In Noriko Akatsuka, Hajime Hoji, Shoichi Iwasaki, Sung-Ock Sohn, and Susan Strauss, eds. (1998), *Japanese/Korean Linguistics 7*. Stanford: CSLI, 611-627.
Page breaks here are slightly different from those in the published version.

Noun Faithfulness: Evidence from Accent in Japanese Dialects

JENNIFER L. SMITH
University of Massachusetts, Amherst

1. Introduction[1]

When the phonological patterning of accentedness and accent location is examined across dialects of Japanese, three types of behavior are found. In some cases, no words, of any syntactic category, are permitted to have a phonological contrast with respect to a particular accent-related structure. In other cases, words of all (lexical) categories have the accent-related contrast in question. Finally, there are cases where nouns, and only nouns, are permitted to contrast with respect to accent. A fourth logical possibility is *not* found: a dialect in which words of a certain category are permitted to show an accent-related phonological contrast, but nouns are not.

To account for this typology of accent-related behavior, I make the following proposal (in the framework of Optimality Theory; see section 2.2): In addition to markedness constraints and general faithfulness constraints, the grammar also contains faithfulness constraints that are specific to nouns. The constraint set therefore allows exactly three classes of grammars to be generated. In grammars where accent-related markedness constraints are highest ranked, no accent-related phonological contrast is

[1] I am grateful to John Alderete, Jill Beckman, Laura Benua, Katy Carlson, Caroline Jones, Kiyomi Kusumoto, John McCarthy, Rachel Walker, and the members of the UMass Phonology Reading Group for helpful discussion related to the topics considered here, and to Teruhiro Hayata for first introducing me to the variety of accent patterns to be found in Japanese dialects. This research was supported by the National Science Foundation under grant SBR-9420424 and by an NSF Graduate Research Fellowship.

possible in words of any category. Where the markedness constraints are ranked lower than the general faithfulness constraints, then all categories are able to show the relevant phonological contrasts.

The third logical possibility is to rank the markedness constraints higher than the general faithfulness constraints but lower than the noun-specific faithfulness constraints. As is discussed in detail in section 3, this is the class of grammars that permit nouns to show phonological contrasts that are prohibited from verbs and adjectives.

Crucially, given a constraint set that contains markedness, (general) faithfulness, and noun-faithfulness constraints, there is no way to generate a grammar that permits verbs or adjectives to show more phonological contrasts than nouns can show. Regardless of how the constraints are ranked, the only grammars that this analysis can produce are those that are actually attested in the dialects of Japanese.

The paper is structured as follows. Section 2 introduces the nature and representation of Japanese accent and gives a brief overview of the theoretical framework of Optimality Theory. Section 3 develops the idea of noun faithfulness, presenting evidence from accent behavior in a number of Japanese dialects. Finally, broader issues and general conclusions are examined in section 4. In particular, this section proposes that the division between nouns and words of other categories in Japanese is a subcase of a more general division between free forms and bound forms.

2. Background and theoretical framework

2.1 Accent in Japanese

In most dialects of Japanese, pitch is distinctive.[2] Many dialects have minimal pairs of words differing only in pitch contour. Nevertheless, in order to determine the tonal contour of a word, it is necessary to know only the location (or absence) of the *accent*, which is the locus of an abrupt change in pitch, and the default tonal pattern assigned to the remaining syllables in the particular dialect in question.[3] Japanese dialects are therefore generally considered to be pitch-accent systems. Typically, the surface realization of accent in a given dialect is a high tone followed by a fall in pitch.

Most analyses of Japanese accent fall into one of two groups. Some researchers treat lexical accent as a *diacritic* on a vowel, mora, or syllable in the lexical entry of a word (e.g., Hattori 1951, McCawley 1968, Haraguchi 1977). Other analyses represent lexical accent as a *tone* or a *sequence of tones* that is associated with a vowel, mora, or syllable (e.g., Poser 1984 and references therein, Pierrehumbert & Beckman 1988).

---

[2] For some dialects, such as Miyakonojô, the pitch contour of a phrase is completely predictable. This phenomenon is shown below to be the result of a high-ranking markedness constraint.

[3] In dialects with more than one lexical melody or "word tone", such as the Kyôto-type dialects, it is necessary to specify the melodic or tone class to which a word belongs as well as the location of its accent. Pierrehumbert and Beckman (1988) account for the word tone as an initial H or L tone associated lexically with each word; word tone and accent are distinct phenomena.

This paper is concerned with the behavior of accent, not with the nature of its lexical representation. For notational convenience, I have therefore chosen to represent accent as a diacritic, but this choice is not intended to imply any substantive claims about the nature of accent.[4]

2.2 Optimality Theory

This analysis assumes the framework of Optimality Theory (OT), as developed in Prince & Smolensky (1993), McCarthy & Prince (1995), and other recent work. In this framework, the grammar of a particular language consists of a universal *set of violable constraints* and a language-particular *ranking* of these constraints. For every input (underlying) form, a set of candidate output forms is generated. The one candidate that best satisfies the conflicting demands of the constraints in the hierarchy is chosen as the *optimal* form, that is, the attested output form.

Constraints fall, generally speaking, into two classes. *Faithfulness* constraints (**F**) require that the output be the same as the input; examples are constraints such as DEP 'No epenthesis', or MAX_{ROOT} 'No deletion from roots'. *Markedness* constraints (**M**) require that the output avoid certain structures; examples include *ACCENT 'No accents', or *LARYNGEAL 'No laryngeal features'.

One of the advantages of OT as a theory of phonology is that constraint interaction, the very same mechanism that accounts for phenomena such as allophonic alternation, is also what accounts for matters of language inventory and typology. In particular, OT holds that there are no language-particular restrictions on what kinds of phonological structures can appear in underlying forms, a principle termed *richness of the base* by Prince & Smolensky (1993). When a language prohibits a particular structure from appearing in its surface forms, this is not the result of restrictions on morphemes in the lexicon. Rather, it is a consequence of the particular constraint ranking of that language.

Consider a markedness constraint **M** that says "Output forms must not have structure ϕ", and a faithfulness constraint **F** that says "If an input has ϕ, its corresponding output must have ϕ". Obviously, these two constraints conflict. In a language where **M** dominates **F**, then ϕ will never appear in any output form; all morphemes are [-ϕ], so there is no phonological contrast for ϕ in the language. However, in a language where **F** dominates **M**, then morphemes that have ϕ in their input forms will surface as [+ϕ], while those that do not will surface as [-ϕ]; this

[4] The distinction between accent as diacritic and accent as tone may be less significant than was once thought. Pierrehumbert and Beckman (1988) present evidence that the tonal contour of a word or phrase in Japanese does not come from spreading the tones of the accent to other syllables, as was assumed in much autosegmental work on Japanese. Instead, the surface pitch contour is produced by phonetic interpolation between tone targets, including not only the nonspreading accent, but also tones associated with higher levels of prosodic structure. Given this analysis, it becomes impossible to distinguish between the diacritic and prelinked-tone theories of accent with respect to how the surface pitch contour is determined, as Pierrehumbert and Beckman note (1988:122).

language does have a phonological contrast for ϕ.

In other words, the absence of a phonological contrast implies that the relevant markedness constraint dominates the relevant faithfulness constraint, whereas the presence of a phonological contrast implies that faithfulness outranks markedness. Turning now to the analysis of the accent-behavior typology in Japanese dialects, we see concrete examples of this kind of ranking argument, as well as more illustration of the concept of richness of the base and its implications for the content of underlying representations.

3. Noun faithfulness and the typology of accent phenomena

As outlined above, the dialects of Japanese fall into three types with respect to accent-related behavior:

• No-Contrast: No categories have a phonological contrast with respect to accent
• All-Contrast: All (lexical) categories are permitted to contrast with respect to accent
• Noun-Contrast: Nouns are permitted to contrast for accent; other categories are not

The analysis developed in this section is able not only to account for each of these three types but also to predict correctly that there are no other types.

The blanket term "accent-related behavior" here refers to two distinct phenomena: *accentedness*, the question of whether there is a phonological contrast between accented and unaccented words; and *accent location*, the question of whether the location of the accent in a word (or phrase) is contrastive or predictable.[5] These two properties are independent, so it is possible for a given dialect to show (e.g.) All-Contrast behavior with respect to accentedness while showing (e.g.) No-Contrast behavior with respect to accent location.

3.1 No-Contrast behavior

Some dialects simply do not permit any word, of any category, to have a particular phonological contrast. This subsection examines two such cases.

One example of No-Contrast behavior is accentedness in Miyakonojô, as described by Haraguchi (1977, following Hirayama 1943). In Miyakonojô, all phrases have the same tonal contour: a string of L tones with one final H tone.

(1)	a.	L H	L L H
		hana	hana-ga
		'flower' *or* 'nose'	'flower-NOM' *or* 'nose-NOM'

[5] Frellesvig (1994) refers to these two properties as 'commutative accent' and 'permutative accent' respectively.

b. L L H L L L H L L H L L L H
[Kyooto-se] [itta?ku?-d$_3$i] [genki-de] [o?kuiyai-na] (Careful speech)
'Kyoto-to will-go as, take care POLITE'
('As I will go to Kyoto, take care of yourself well.')

The surface tone pattern is sensitive only to prosodic structure; the lexical content of the phrases does not affect the pitch contour. Therefore, following Haraguchi (and others), I assume that words in Miyakonojô do not have accents (the predictable phrase-final high tone is probably a boundary tone). In OT terms, this state of affairs is the result of a markedness constraint, *ACCENT, which prohibits words from having accents.[6]

(3) **M**: *ACCENT Output forms do not have accents

In other dialects, there are words with accents, so we know that the grammar contains a faithfulness constraint requiring preservation of input accents:

(4) **F**: MAX(ACCENT) An accent in the input must have a correspondent in the output ('No deletion of accents')

*ACCENT and MAX(ACCENT) are, of course, in conflict. Which of the two constraints is active in a given dialect is determined by their relative rank in the grammar of that dialect. The ranking *ACCENT >> MAX(ACCENT) gives the pattern observed in Miyakonojô. Under this ranking, whether the input contains an accent or not, high-ranking *ACCENT ensures that the optimal output candidate has no accent. Tableaux (i)-(iii) in (5) demonstrate this instance of the principle of richness of the base.

(5) *hana* 'flower' (Miyakonojô)

(i) /hana/	*ACCENT >> MAX(ACCENT)	
a. haná	*!	
b. ☞ hana		

[6] Similar markedness constraints that ban structure, for example *SYLLABLE (Prince & Smolensky 1993), have been motivated in the literature.

(ii) /hanáː/	*ACCENT >> MAX(ACCENT)	
a. hanáː	*!	
b. ☞ hana		*

(iii) /háːna/	*ACCENT >> MAX(ACCENT)	
a. háːna	*!	
b. ☞ hana		*

KEY for tableaux		X >> Y	X dominates Y
/.../	input	X, Y	X and Y are unranked
a, b,...	candidates	*	constraint violation
☞	optimal candidate	*!	fatal violation

That is, it is the constraint hierarchy itself that ensures that no output forms have accents in Miyakonojô. Stipulating that input forms must not have accents serves no purpose; even input forms that do have accents (5ii, iii) give rise to the correct, unaccented forms.[7]

The lack of contrastive accentedness in Miyakonojô demonstrates the general result that when a markedness constraint is ranked above conflicting faithfulness constraints, the language will not have a phonological contrast for the structure in question.

Another example of No-Contrast behavior is the case of accent location in Kagoshima (data from Haraguchi 1977, after Hirayama 1960 and others). Unlike Miyakonojô, words in Kagoshima do contrast for accentedness, so there are words with and without accents.[8] However, there is no contrast in accent location. The accent

[7] From the point of view of learnability, one can argue (very plausibly) that a Miyakonojô learner has no reason to think that any of the input forms in the lexicon do have accents, since no accents appear in any output forms. Therefore, the lexicon of an actual Miyakonojô speaker probably contains only unaccented forms. "Richness of the base" does not mean that a speaker has no fixed (and reasonable) input forms in his or her lexicon. What it actually means is that the theory can handle even putative inputs that do contain accents without resorting to any stipulations about the contents of the lexicon.

[8] Kagoshima shows two different surface pitch patterns, $(L)^0HL$ and $(L)^0H$. One characterization of this dialect (e.g., Shibatani 1990) is that these pitch contours belong to accented and unaccented words respectively. An alternative analysis (e.g., Hayata 1977) is that there are no accented words, but words fall into one of two distinct melody classes (perhaps LHL and LH). With the two-melody analysis, one must derive the surface patterns by assuming that word-melodies link and spread. Since Pierrehumbert

always falls on the penultimate syllable of the minor phrase.

(6)a.	hána	'nose'	a'.	hanágа	'nose-NOM'
b.	sakúra	'cherry'	b'.	sakurágа	'cherry-NOM'
c.	kagaríbi	'watch-fire'	c'.	kagaribígа	'watch-fire-NOM'

The markedness constraint responsible for penultimate accent can be represented as follows:[9]

(7) **M**: PENULTACCENT If there is an accent, it is penultimate

Again, this markedness constraint is in conflict with a faithfulness constraint:

(8) **F**: FAITHLOC(ACCENT) Output accent is faithful to its location in the input

In Kagoshima, there is no contrast with respect to accent location. As in the Miyakonojô example above, the lack of contrast is the result of markedness outranking faithfulness: PENULTACCENT dominates FAITHLOC(ACCENT). With this ranking, no matter where the accent is located in the input, the output always has penultimate accent. (Again, the principle of richness of the base can be seen at work. The input accent in (9) is placed arbitrarily on the initial syllable; see footnote 7.)

(9) *sakúra* 'cherry' (Kagoshima)

/sákura/	PENULTACCENT >> FAITHLOC(ACCENT)	
a. sákura	*!	
b. ☞ sakúra		*

The cases of accent location in Kagoshima and accentedness in Miyakonojô thus illustrate the same generalization, schematized in (10).

---

and Beckman (1988) demonstrate that the linking and spreading of word-level melodies is not the best analysis for surface tone patterns in Tôkyô, I tentatively assume that it is not the appropriate analysis for other dialects either. Therefore, I choose the first option, taking the relevant distinction in Kagoshima to be between accented and unaccented words.

[9] This "constraint" is an abbreviation made for the sake of clarity of exposition. It encapsulates an interaction between two more general constraints: ALIGN-RIGHT(ACCENT, PPH), which requires every accent to be at the right edge of some phonological phrase, is dominated by NONFINAL(ACCENT), which prohibits accent from falling on the final syllable. As a result, the accent is as far to the right as possible without being final: it is on the penultimate syllable.

(10) Ranking: **M** >> **F**
Result: No categories have the relevant phonological contrast

Whenever a markedness constraint banning a certain structure outranks any faithfulness constraints that would require the structure to be maintained, the structure is absent from the language. In such a language, there is of course no phonological contrast with respect to the structure in question.

3.2 All-Contrast behavior

The second pattern of accent behavior found among Japanese dialects is the All-Contrast type, in which words of any (lexical) category are permitted to have a particular phonological contrast. Dialects with this pattern include Hirosaki (Haraguchi 1977, after Konoshima 1961) and Tôkyô (McCawley 1968, Poser 1984), both with respect to accentedness. In these dialects, a given word of any category may be accented or unaccented.

(11)

a.	Hirosaki:	ame	'candy'	b.	Tôkyô:	mor-u	'pile(s)'
		amé	'rain'			mór-u	'leak(s)'

As seen in section 3.1, there is no contrastive accentedness in Miyakonojô because the markedness constraint *ACCENT dominates the faithfulness constraint MAX(ACCENT). The Tôkyô/Hirosaki pattern, where accentedness is contrastive, comes from the opposite ranking of the same two constraints: in these two dialects, MAX(ACCENT) dominates *ACCENT. Therefore, the optimal candidate is one that preserves an accent found in the input rather than one which deletes it to satisfy the markedness constraint.

(12) *amé* 'rain' (Hirosaki)

/amé/	MAX(ACCENT)	>>	*ACCENT
a. ☞ amé			*
b. ame	*!		

It is important to note that the Tôkyô/Hirosaki ranking of MAX(ACCENT) over *ACCENT does not force *all* output forms to have an accent. MAX(ACCENT) requires only that an accent *present in the input* have a correspondent in the output. If for a given word the input has no accent, then the optimal output for that word will not have an accent.

(13) *ame* 'candy' (Hirosaki, Tôkyô)

/ame/	MAX(ACCENT) >> *ACCENT	
a. amé		*!
b. ☞ ame		

The above discussion demonstrates that in Tôkyô and Hirosaki, MAX(ACCENT) dominates *ACCENT. As a result, any word may have an accent. The case of accentedness in these two dialects is an example of the general pattern in (14).

(14) Ranking: **F** >> **M**
Result: All categories have the relevant phonological contrast

Whenever a faithfulness constraint outranks a conflicting markedness constraint, the optimal output is one that stays faithful to the input form, rather than one that gratuitously eliminates the structure banned by the markedness constraint. Inputs with the relevant structure correspond to outputs that have it as well; inputs without the structure correspond to outputs that do not have it. Thus, there is a phonological contrast in the language for the structure in question.

3.3 Noun-Contrast behavior

The two types of accent behavior just discussed have a common characteristic: words of all lexical categories behave the same with respect to the phonological contrast under consideration. In No-Contrast phenomena, no categories have the contrast, and in All-Contrast phenomena, all categories have the contrast. The third type of grammar observed among the dialects of Japanese is the Noun-Contrast type, in which nouns are permitted to have a certain phonological contrast but words of other categories (specifically, verbs and adjectives) are not.

A well-known example of Noun-Contrast behavior is the case of accent location in Tôkyô (McCawley 1968, Poser 1984). While accent location is distinctive for (accented) nouns in this dialect, it is not distinctive for (accented) verbs or adjectives.

(15) a. Nouns: accent location unpredictable (Haraguchi 1977)
(i) ínoti 'life'
(ii) kokóro 'heart'
(iii) atamá 'head'

b. Verbs: accent location predictable (Most data from Poser 1984)

(I)	kák-u	'write'	(iv)	dé-ru	'emerge'
(ii)	nayám-u	'worry'	(v)	kaké-ru	'hang'
(iii)	kumadór-u	'gradate'	(vi)	todomé-ru	'stop'

c. Adjectives: accent location predictable

(i)	takái 'high'	(iii)	omosirói 'interesting'
(ii)	surudói 'acute'	(iv)	urayamasíi 'enviable'

If we consider first only the verbs and adjectives, we see that their behavior resembles the No-Contrast case of Kagoshima, discussed in section 3.1. Once again, a lack of phonological contrast implies that markedness outranks faithfulness.

The markedness constraint in question for Tôkyô is one that fixes the accent in a particular location, abbreviated here as FIXLOC(ACCENT).[10] The faithfulness constraint that it dominates is FAITHLOC(ACCENT), introduced in the analysis of Kagoshima in section 3.1. As (16) shows, the higher rank of the markedness constraint ensures that no matter which syllable may bear the accent in the input, accent always appears in a fixed location in the output.

(16) *omosiróiA* 'interesting' (Tôkyô)

/omósiro-iA/	FIXLOC(ACCENT) >>	FAITHLOC(ACCENT)
a. omósiroi	*!	
b. ☞ omosirói		*

However, as observed in (15a), accented nouns in Tôkyô may have their accent on any syllable; accent location is contrastive for nouns. According to the discussion in section 3.2, the presence of a phonological contrast implies that faithfulness outranks markedness. However, we can not simply discard the ranking in (16) and say that the correct ranking for Tôkyô is FAITHLOC(ACCENT) >> FIXLOC(ACCENT); while such a ranking would correctly give us contrastive accent location for nouns, it would also, incorrectly, give us a contrast for verbs and adjectives as well.

This apparent paradox can be resolved by including in the grammar a new family of faithfulness constraints: domain-specific faithfulness constraints that apply only to nouns, or *noun-faithfulness constraints*. For example, adding the following noun-faithfulness constraint to the hierarchy so that it dominates the markedness constraint FIXLOC(ACCENT) produces the correct results for the case of accent location in Tôkyô.

(17) **NF**: FAITHLOC$_N$(ACC) Output accent is faithful to its input location, *in nouns*

With this hierarchy, for nouns the winning candidate is the one that preserves the input

[10] The precise location of the accent often depends on the inflectional form, as in Tôkyô *kakéru* 'hang', *káketa* 'hung'; *takái* 'is high', *tákakatta* ~ *takákatta* 'was high'. Therefore, the constraint name FIXLOC(ACCENT) is used here to encapsulate several simpler constraints that interact to determine the accent location for a given verbal or adjectival inflection.

accent location, satisfying the high-ranking noun-faithfulness constraint.

(18) *atamá*$_N$ 'head' (Tôkyô)

/atamá$_N$/	FAITHLOC$_N$(ACC) >>	FIXLOC(ACC) >>	FAITHLOC(ACC)
a. ☞ atamá		*	
b. atáma	*!		*

This revised constraint ranking is still able to choose the correct output form for verbs and adjectives. Since these words are not nouns, they are not subject to noun-faithfulness constraints such as FAITHLOC$_N$(ACCENT), so it is the markedness constraint FIXLOC(ACCENT) that determines the winning candidate. As a result, verbs and adjectives do not have phonologically contrastive accent location.

(19) *omosirói*$_A$ 'interesting' (Tôkyô)

/omósiro-i$_A$/	FAITHLOC$_N$(ACC) >>	FIXLOC(ACC) >>	FAITHLOC(ACC)
a. omósiroi		*!	
b. ☞ omosirói			*

The idea that there are faithfulness constraints applicable only to nouns is not without precedent. There are a number of phonological phenomena, known as positional neutralization effects (Steriade 1993), in which certain contrasts are permitted only in "salient" positions. In order to account for such phenomena, a number of proposals have made use of *domain-specific* faithfulness constraints. The domains for which specific faithfulness constraints have been proposed include phonologically or phonetically salient domains, such as the stressed syllable (Alderete 1995, Beckman 1996), the syllable onset (Lombardi 1996), and consonants which are [+release] (Lombardi 1996, Padgett 1995); also included are gramatically salient domains such as the morphological root (*vs.* affixes) (McCarthy & Prince 1995) and the root-initial syllable (Beckman 1995, 1996). In proposing that noun-faithfulness constraints are part of the grammar, I thereby imply that the category *noun* is more salient in some way than other syntactic categories are. This issue is taken up in Section 4 below.

A second example of Noun-Contrast type accent behavior is the case of contrastive accentedness in Hakata (Hayata 1985). In this dialect, nouns may be accented or unaccented. However, verbs and adjectives must be accented.

The markedness constraint responsible for enforcing accentedness in verbs and adjectives can be formulated as follows:

(20) **M**: HAVEACCENT An output form has an accent

Note that this markedness constraint (which is reminiscent of requirements that metrical constituents be headed; cf. Liberman & Prince 1977, Hayes 1995) has exactly the opposite effect of the *ACCENT constraint introduced in section 3.1. In dialects such as Miyakonojô, where the effects of *ACCENT are seen, HAVEACCENT must be low-ranking. Similarly, in dialects where HAVEACCENT is active, as in Hakata, *ACCENT must be low-ranking.

The faithfulness constraint that conflicts with HAVEACCENT is the following:

(21) **F**: DEP(ACCENT) An accent in the output must have a correspondent in the input ('No insertion of accents')

Because accent is obligatory for verbs and adjectives, HAVEACCENT must dominate DEP(ACCENT), as shown in (22).

(22) *yó̲b-u*$_V$ 'call(s)' (Hakata)

/yob-u$_V$/	HAVEACCENT >> DEP(ACCENT)	
a. yobu	*!	
b. ☞ yó̲bu		*

But nouns do not have to obey the markedness constraint HAVEACCENT. This indicates that the following noun-faithfulness constraint dominates HAVEACCENT.

(23) **NF**: DEP$_N$(ACCENT) *In nouns*, an accent in the output must have a correspondent in the input ('No insertion of accents, *in nouns*')

This constraint ranking correctly selects the attested output form both for nouns, as in (24), and for verbs and adjectives, as in (25).

(24) *atama*$_N$ 'head' (Hakata)

/atama$_N$/	DEP$_N$(ACC) >> HAVEACC >> DEP(ACC)		
a. ☞ atama		*	
b. at̲áma	*!		*

(25) *yó̲b-u*$_V$ 'call(s)' (Hakata)

/yob-u$_V$/	DEP$_N$(ACC) >>	HAVEACC >>	DEP(ACC)
a. yobu		*!	
b. ☞ yó̲bu			*

Accent location in Tôkyô and accentedness in Hakata are examples of Noun-Contrast behavior, where only nouns are permitted to have a phonological contrast. This privileged behavior of nouns comes from a constraint ranking of the following type.

(26) Ranking: **NF** >> **M** >> **F**
Result: Only nouns have the relevant phonological contrast

Here, a markedness constraint dominates a general faithfulness constraint, banning a certain structure from words in general. However, the markedness constraint is in turn dominated by a noun-specific faithfulness constraint, requiring that nouns be faithful to their input forms, and in effect making nouns exempt from the markedness constraint that applies to words of other categories.

3.4 Summary: Factorial typology of acccent phenomena

With a constraint set that contains markedness constraints, general faithfulness constraints, and noun-faithfulness constraints, grammars corresponding to all three observed types of accent behavior can be generated.

(27)a. No-Contrast behavior — Ranking: **M** >> **NF**, **F**; Result: No categories have the contrast

b. All-Contrast behavior — Ranking: **F** >> **M** (**NF**: rank irrelevant); Result: All categories have the contrast

c. Noun-Contrast behavior — Ranking: **NF** >> **M** >> **F**; Result: Only nouns have the contrast

Given this constraint set, no other result is possible. In particular, no reranking of these constraints produces a grammar in which words of some category can have a certain phonological contrast but nouns can not. Therefore, this analysis is able to generate all and only the grammars that are actually attested among the dialects of Japanese with respect to accent behavior.

4. Issues and ramifications

In addition to providing an explanation for the typology of accent behavior in the dialects of Japanese, the proposal developed above has several ramifications, some of which suggest directions to take in further research.

4.1 Lexical representation of accent

Previous analyses of Japanese dialects with Noun-Contrast-type accent behavior, such as McCawley (1968) and Poser (1984) for Tôkyô, have encountered a dilemma concerning the lexical representation of accent. For nouns, accent location is distinctive, so accent must be marked in the lexicon on the specific vowel (or mora) where it will surface. For verbs and adjectives, however, accentedness is distinctive but accent location is not. Given the derivational framework in which these analyses are based, the only way to represent verb/adjective accent in the lexicon (without "redundancy") is by means of a *morpheme-level* feature such as [±Accent] that leaves accent location within the morpheme lexically underspecified. The final result of such an analysis is that noun accent and verb/adjective accent are represented in the lexicon in fundamentally different ways, despite the intuitive sense that they are the same entity.

The present analysis is able to avoid that dilemma because, being framed in OT, it relates the presence or absence of phonological contrast to the constraint ranking, not to restrictions on the lexicon. Verb/adjective accent can be represented in the lexicon just as noun accent is -- as an accent associated with a particular vowel (or mora), not with a whole morpheme -- and the constraint hierarchy ensures that the appropriate output candidate for a verb or adjective is the one with the accent in the fixed location determined by the markedness constraint.

4.2 Segmental phonology and noun faithfulness

Accentedness and accent location, the phenomena examined in this paper, are canonical examples of suprasegmental phenomena. If noun faithfulness is part of the grammar, it might be expected to show effects in the segmental phonology as well.

One segmental phenomenon of Japanese in which noun faithfulness may play a role is the case of onglides. In certain dialects, including Tôkyô, syllables of the form *CyV*... are permitted, but they are found productively only in nouns. This distribution of onglides might be the result of the constraint ranking in (28).

(28) MAX_{N} >> *COMPLEXONSET >> MAX

In this ranking, the constraint *COMPLEXONSET dominates MAX (the constraint against segmental deletion), with the result that *Cy*... onsets are, in general, banned. But because the noun-faithfulness constraint MAX_{N} is highest ranked, nouns resist segmental deletion. A noun with a *Cy*... onset in its input surfaces with the onglide intact, even though that results in a violation of the lower-ranked *COMPLEXONSET.

However, it is not clear that *noun* / *other category* is the correct distinction to make

in this case. For one thing, there are a small number of exceptions to the ban on onglides outside nouns, such as the verb *syabér-u* 'chat(s)'. More significantly, it appears that *Cy...* syllables are actually banned from all words in the core (Yamato) stratum, to which essentially all verbs and adjectives, as well as some nouns, belong (on lexical strata in Japanese, see McCawley 1968; for an OT treatment, see, e.g., Itô & Mester 1995). Nevertheless, the fact that only nouns can belong to the peripheral strata is itself an example of special noun behavior. Further investigation is needed to determine whether there are any true cases of noun-faithfulness effects in the segmental phonology of Japanese.

4.3 Why *noun* faithfulness?

As noted in section 3.3, domains for which domain-specific faithfulness constraints have been proposed, such as stressed syllables or morphological roots, are typically domains that are phonologically or gramatically salient. Including noun-faithfulness constraints in the grammar therefore implies that nouns are also a salient domain. But why should this be so?

Perhaps the noun-faithfulness effects that we observe in Japanese dialects derive from a more fundamental type of domain-specific faithfulness. Note that in Japanese, nouns are free roots, whereas verbs and adjectives can not occur without inflectional morphology.

(29) a. /áme$_N$/ 'rain' > [áme$_N$] (Examples are from Tôkyô)
b. /nayám-$_V$/ 'to worry' > *[nayám$_V$]
cf. [nayámu$_V$] 'worries', [nayánda$_V$] 'worried', ...
c. /omosiró-$_A$/ 'interesting' > *[omosiró$_A$]
cf. [omosirói$_A$] 'is interesting', [omosíroku$_A$] 'being interesting', ...

Japanese nouns, then, are canonical *free* forms. On the other hand, Japanese verbs and adjectives are closer to *bound* forms. Perhaps the salient domain for which domain-specific faithfulness exists is the domain of *free forms*. Since only nouns are free forms in Japanese, we see noun faithfulness. A language in which, say, nouns and adjectives act as free forms might have noun-and-adjective faithfulness. A cross-linguistic examination of noun faithfulness and related effects is the subject of research currently in progress.

References

Alderete, J. 1995. Faithfulness to Prosodic Heads. Ms., University of Massachusetts Amherst.

Beckman, J. 1995. Shona Height Harmony: Markedness and Positional Identity, in Beckman, Dickey, and Urbanczyk, eds., 53-75.

Beckman, J. 1996. *Positional Faithfulness*. Doctoral dissertation, University of

Massachusetts Amherst.
Beckman, J., L. Walsh Dickey, and S. Urbanczyk, eds. 1995. *University of Massachusetts Occasional Papers in Linguistics 18: Papers in Optimality Theory*. Amherst: Graduate Linguistics Student Association.
Frellesvig, B. 1994. Morphemic Tone and Word Tone in Central Japanese. *Acta Linguistica Hafniensia* 27:147-60.
Haraguchi, S. 1977. *The Tone Pattern of Japanese: An Autosegmental Theory of Tonology*. Tokyo: Kaitakusha.
[Hattori, S. 1951. *Onseigaku* [Phonetics]. Tokyo: Iwanami Shoten.]
Hayata, T. 1977. Seisei akusento ron [A generative theory of accent], in Ono and Shibata, eds., 1977a, 323-360.
Hayata, T. 1985. *Hakata-hôgen no akusento/keitairon* [The accent and morphology of the Hakata dialect]. Fukuoka: Kyûshû Daigaku Shuppankai.
Hayes, B. 1995. *Metrical Stress Theory*. Chicago: University of Chicago Press.
[Hirayama, T. 1943. Akusento bunpu to 1-gata akusento [Distribution of accent systems and one-tonal-class dialects]. *Kokugo akusento no hanasi* [Lectures on accent in Japanese].]
[Hirayama, T. 1960. *Zenkoku akusento ziten* [All-Japan accent dictionary]. Tokyo: Tôkyôdô.]
Itô, J., and A. Mester 1995. The Core-Periphery Structure of the Lexicon and Constraints on Reranking, in Beckman, Dickey, and Urbanczyk, eds., 181-209.
Kindaichi, H. 1977. Akusento no bunpu to hensen [Accent distribution and accent change], in Ono and Shibata, eds., 1977b, 129-180.
[Konoshima, M. 1961. Hôgen no zittai to kyôtûgoka no mondaiten--Aomori [The Aomori dialect: Its reality and the problem of standardization], in Tôjô, M., ed., *Hôgengaku kôza* [A course on dialectology] 2:127-48.]
Liberman, M., and A. Prince 1977. On Stress and Linguistic Rhythm. *Linguistic Inquiry* 8:249-336.
Lombardi, L. 1996. Positional Faithfulness and the Phonology of Voicing in Optimality Theory. Ms., University of Maryland College Park.
McCarthy, J., and A. Prince 1995. Faithfulness and Reduplicative Identity, in Beckman, Dickey, and Urbanczyk, eds., 249-384.
McCawley, J. 1968. *The Phonological Component of a Grammar of Japanese*. The Hague/Paris: Mouton.
Ono, S. and T. Shibata, eds. 1977a. *Iwanami kôza nihongo 5: On'inron* [Iwanami series on the Japanese language 5: Phonology]. Tokyo: Iwanami Shoten.
Ono, S. and T. Shibata, eds. 1977b. *Iwanami kôza nihongo 11: Hôgen* [Iwanami series on the Japanese language 11: Dialects]. Tokyo: Iwanami Shoten.
Padgett, J. 1995. Partial Class Behavior and Nasal Place Assimilation. To appear in *Proceedings of the Arizona Phonology Conference: Workshop on Features in Optimality Theory*, Coyote Working Papers in Linguistics, University of Arizona.
Pierrehumbert, J., and M. Beckman 1988. *Japanese Tone Structure*. Cambridge, Mass.: MIT Press.

Poser, W. 1984. *The Phonetics and Phonology of Tone and Intonation in Japanese*. Doctoral dissertation, MIT.

Prince, A., and P. Smolensky 1993. *Optimality Theory: Constraint Interaction in Generative Grammar*. Ms., Rutgers University and University of Colorado Boulder.

Selkirk, E. 1995. Class notes. Linguistics 751, University of Massachusetts Amherst.

Shibatani, M. 1979. Review of Haraguchi 1977. *Language* 55:4.928-936.

Shibatani, M. 1990. *The Languages of Japan*. Cambridge: Cambridge University Press.

Steriade, D. 1993. Positional Neutralization. Handout from talk presented at NELS 24, University of Massachusetts Amherst.

Uwano, Z. 1977. Nihongo no akusento [Japanese accent], in Ono and Shibata, eds., 1977a, 281-322.

Jennifer L. Smith
Department of Linguistics, South College
University of Massachusetts
Amherst, MA 01003 USA
jlsmith@linguist.umass.edu