})\text{=ga}]_{PW}$ 'plant louse=nom'

Let us now move on to accented monomoraic words. As discussed above, in such words, the accent shifts to the right when a bimoraic particle follows. This implies that a particle that follows a monomoraic noun is parsed into the same phonological word as this noun, as in (18b/c/d).

(18) a. te' $[(\text{te'})]_{PW}$ 'hand'
b. te'=ga $[(\text{te'=ga})]_{PW}$ 'hand=nom'
c. te=ka'ra $[(\text{te=ka'})\text{ra}]_{PW}$ 'hand=abl'
d. te=nya'a $[(\text{te=nya'a})]_{PW}$ 'hand=dat.top'

Because an accent may only shift within a foot, it must be the case that the first syllable of the particle is incorporated into the foot and the phonological word in (18c/d). This implies that in the case of monomoraic words, lexical foot structure is restructured post-lexically. The reason why monomoraic nouns show this exceptional behaviour could be related to general constraints on prosodic structure. Many languages are subject to a minimality condition according to which the prosodic word must consist of a foot (McCarthy and Prince 1986). Such a constraint has been shown to be relevant in prosodic-morphological processes in (standard) Japanese (Ito 1990, Ito and Mester 1992). Ito and Mester (1992, 2016) show that in (standard) Japanese, this foot must be word-initial. This idea can be captured by the informally defined constraint in (19). Violations of this constraint only seem to be allowed in monomoraic nouns in isolation.

(19) Word-Initial Foot:
A phonological word starts with a binary foot (σσ and/or μμ).

Because the exceptional behavior of monomoraic words can be explained in terms of a cross-linguistically valid constraint that has been shown to play a role in the prosodic morphology of other Japanese dialects (including the standard), monomoraic words provide us with extra evidence for the idea that foot structure plays an important role in the computation of the accent location.

Note that if we adopt the constraint in (19), it may not even be necessary to stipulate the direction of foot construction. If the initial foot is defined as the head foot, and the head foot is preferably binary, the direction of footing follows from this (see van der Hulst 1984, van der Hulst and Ritter 1999).

Returning to the forms in (18), note that the final mora of *te=nya'a* 'hand=dat. top' in (18d) is assumed to be part of an iambic foot in the classical sense, i.e. a foot consisting of an initial light syllable followed by a heavy syllable. I prefer this analysis over an analysis in which a foot may straddle a syllable boundary, resulting in for instance *(te=nya')a*. The reason for this is that the parse *(te=nya'a)* nicely fits with the observation that Maisaka Japanese prefers the accent to fall on the right-hand syllable of the foot, which makes sense from the point of view of an iambic analysis. Furthermore, mismatches between syllable and foot boundaries are impossible under the assumption that syllables must be contained in feet, observing the inviolable principle of proper bracketing (Nespor and Vogel 1986).

As pointed out above, uneven trochees consisting of an initial heavy and a following light syllable ($\sigma_{\mu\mu}\sigma_{\mu}$) are not allowed. Based on this and the facts discussed above, the foot inventory of the Maisaka dialect can be summarized as in (20). Monomoraic feet are allowed only in word-final position, and only when accented. Note that the bimoraic/disyllabic foot ($\sigma_{\mu}\sigma_{\mu}$) has two variant forms: ($\sigma_{\mu}\underline{\sigma}_{\mu}$) and ($\underline{\sigma}_{\mu}\sigma_{\mu}$), where underlining indicates the head syllable of the foot. The latter variant, which only occurs in phonological-word-final position, is the only foot that cannot be defined as an iamb.

(20) Possible and impossible feet in Maisaka Japanese:
Allowed: $(\sigma_{\mu}\sigma_{\mu\mu})$, $(\sigma_{\mu}\sigma_{\mu})$, $(\sigma_{\mu\mu})$, (σ_{μ})
Not allowed: $(\sigma_{\mu\mu}\sigma_{\mu})$

In (21), the role of different types of foot structure in the nominal accent system is schematically summarized. The gaps in the accent system can be attributed to repairs required by the grammar if these non-existent (isolation) forms are posited as underlying.

(21) Gaps in the accent system: the role of foot structure

	1 mora	2 moras	3 moras	4 moras
1	(te')	(mi'mi)	*(μσ'μσ)μ	*(μσ'μσ)(μμ)
			→(μσμ'σ)μ	→(μσμ'σ)(μμ)
2		*(μμ')	(suga')ta	(mura')(saki)
		→(μ'σμσ)		
3			(ata)(ma')	(asa)(ga'o)
4				(otoo)(to')
				*(μμ)(μσμσ')
				→(μμ)(μ'σμσ)

3.2. Verbs

In this section, I will show that the foot-based analysis for nouns can be naturally extended to verbs. The metrical structure of different inflected forms of V-verbs is presented in (22). As the footing of syllables that follow the accented syllable is not directly relevant to the present discussion, it is omitted from the representations.

(22) Metrical structure and accent in Maisaka Japanese V-verbs

Sub-paradigm	Inflectional category	Example *mi-* 'see'	Example *tabe-* 'open'	Example *atume-* 'gather'
'R-forms'	non-past	(mi'-ru)	(tabe')-ru	(atu)(me'-ru)
	transitional	(mi-ru')=to	(tabe')-ru=to	(atu)(me-ru')=to
	provisional	(mi-rya'a)	(tabe')-ryaa	(atu)(me-rya'a)
'T-forms'	past	(mi'-ta)	(tabe')-ta	(atu)(me'-ta)
	gerund-foc	(mi-te')=mo	(tabe')-te=mo	(atu)(me-te')=mo
	conditional	(mi-ta')ra	(tabe')-tara	(atu)(me-ta')ra

The metrical structure in verbs is assigned according to the same principles as in nouns. Thus, binary feet are built from left to right. The foot that contains the stem-final vowel receives the underlying accent, the location of which need not to be underlyingly specified. In quadrimoraic verbs, the accented foot is preceded by an unaccented (covert) foot, the presence of which explains why forms like **a(tsume')ru* ('gather-nonpast') are not attested. Covert feet thus play a crucial role in the verbal accent system.[8]

[8] Unaccented feet have also been shown to play an important role in Tokyo Japanese (Ito

The difference between basic forms with an even number of moras and those with an odd number of moras is that in the former, this foot is right-aligned with the word boundary (e.g. *(mi'ru)* 'see-nonpast'), while in the latter it is not (e.g. *(tabe')-ru* 'eat-nonpast'). Because basic forms form a phonological word, associating the accent to the right-hand syllable of the foot would result in an accent on the final mora of this phonological word, which is avoided in the Maisaka dialect. Therefore, in basic forms with an even number of moras, the accented foot is a trochee rather than an iamb. In the non-basic forms, however, associating the accent to the right-hand syllable of the foot containing the stem-final vowel does not result in final accent in the phonological word. In V-verbs with basic forms consisting of an odd number of moras, the stem-final vowel will always be dominated by a mora that belongs to the rightmost syllable of the foot, as in *(tabe')-ru* 'eat-nonpast'. Therefore, no accent alternations based on mora count can be observed for verbs of this type.

Let us now move on to C-verbs. As we can see from the forms in (23), the foot-based generalization proposed for V-verbs also holds for C-verbs: the accent is located in the foot that contains the stem-final vowel.

(23) Metrical structure and accent in Maisaka Japanese C-verbs

Sub-paradigm	Inflectional category	Example *kak-* 'write'	Example *aruk-* 'walk'	Example *atumar-* 'gather'
'R-forms'	non-past	(ka'k-u)	(aru')k-u	(atu)(ma'r-u)
	transitional	(kak-u')=to	(aru')k-u=to	(atu)(mar-u')=to
	provisional	(kak-ya'a)	(aru')k-yaa	(atu)(mar-ya'a)
'T-forms'	past	(ka'i)-ta	(aru'i)-ta	(atu)(ma't)-ta
	gerund-foc	(ka'i)-te=mo	(aru'i)-te=mo	(atu)(ma't)-te=mo
	conditional	(ka'i)-tara	(aru'i)-tara	(atu)(ma't)-tara

The foot-based generalization holds for both R-forms and T-forms, which means the foot-based approach has a clear advantage over the introductory description presented in section 2.1.2. That is, in a description in which no reference is made to foot structure, it is necessary to specify whether the basic forms have an even and odd number of moras, which requires counting. On top of this, we need to refer to the type of syllable in which the accent is located in the basic forms. By introducing the foot, however, the following general 'verbal accent assignment principle' can be posited for both V-verbs and C-verbs.

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and Mester 2016). It should be pointed out that it could be that 'covert feet' actually do have phonetic correlates. In a recent study, Kawahara et al. (2014) propose that jaw displacement may be a correlate of metrical foot structure in Tokyo Japanese. Whether the metrical structure proposed in Kawahara et al. (2014) is compatible with the foot structure that is needed to compute the location of accent, and whether similar phonetic correlates can be found in dialects other than Tokyo Japanese are important questions that await further research. The Maisaka dialect would be an interesting test case as its accent system is based on a preference for iambic feet.

(24) Verbal accent assignment principle:
The accent falls on the foot that contains the stem-final vowel.

While the generalization in (24) is stated in terms of syntagmatic structure, we could also state the generalization in paradigmatic terms. In such an approach, the accent can be said to fall on the rightmost foot in the basic forms of the sub-paradigms. The accent in non-basic forms within the same sub-paradigm can then be derived from that of the basic form by means of paradigmatic relations.

Regardless of whether we adopt a syntagmatic or paradigmatic approach to verbal accent, reference to metrical foot structure makes it possible to state the generalizations in an insightful and economical way. As in the nominal accent system, iambic feet are preferred, but trochaic feet may surface under certain conditions.

4. Conclusion

In this paper, I have argued that the metrical foot is an indispensable unit in the analysis of both the nominal and the verbal accent system of Maisaka Japanese. Without reference to foot structure, it is not possible to state the most basic descriptive generalizations in an insightful way.

The dialect is important from a typological viewpoint, as it provides us with evidence for the coexistence of right- and left-headed feet in a single system and for the presence of unaccented feet. The evidence for the idea that left-headed and right-headed feet coexist in the same system is interesting in light of the different analyses that have been proposed for Tokyo Japanese. While for default accent in simplex words it seems to be possible to account for most forms by allowing only trochaic feet (Ito and Mester 2016), analyses of compound accent suggest that left-headed and right-headed feet coexist (Kubozono 1995, 1997, Tanaka 2001, among others). The latter type of analysis is clearly needed for Maisaka Japanese. However, an important difference between the two dialects is that whereas the preferred foot type is the trochee in the Tokyo dialect, the iamb is preferred in the Maisaka dialect.

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【要　旨】

日本語における弱強格フット
——舞阪方言からの証拠——

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本論文では，舞阪方言のアクセント体系を妥当に記述するために弱強格と強弱格という二種類のフットが必要であることを指摘する。フットを仮定せずに名詞のアクセント体系における体系的空白と，名詞・動詞ともに見られるアクセント交替を説明することはできない。興味深いことに，舞阪方言においては，東京方言と違い，強弱格より弱強格が優先される。強弱格も現れ得るが，語末モーラへのアクセント付与を回避するためだけであり，これ以外の場合は弱強格が選ばれる。これは，二種類のフットが同一言語のアクセント体系の中に共存し得ることを示す。