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Metrical Structure in Tokyo Japanese
— Accentuation and Accent Shifts —

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This paper is divided into two parts.[1] In the first part, which deals with Tokyo Japanese noun compound accentuation, I suggest that, in order to avoid including an ad hoc stipulation in the phonology of Japanese, it is necessary to assume that accent is assigned by an unbounded metrical tree. The second part of this paper treats accent shift caused by a vowel devoicing process, and it is seen that this produces strong independent evidence supporting the unbounded tree proposed in the first part.

In what follows, all references to 'Japanese' are to be understood as references to the Tokyo dialect of Japanese. And as I shall not be concerned with the segmental phonology here, no importance is to be attached to the transcription I use. The format of metrical trees used in this paper follows that of Leben (1982: 181-3), Halle and Clements (1983: 16-25) and Rappaport (1984: 49-50). Extrametrical units are enclosed in parentheses.

— Compound Accentuation —

1. Background.

McCawley devotes about one third of his monograph (McCawley 1968) to Japanese accent, and notes (p. 130) that accentuation is "the one area of Japanese phonology containing many phenomena of which there is as yet no really adequate description; for example, the only at all comprehensive treatment ... of accent placement in two-element Sino-Japanese compounds is the rather large set of quite ad hoc rules given in Kindaichi Haruhiko's Meikai Akusento Jiten ..." Since 1968 however, most work on Japanese accent has concentrated on accent actuation processes (those processes which give phonological interpretations to accented and unaccented lexical units), but,

except to point out some parallelisms between one proposed analysis and the rules which I propose in section 4, I shall not deal with the field of accent realisation here. Here I shall deal with the assignment of accents in noun compounds, a process which is of course situated deeper in the phonology than the above-mentioned accent actuation rules and is the aim of the appendix of Meikai Akusento Jiten (hereafter Kindaichi 1981). However this appendix comprises (at least) 99 rules, far too many for a realistic grammar. McCawley deals with accent assignment in two types of noun compounds which I discuss in section 2 below. For convenience, I call the first member of a compound X, and the second member Y. A compound is thus X+Y.

2. 'Short' and 'long' compounds.

There is a basic difference in the distribution of accents in compounds, depending on the length of the second element. If the last element of the compound is 1 or 2 moras long, the distribution is different from (and less regular than) when the last element is of 3 or more moras. This difference in length is the basic distinction underlying McCawley's (1968: 162-3) 'long' and 'short' elements which is adopted as such by Tateishi (1984) and in a slightly changed form by Higurashi (1983: 74). But what is the difference between 2 and 3 moras? Why not a difference between 3 and 4 moras, or 10 and 11 moras?

2.1. Short compounds — X+Y where X is 3 or more moras and Y is 1 or 2 moras.

There are 3 accent types:[2]

(1) a —*—+OO

makuwa*uri 'type of musk-melon' (*uri 'gourd')

bikkuri*bako 'jack-in-the-box' (hako 'box')

—*—+O

koosi*do 'lattice door' (to 'door')

kabura*ya 'whistling arrow' (*ya 'arrow')

b ——+OO

sakuramura 'Sakura village' (mura* 'village')

todokesaki 'receiver's address' (saki 'destination')

——+O

onsenba 'spa' (ba 'place')

hidarite 'left hand' (te* 'hand')

c ——+O*O

garagarahebi* 'rattlesnake' (hebi* 'snake')

matubadue* 'crutches' (tue* 'stick')

As McCawley correctly points out, the accent type is decided by Y. The table in (2) gives the numbers of Y's belonging to each group in the lists given in McCawley (1968: 168, 184-9) and the number of additional Y's picked up in a brief check through a dictionary.

(2)

	a	b	c
McCawley	141	68	13
me	37	13	9

It can be seen that a is by far the most common, and I assume that it is the unmarked accent.[3]

In a, Y's of all accent types, (OO, O*O, *OO), are found when standing alone (eg. hako 'box', kawa* 'river', *nusi 'master'). All Y's of c have *OO accent when standing in isolation, but as we have seen, not all *OO words belong to c. For example in a there are *kai 'seashell', *nada 'opensea', *uri 'gourd' etc. I have found only *OO Sino-Japanese morphemes in b (eg. *kyuu 'level'). There are OO and O*O native morphemes in b (eg. saki 'destination', mura* 'village'). That *OO native morphemes do not appear in b suggests the distribution in (3), but this of course demands an explanation, which shall be forthcoming in section 3.

(3)

accent of Y	unmarked compound accent	marked compound accent
OO	—*+OO	—+OO
*OO	—*+OO	—*+OO[4]
O*O	—*+OO	—+OO

2.2. Long compounds — X+Y where X is 1 or more moras and Y is 3 or more moras.

The resulting accent is decided by Y. In long compounds, unaccented and last-accented Y's take the accent on the first mora (of Y), and other accent types preserve their accent.[5] Eg.

(4)

yamazakura 'wild cherry blossoms' (sakura 'cherry blossom')

isiatama 'stubborn person' (atama 'head')

yonakiguisu 'nightingale' (guisu 'bush warbler')

hanayomesugata 'in bridal dress' (sugata 'appearance')

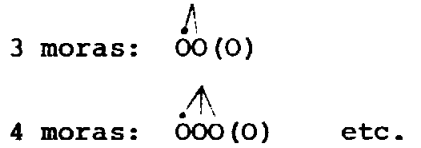
3. The analysis.

There are points in common between these two types of compounds. Accent is decided by Y in each case, and accent on the final mora cannot survive. The basic difference is that in long compounds the accent is assigned to the last element (Y), and in short compounds the accent is assigned either to the first element (unmarked) or no accent is assigned (marked). These differences have until now prohibited the formulation of a single rule for the assignment of accent to both classes of compounds, differing only in the number of moras in X and Y. This difference (between less than three and three or more) must be explained.

We are now in a position to consider rules. That the final mora of X+Y loses its accent suggests that the last mora is extrametrical. Long compounds accent the first mora of Y, which

gives well to the construction of a left dominant unbounded tree. The final mora, being extrametrical, does not belong to the tree, giving us the key to the difference between Y's of less than 3 moras, and those of 3 or more moras.

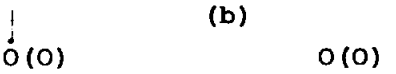
(5)



However, what would an unbounded tree look like on morphemes of 1 or 2 moras?

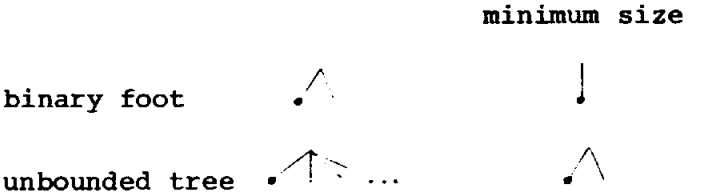
(6) 1 mora: (O)

2 moras: (a) (b)



The data suggest that (b) is the correct analysis, something which would follow if it is assumed that the minimum unbounded tree must contain 2 or more moras (or syllables in syllable counting languages). Adding this to the observations of Hayes (1980), Halle and Clements (1983) and others, we obtain the following tree shapes (only left headed trees are given).

(7)



This much is expected to be universal, and should eventually fall out from a well articulated metrical theory.

In long compounds, the accent always falls on Y, as an unbounded tree can be constructed on Y, but with short compounds Y is too small to carry an unbounded tree. How can short compounds be accented then? One possibility is to leave the compound as is, and the result is the marked version of (3). The only other possibility is to assign an accent to somewhere on X, and this is the unmarked version of (3).

As language specific rules, the following are required.

(8) (i) make extrametrical word-final mora
(ii) construct a left-headed unbounded tree over last element (Y)
(iii) other rules (accent last mora of X in certain cases, etc.)
(iv) erase all accents but last one

It should be noted that rules (i), (ii) and (iii) apply only in compounds, showing that these are lexical rules, and also cyclic rules. For example, rule (i) must be cyclic to prevent it from applying to underived words (such as atamā*, which surfaces as finally accented). It can therefore be concluded that the level of the lexicon where compounding takes place is a cyclic stratum, and so all rules which apply there are subject to the strict cyclicity condition.

Rule (iv) must apply no later than the last lexical stratum, but at present I have no evidence bearing on its exact position in the lexicon.

4. A postlexical parallel.

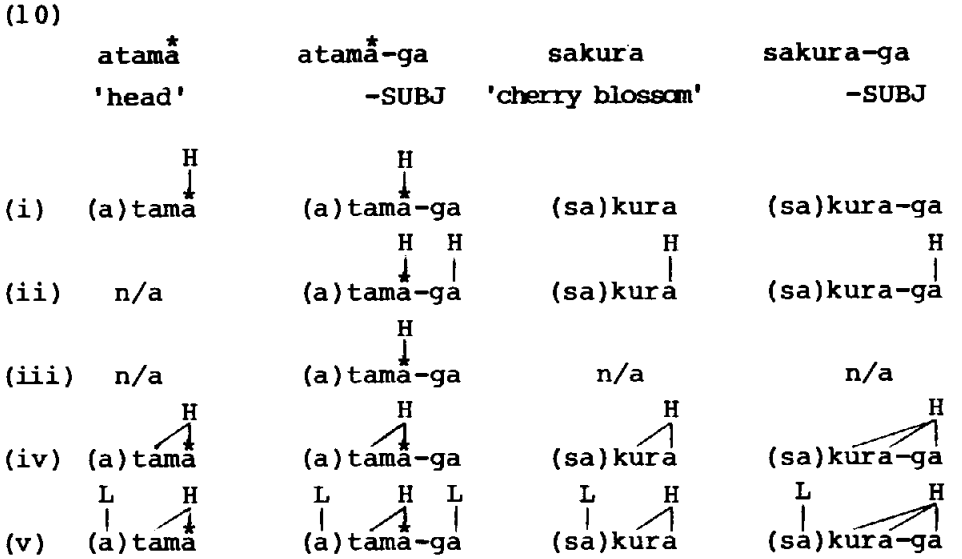
Archangeli and Pulleyblank (n.d.) (hereafter A&P), dealing with a portion of the phonology of Japanese, propose the following rules for the actuation of underlying tones (my underlying accents).

(9) (i) make extrametrical word initial mora[6]
(ii) assign tone to last mora
(iii) erase all tones but first one
(iv) left H-tone spread
(v) default L-tone assignment

All of these rules apply postlexically because they apply to noun-clitic sequences (A&P: 10). Examples of their application are given in (10).

It will be noticed that A&P's rule (i) is the exact mirror image of my rule (i). If the difference between accent (under-

(10)



lying) and tone is ignored, and if unbounded trees are not built across boundaries (by universal convention?), then A&P's rules (ii) and (iii) become the mirror images of my rules (ii) and (iv). It would be unreasonable to take it as a coincidence that so many rules change direction of application when their domain of application changes. I suggest that the different directionality might follow from universal principles which ammount to accent rules applying in the lexicon (or perhaps only at certain strata in the lexicon) working from the right, and those applying postlexically, working from the left.

5. Summary.

I have presented an analysis which derives the long/short distinction from extrametricality and an assumed minimum size of unbounded feet. I have also adduced supporting evidence from an analysis of a completely different kind, the postlexical realisation of accent, where, except for the direction of application, several of the rules which have been independently proposed are identical to those required by my analysis. Short of the ad hoc stipulation of the difference between long and

short elements, I can think of no other way to account for the data. But that does not mean that there cannot be any other way. As Shosuke Haraguchi has pointed out to me (personal communication), I need independent evidence pointing to the existence of metrical trees in Japanese.

— Devoicing and Accent Shift —

To my knowledge, the exact conditions for vowel devoicing and resulting accent shift in Japanese have never been studied in detail, and there are many problems which require investigation. For the examples which I give below however, "high vowels (i and u) devoice between voiceless consonants" is an accurate enough formulation. I represent the voiceless vowels as i̥ and u̥, and all data in the following sections, unless otherwise stipulated, are taken from Kindaichi (1981) and Hirayama (1960).

6. A successful treatment of part of the phenomenon.

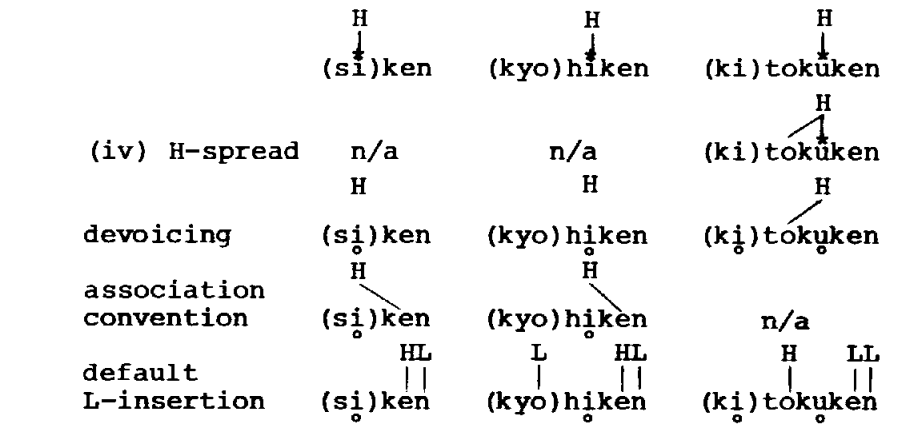
Data representative of the phenomenon to be accounted for are given in (11).

(11)

accent on	underlying	surface
1st mora	*siken 'examination'	siken
2nd mora	kyohi*ken 'veto'	kyohiken, kyohiken[7]
3rd mora	kitoku*ken 'vested rights'	kitokuken, kitokuken
4th mora	akiresu*ken 'achilles tendon'	akiresuken, akiresuken
5th mora	munooryoku*sya 'incompetent person'	munooryokusya, munooryokusya

The generalisation which appears to be able to be made is that when accent bearing units are no longer able to bear an accent, accents on the first and second moras move to the right, but accents further than 2 moras from the beginning of a word move to the left. A&P (29-32) present an autosegmental analysis of Japanese accent shift which requires no special rules (12).

(12)



In view of the simplicity and elegance of the above autosegmental account, I shall not outline a metrical account of the above Japanese phenomenon, but refer the reader to Prince 1983 (93-5) for a comparison of the two treatments.

7. More shifts in Japanese.

There are cases where, even though the devoiced accent bearing vowel is more than 2 moras from the beginning of a word, the accent is shifted rightward. Although such examples are to be found in accent dictionaries, they have not, as far as I am aware, been recognised as a problem.

7.1. The previous analysis.

Kindaichi (1981: appendix p. 5) gives the following examples:

(13) iryookikai, iryookikai 'medical instruments'
kantootihoo, kantootihoo 'Kanto district'

with the explanation that kikai 'instrument' is accented as kikai, and this form undergoes normal compouding rules (section 3) to become iryookikai. But on the other hand, kikai is derived from kikai, and when this form undergoes the compounding rules, the resulting form is iryookikai. The same explanation carries over to kantootihoo with tihoo 'district' from tihoo.

This account has several drawbacks. First, it requires the following derivation:

(14)		iryookikai	iryookikai
		*kikai	*kikai
devoicing		*kikai	*kikai
accent shift	(some speakers)	kikai	kikai
compounding		iryoo+kikai	iryoo+kikai

but although the attested compound forms are successfully derived, the unattested form *kikai is also derived. A filter ruling out word-initial accented devoiced vowels becomes necessary. The most serious drawback, however, is that because devoicing occurs before compounding, accent must sometimes be assigned to a voiceless segment, even though there is a voiced vowel in the proximity. For example:

(15) yama+hutokoro, yama+hutokoro 'mountain recess'
toei+tikatetu 'metropolitan subway'
kanren+situmon, kanren+situmon 'related questions'
gyoosei+kukaku, gyoosei+kukaku 'administrative division'
minkan+hikoo, minkan+hikoo 'civilian flight'
ningyoo+tukai, ningyoo+tukai 'puppeteer'

In each of these examples, the second element (Y) of the compound is underlyingly unaccented, the accent on the compound being assigned by the compounding rules. There are two ways to derive these forms, but either way, an accent must be assigned to a voiceless vowel. If an analysis is available which does not require such an unnatural process, it should be given serious consideration.

7.2. A boundary analysis.

All of the examples which behave in this way are compounds, and the devoiced vowel is in the mora which immediately follows the compound boundary.[8] When the vowel is devoiced, normally the accent would be expected to shift to the left in accordance with the data and interpretation seen in section 6, but if it is assumed that the accent cannot cross a (compound) boundary, if it moved, it could only move to the right. This would give us the

derivation in (16).

(16)

	yama+hutokoro	
compounding	yama+hu̇tokoro	
devoicing (& shift)	yama+hu̥tokoro	yama+hu̥tokoro

The filter required in the above account is now no longer necessary as we can return to the account in section 6 where extrametricality forces accent shift. Because devoicing applies after compounding, there is no need to assign an accent to a voiceless unit. These are both welcome consequences, but the boundary analysis too has several problems. The first is that in kyohiken 'veto' (11), the accent moves to the right, even though kyohi̥ken is a compound kyohi+ken. One could, of course, allow the accent to cross a boundary in such cases as kyohiken by making the ad hoc stipulation that accents may cross boundaries only from left to right, and not from right to left, or that they may cross boundaries only if they cannot move elsewhere (because of extrametricality in this case).

A more serious problem is presented by the theory of lexical phonology. Lexical phonology is very restrictive in that boundaries may exist only at the level at which they are created by morphological operations (Mohanan 1982: 8; Kiparsky 1982: 11). Compound boundaries may thus be visible only at the level where compounding takes place. It is therefore necessary to consider devoicing and accent shift as taking place at the level of compounding, a lexical level. However the autosegmental treatment we saw in section 6 hinges crucially on accent shift applying postlexically, after rule (iv) in (9). There is also direct evidence that devoicing takes place at a postlexical level.

(17) eiga-no hi̥-to atte...[9]
movie-GEN day-being
'being movie-going day,'

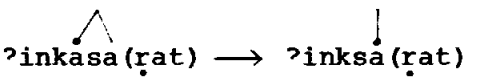
'Movie-going day' is in Japanese eiga-no hi, where no vowels are in the devoicing environment, but, when this phrase comes into contact with -to atte, i is devoiced. Hi-to being a noun-clitic

sequence, the devoicing rule in this case must be postlexical. In order to maintain the boundary analysis, it becomes necessary to have the devoicing rule apply twice, once at the same level as compounding and once postlexically.

8. The metrical analysis.

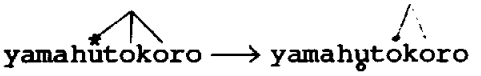
It has been observed (Al-Mozainy et al. 1985; Halle and Vergnaud as reported in Rappaport 1984: 64-6) that whether accent moves to the right or to the left in languages with arboreal metrical structure depends on whether the tree is left dominant or right dominant. The accent moves so as to remain in the same tree. An example from Bedouin Hijazi Arabic will serve to illustrate the point (example (12) of Al-Mozainy et al. 1985).

(18)



Yamahutokoro 'mountain recess' has the structure yama+hutoko(ro) at compounding, and enters the postlexical component as yamahutokoro.[10] The metrical structure, being still preserved postlexically, now allows a simple account of accent shift, exactly parallel to that seen in (18).

(19)



The devoicing rule need apply only once, postlexically, and accent shift applies with it.

9. Implications

The metrical analysis is thus once again shown to be necessary. But there still remains the fact that the autosegmental treatment does an excellent job where I have not motivated an arboreal structure. I am of the opinion that both a metrical analysis and an autosegmental analysis are necessary for an adequate account of Japanese tonal phonology — the metrical analysis is necessary for accent assignment, a deep process,

and the autosegmental analysis for the tonal realisation of accent, a postlexical process. Both sets of structures co-exist postlexically, as shown by the accent shift phenomenon discussed above.

NOTES

[1] The first part, sections 1-5, is a much revised and shortened version of a term paper written in August 1984 which benefited greatly from suggestions by professor Minoru Yasui, Shōsuke Haraguchi and Kōji Ono. The second part, sections 6-9, was conceived in late May, 1985. I take this opportunity to thank Shōichi Tanaka and Satoshi Ōta who, in spite of being very busy, most willingly read a draft of the whole paper and offered invaluable comments. I alone am responsible for all remaining inadequacies.

[2] O represents one mora; * is an underlying accent. ¬ is the position of the last high tone before a low tone — the surface realisation of *.

[3] This is given support by Kindaichi 1981 (appendix p. 18) which gives b as a "special group".

[4] Further evidence that ——Ó*O and ——OO are in complementary distribution is provided by the behaviour of the word huro 'bath' in compounds. Huro has two pronunciations, hurǒ* and hǔ*ro, the latter being the newer pronunciation.

	hurǒ*	hǔ*ro	
compounds:	goemonburo	goemonbǔ*ro	'a kind of bath'
	teppooburo	teppoobǔ*ro	'a kind of bath'

If ——OO and ——Ó*O compounds are taken to be the same marked accent class as in (3), and the presence of the accent on the penultimate mora is due to its presence in the original Y, then it is necessary only to assume that huro belongs to the marked compound accent class. If ——OO and ——Ó*O were not in the same class, it would become necessary to assume that when the accent on huro moved, its compound accent class changed too.

[5] There is one systematic exception to this pattern. Underived Y's of the form O$\overset{*}{O}$O usually take the compound accent on the first mora of Y (Higurashi 1983: 64, 73), although there is some variation. Eg.

kok$\overset{*}{o}$ro 'heart, soul'	musumego$\overset{*}{k}$oro 'girlish sentiment'
tam$\overset{*}{a}$go 'egg'	yudetam$\overset{*}{a}$go, yudet$\overset{*}{a}$mago 'boiled egg'
	namatam$\overset{*}{a}$go, namat$\overset{*}{a}$mago 'raw egg'
ut$\overset{*}{i}$wa 'fan'	hidariut$\overset{*}{i}$wa, hidariut$\overset{*}{i}$wa 'in comfort'
	gunbaiut$\overset{*}{i}$wa, gunbaiut$\overset{*}{i}$wa 'umpire's fan'

(data from Kindaichi 1981)

This is no doubt related to the fact that there is variation in the accent of these Y's when standing alone. The following table gives the forms included in 2 accent dictionaries and those elicited from 4 informants.

Hirayama 1960 Kindaichi 1981	kok$\overset{*}{o}$ro, [kokoro$\overset{*}{]}$	tam$\overset{*}{a}$go, [tamago]	ut$\overset{*}{i}$wa
Masanori Tsutsumi (male, age: 23)	kokoro$\overset{*}{]}$, (kok$\overset{*}{o}$ro)	tam$\overset{*}{a}$go, (tamago)	ut$\overset{*}{i}$wa
Hiroyuki Nishizawa (male, age: 27)	kok$\overset{*}{o}$ro	tam$\overset{*}{a}$go, tamago	ut$\overset{*}{i}$wa, uti$\overset{*}{w}$a
Mieko Oguro (female, age: 31)	kokoro$\overset{*}{]}$	tam$\overset{*}{a}$go, (tamago)	ut$\overset{*}{i}$wa
Atsuko Lawrence (female, age: 29)	kokoro$\overset{*}{]}$, (kok$\overset{*}{o}$ro)	tam$\overset{*}{a}$go, tamago	ut$\overset{*}{i}$wa

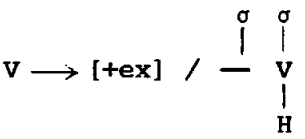
(The two female informants are sisters)
(The forms in square brackets are not listed in Hirayama 1960, but are in Kindaichi 1981 as regional variants)
(The forms in parentheses are forms which the informant himself does not use, but which would pass unnoticed if heard)

This variation is in turn probably related to the fact that in some Western Japanese dialects, O$\overset{*}{O}$O underived nouns (in the framework of Haraguchi 1977, underived nouns of the form O$\overset{*}{O}$O with the HL melody) have disappeared, or are unstable and on the verge of disappearing. For example, in the Kyoto dialect of Hirayama 1960, I have found only one underived O$\overset{*}{O}$O word, o$\overset{*}{n}$na 'woman', all others having changed to other accent groups.

The reason for the instability of underlying items of this

form is unknown to me, but occurring independently in geographically separated dialects, it is obviously a phenomenon requiring a principled explanation.

[6] A&P (p. 13) actually formulate rule (i) as



This differs from the formulation I have given in several ways. Firstly, it makes extrametrical the word-initial mora only if it is not in a branching syllable. Secondly, it applies after rule (iv) (hence the H-tone on the following heterosyllabic vowel), thus preventing the rule from applying to initially accented words. Taking the second point first, there are two ways to get round it keeping 9(i). One is to assume that left extrametricality, as opposed to right extrametricality, by convention does not apply when there is an accent on the first unit (syllable, mora...). The other way is to assume that extrametricality does apply, but that, by convention, left extrametricality does not erase accents. The evidence, I believe, is slightly in favour of the latter way. This provides an explanation for the lack of s̄i̯ken (11), k̄i̯kai, t̄i̯hoo (section 7.1). No such explanation is forthcoming with A&P's rule above. As for the question of whether a branching syllable with an accented mora becomes extrametrical or not, all accent dictionaries give the first mora as being on a different pitch from the second, even in branching syllables, and this seems to be accurate for most speakers in careful speech.

[7] For many words where the accent-bearing vowel is devoiced, there are two possible pronunciations included in the dictionaries — one where the accent remains on the voiceless vowel, and one where it moves. Phonetically, the cue for an accented vowel is usually a falling pitch on the following vowel (or in some cases, when there is no falling pitch on the vowel following the accented vowel, the following vowel is lower than the accent bearing vowel by (at least?) approximately 24%) (Sugitō 1969).

It is therefore possible to distinguish between ...CV̥CV... and ...V̥CV̥CV..., contrary to what Prince (1983: 94) says.

[8] An apparent exception to this is zyuunisityoo 'duodenum' (zyuunisi̥tyoo, zyuunisi̥tyo̥o). This is historically zyuunisi '12 fingers' + tyoo 'intestines', but the direction of accent shift suggests that it has been reanalysed as zyuuni '12' + sityoo '? - intestine'.

[9] This phrase was heard used, with a devoiced i, by a television news announcer, and I checked for devoicing with three informants. They all gave the following pronunciations.

(i) eiga-no hi̥-to atte... (devoiced i)
(ii) eiga-no hi. (voiced i)

[10] Right extrametricality must be erased, by general convention or by rule, before postlexical rules apply in order to allow the correct derivation of unaccented compounds. If it were not erased, the word final mora of unaccented compounds would incorrectly surface with a default low tone.

REFERENCES

Al-Mozainy, H. Q., R. Bley-Vroman, and J. J. McCarthy. 1985. "Stress shift and metrical structure," Linguistic Inquiry 16:1. 135-44.

Archangeli, D. and D. Pulleyblank. n.d. "Extratonality and Japanese accent," unpublished manuscript, MIT.

Halle, M. and G. N. Clements. 1983. Problem book in phonology. Cambridge, Mass.: MIT Press.

Haraguchi, S. 1977. The tone pattern of Japanese: An autosegmental theory of tonology. Tokyo: Kaitakusha.

Hayes, B. 1980. A metrical theory of stress rules. Ph.D. dissertation, MIT.

Higurashi, Y. 1983. The accent of extended word structures in Tokyo Standard Japanese. Tokyo: EDUCA Inc.

Hirayama, T. 1960. Zenkoku akusento jiten [All-Japan accent

dictionary]. Tokyo: Tookyoodoo.

Kindaichi, H. 1981. Meikai Nihongo akusento jiten [Meikai Japanese accent dictionary]. 2nd edn. Tokyo: Sanseidoo.

Kiparsky, P. 1982. "Lexical morphology and phonology," in Linguistic Society of Korea (ed) Linguistics in the Morning Calm. 3-91. Seoul: Hanshin.

Leben, W. 1982. "Metrical or autosegmental," in H. van der Hulst and N. Smith (eds) The Structure of Phonological Representations. 177-90. Dordrecht: Foris Publications.

McCawley, J. D. 1968. The phonological component of a grammar of Japanese. The Hague: Mouton.

Mohanan, K. P. 1982. Lexical Phonology. Bloomington: Indiana University Linguistics Club.

Prince, A. S. 1983. "Relating to the grid," Linguistic Inquiry 14:1. 19-100.

Rappaport, M. 1984. Issues in the phonology of Tiberian Hebrew. Ph.D. dissertation, MIT.

Sugitō, M. 1969. "Dootaisokutei-ni yoru Nihongo-akusento-no kaimei" [A theory of pitch accent in Japanese according to the tone movement of vowels]. Gengo Kenkyuu 55: 14-39

Tateishi, K. 1984. "Nihongo Tookyoo-hoogen fukugoomeishi-no akusento" [Tokyo Japanese compound noun accentuation]. Paper read at the 89th general meeting of the Linguistic Society of Japan.

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