University of Massachusetts Occasional Papers in Linguistics

Volume 26 *Papers from the 25th Anniversary -- University of Massachusetts Occasional Papers 24*

Article 16

2000

Accent Insertion in Fukuoka Japanese

Jennifer L. Smith
University of Massachusetts, Amherst

Accent Insertion in Fukuoka Japanese[1]

Jennifer L. Smith

University of Massachusetts, Amherst

1. Introduction

In the dialects of Japanese spoken in the city of Fukuoka, there are two ways in which the prosodic phonology of nouns differs from that of verbs (and adjectives). First, verbs have an obligatory pitch accent, while nouns may be accented or unaccented. These dialects thus differ from dialects such as Tôkyô (McCawley 1968; Poser 1984), in which a word of any category may be either accented or unaccented, as well as from dialects such as Miyakonojô (Hirayama 1943; Haraguchi 1977), in which no lexical items, regardless of category, contrast for accentedness.

The second difference between nouns and other lexical words in Fukuoka is in the phonology of accent location. In (accented) nouns, the location of the accent is lexically contrastive. However, the accent in verbs has a fixed location: it must appear on the penultimate syllable. The Fukuoka dialects are therefore different from those such as Kagoshima (Hirayama 1960; Haraguchi 1977), in which accent location is fixed for accented words of all categories.

In both of these aspects of the prosodic phonology of Fukuoka Japanese, not only do nouns and other lexical words behave differently, but in fact nouns are seen to have a greater degree of phonological freedom than other words. This paper gives an account for why, in Fukuoka Japanese and a number of other languages, nouns have special phonological privilege: The universal constraint set contains noun-faithfulness constraints, that is, domain-

[1]This paper is part of ongoing research on noun faithfulness, and many people have given me valuable feedback on aspects of this research. Special thanks to Teruhiro Hayata and Tomoyuki Kubo for providing me with a great deal of information on the phonology of Fukuoka dialects, and to Tomoyuki Kubo, John McCarthy, Lisa Selkirk, members of the UMass Phonology Reading Group, attendees at a Kyushu University linguistics colloquium, and participants at the UMass Linguistics 25th Reunion Poster Session for comments and discussion. Errors and inadequacies are of course my responsibility. This research was partially supported by NSF grant SBR-9420424.

Paul de Lacy and Anita Nowak (eds.). UMOP 24, 245-257

specific (positional) faithfulness constraints for which the relevant domain is the category *noun*. In a language where noun-faithfulness constraints are ranked high in the hierarchy, nouns can license contrasts even when other words can not.

The proposal is developed as follows. Section 2 gives an overview of the phonology of accent in Fukuoka Japanese. Section 3 outlines the theory of noun faithfulness. Sections 4 and 5 present noun faithfulness-based analyses of accentedness and accent location respectively. Finally, conclusions and implications are discussed in Section 6.

2. Overview: Accent in Fukuoka Japanese

The intonational system of Fukuoka Japanese, as described by Hayata (1985), is in many ways similar to that of Tôkyô (McCawley 1968; Poser 1984; Pierrehumbert & Beckman 1988). A phonological phrase generally begins on a low pitch but quickly attains a high pitch, presumably due to a phrasal high (H) tone, as has been proposed for Tôkyô (Pierrehumbert & Beckman 1988). This high pitch extends to the end of the phonological phrase, unless a pitch accent, which is realized as an abrupt fall from high to low (H*+L), is present. As noted above, in Fukuoka dialects the presence or absence of a pitch accent is phonologically contrastive for nouns, but not for other lexical words.

The following examples demonstrate that Fukuoka nouns can be accented or unaccented.

(1) *Unaccented nouns*

(a) atama	'head'
(b) tentaibooenkyoo	'telescope'

(2) *Accented nouns*

(a) inóti	'life'
(b) óokami	'wolf'

Unaccented nouns surface without a pitch accent even when spoken in isolation. This fact indicates that there is no requirement on any level of the prosodic hierarchy above the word (such as phonological phrase, intonational phrase, or utterance) such that it must contain a pitch accent.

Furthermore, even the location of the accent is lexically contrastive for nouns. For example, form (2a) has its accent on the second syllable, while form (2b) has its accent on the initial syllable.

On the other hand, verbs and adjectives are much more restricted with respect to the phonology of accent. Words belonging to these categories (henceforth called "verbs" for

simplicity) obligatorily surface with a pitch accent.[2]

(3)	/kak-/$_V$	'to write'
	(a) káku	'writes'
	(b) káita	'wrote'
	(c) kakán	'doesn't write'
(4)	/aka-/$_A$	'red'
	(a) akáka~akái	'(is) red'
	(b) akakátta	'was red'
	(c) akakaróo	'(is) probably red'

As the examples in (3) and (4) show, not only is an accent obligatorily present in verbs, but its location is also fixed. The accent always appears on the (head of the syllable containing the) penultimate mora.

Previous analyses of accent in Fukuoka (Hayata 1985; Kubo 1989) attempt to account for these two dimensions of predictability in verbs by proposing a complex accent-insertion rule such as the following.

(5) *Penultimate accent insertion rule* (from Hayata 1985:21):

In a phonological phrase that ends in a VP and has no other accent, insert an accent on the syllable containing the penultimate mora.

This rule is complex in the sense that it both *inserts* an accent and *fixes* its position as part of the same process.

However, this kind of rule seems problematic. First, "a phonological phrase that ends in a VP" is arguably not a unit that the phonology can utilize. According to the prosodic-structure theory of the syntax-phonology interface (e.g., Selkirk 1986, 1995), detailed information about syntax is not available to the phonology, which has access only to prosodic structure, not to syntactic structure per se. While prosodic structure is itself formed with some influence from the syntax (for example, the edge of a phonological phrase may correspond to the edge of a maximal projection in the syntax), it does not include specifically

---

[2]There are a small number of exceptions to this statement. First, it is a property of WH-questions in Fukuoka dialects that there be no accents between the WH-word and the complementizer with which it is associated (Hayata 1985; Kubo 1989, 1992; Smith in progress). That is, in WH-questions, not only are verbs not accented, but even the underlying accents in accented nouns disappear.

(i)	Dare-ga Kyooto iku [$\varnothing_C$]?	'Who's going to Kyoto?'
	who-NOM *Kyoto go*	*cf.* Kyóoto 'Kyoto'; íku 'go'

Second, Kubo (1992) identifies a few special modal contexts in which verbs may surface unaccented.

syntactic information, such as the category of a maximal projection. Therefore, the phonology can not recognize that a group of words forms a VP.

Second, the rule shown in (5) collapses into one insertion process the two aspects of the accent phonology of verbs that are obligatory in Fukuoka: the *presence* of accent and the *location* of accent. However, an examination of other dialects of Japanese reveals that these are properties that are independently regulated.[3] For example, Tôkyô is like Fukuoka in that the location of accent in verbs is fixed. However, in that dialect the presence of accent in verbs is not mandatory; accented verbs and unaccented verbs are lexically contrastive.

For these reasons, then, it seems advisable to avoid using a complex insertion rule such as (5) and instead to attempt to treat the phonology of accent in Fukuoka with an analysis that (a) makes reference only to categories that are motivated in other work on the syntax-phonology interface and (b) allows the presence and location of accent to be regulated separately. The noun faithfulness-based analysis outlined in Sections 4 and 5 below meets these criteria. First, however, Section 3 introduces and motivates the theory of noun faithfulness.

3. Noun faithfulness

In the original conception of Optimality Theory (OT; Prince & Smolensky 1993), the presence or absence of a particular phonological contrast in a language is derived from the interaction of markedness and (general) faithfulness constraints. Markedness constraints (**M**) serve to ban a particular structure (or feature) from output forms, and faithfulness constraints (**F**) require the input specification for a particular structure to be maintained in the output. When the ranking of markedness and faithfulness constraints relevant to a certain structure is **M>>F** (**M** dominating **F**), then the structure will not appear in any output forms, so the language can have no phonological contrast involving that structure. On the other hand, with the opposite ranking, **F>>M**, faithfulness takes precedence and the input specifications for the structure in question are maintained in output forms. That is, inputs specified for the structure correspond to outputs that have the structure, and inputs not specified for the structure correspond to outputs that do not have the structure. In this case, the language does have a phonological contrast for the structure in question.

However, not all languages permit a phonological contrast to appear freely in all positions. Sometimes a contrast is restricted to certain salient domains within a language. The theory of positional (or domain-specific) faithfulness (PF) has been proposed by Beckman (1998) to explain why positions of greater salience, either phonetically or psycholinguistically, sometimes license more phonological contrasts than other positions in the same language. Salient domains licensing such contrasts that have been discussed in the literature include stressed syllables (Alderete 1995); syllable onsets or [+release] consonants (Lombardi 1996, Padgett 1995; cf. Steriade 1997); roots, as opposed to affixes (McCarthy & Prince 1995); and root-initial syllables (Beckman 1995, 1998).

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

The analysis put forth for such cases is that each of these salient domains is associated with a family of faithfulness constraints that is relevant only to that domain. In a language where one such domain-specific faithfulness constraint is ranked so as to be active in the language, there will be a phonological contrast whose occurrence is limited to that particular domain (see 6f)).

(6) *Typology of possible rankings*

- **M** *highest ranked*
  - (a) **M >> F >> PF** No contrast in the language
  - (b) **M >> PF >> F** No contrast in the language
- **F** *dominates* **M**
  - (c) **F >> M >> PF** Contrast throughout the language
  - (d) **F >> PF >> M** Contrast throughout the language
  - (e) **PF >> F >> M** Contrast throughout the language
- **M** *dominates* **F**, *but* **PF** *dominates* **M**
  - (f) **PF >> M >> F** Contrast in privileged position P only

This paper makes the case that in Fukuoka Japanese, nouns license phonological contrasts that are not possible for words of other categories. In fact, this phenomenon is not unique to Fukuoka; there are a number of languages in which nouns are phonologically privileged. For example, in Spanish, nouns contrast for location of stress, but verbs do not (Harris 1969). In Arabic, nouns have more possible stem shapes than verbs have (McCarthy & Prince 1990). In Sinhala, verb-stem final vowels are deleted in certain contexts, but noun-stem final vowels are not (Feinstein 1979; Keer 1996).

These patterns can be accounted for if the theory of positional faithfulness is extended so that the list of salient domains that permit domain-specific faithfulness constraints includes the lexical category *noun*. In other words, the universal constraint hierarchy includes noun-faithfulness constraints (**NF**), faithfulness constraints that are relevant only to nouns (see also Smith 1997, 1998ab). Following the general schema for positional faithfulness as shown in (6), when a language has the ranking **NF>>M>>F**, nouns will be able to license a contrast that other categories can not.

Beckman (1998) proposes that the positions or domains that license special faithfulness constraints can be only those that are phonetically or grammatically salient. There is some evidence that, by this criterion, the inclusion of nouns in the set of domains that have special faithfulness constraints is justified: nouns have been shown to have greater psycholinguistic salience than verbs (Goldin-Meadow et al. 1976; Huttenlocher & Lui 1979; Gentner 1982; see Smith 1997 for a review of this evidence).

The next two sections of this paper argue that each of the cases of phonological privilege for nouns found in Fukuoka Japanese can be accounted for as a noun-faithfulness effect, with a **NF>>M>>F** constraint ranking.

4. The property of accentedness

As shown in examples (1)-(4) above, in Fukuoka, verbs are required to have an accent, but nouns are not. That is, accentedness is contrastive only for nouns, not for other categories. This phenomenon can be analyzed as a noun-faithfulness effect, as follows.

First, because verbs have a mandatory accent, there must be a constraint requiring that a word contain an accent.[4] This constraint can be represented as HEADEDNESS, as formulated in (7).

(7) HEADEDNESS Every word has an accent

This constraint is based loosely on the constraint HEADEDNESS, used by, e.g., Selkirk (1995) to ensure that all prosodic constituents contain a head, that is, a prosodic prominence. It can be argued that in a pitch-accent system as found in Fukuoka, the pitch accent is not itself a prosodic prominence, but rather a tonal element that is associated with such a prominence (as happens in languages such as English that have phrase-level, rather than word-level, pitch accents (Pierrehumbert 1980)). Under this analysis, every noun in Fukuoka may well have a prosodic prominence; however, not all of them are associated with a pitch accent. For this type of analysis, then, there are actually two relevant markedness constraints:

(8) HEADEDNESS Every prosodic constituent has a prominence
(This constraint may be undominated universally.)

TONE-TO-PROMINENCE Every prominent syllable has a pitch accent
(This is the constraint that is violated by nouns in Fukuoka.)

However, for simplicity of exposition, the constraint HEADEDNESS as defined in (7) will be adopted for this discussion instead of the pair of constraints in (8).

The faithfulness constraint that is violated in verbs in order to satisfy HEADEDNESS is the constraint DEP(ACCENT), which forbids the insertion of an accent (see McCarthy & Prince 1995 on the DEP family of constraints).

(9) DEP(ACCENT) Output accents have input correspondents

Because DEP(ACCENT) is violated and HEADEDNESS is not, the ranking of these constraints is HEADEDNESS >> DEP(ACCENT), as shown in (10).

---

[4]Hayata (1985) makes his rule for accent insertion, shown in (5), a phrase-level rule (recall that it applies to a "phonological phrase that ends in a VP and has no other accents"). His reason for treating accent insertion as a phrase-level and not a word-level process is presumably in order to account for the observation that no accent appears on the verb when a preceding word in the same phonological phrase bears an accent. But this fact can be attributed to the same force at work in Tôkyô and other dialects (McCawley 1968; Poser 1984) that allows only one accent, the leftmost, to surface within a phonological (minor) phrase. Therefore, there is no reason to maintain that verb accent insertion itself must be sensitive to phonological-phrase structure in Fukuoka; it can be treated as a word-level process.

(10) *Accents are obligatory for verbs*

/tabeta/$_V$	HEADEDNESS >>	DEP(ACC)
a. tabeta	*!	
☞ b. tabéta		*

Unlike verbs, nouns are permitted to surface without an accent. As outlined in Section 3 above, a contrast is restricted to a privileged domain when the relevant constraints are ranked as in (6f), **PF >> M >> F**. By this logic, the high-ranking constraint that allows nouns to surface without a pitch accent is the noun-faithfulness constraint DEP(ACCENT)$_N$, a DEP(ACCENT) constraint that is relevant only to a word of category *noun*.

(11) DEP(ACCENT)$_N$ In nouns, output accents have input correspondents

With this constraint ranked above HEADEDNESS, unaccented nouns are permitted to surface unchanged, as in (12). However, because verbs are not subject to DEP(ACCENT)$_N$, the highest-ranked constraint that is relevant for them is HEADEDNESS. Therefore, as shown in (13), the new ranking still correctly requires verbs to surface with a pitch accent.

(12) *Nouns resist accent insertion*

/atama/$_N$	DEP(ACC)$_N$ >>	HDNESS >>	DEP(ACC)
☞ a. atama		*	
b. atáma	*!		*

(13) *Verbs are not affected by noun-faithfulness constraints*

/tabeta/$_V$	DEP(ACC)$_N$ >>	HDNESS >>	DEP(ACC)
a. tabeta		*!	
☞ b. tabéta			*

In summary, verbs are obligatorily accented because the markedness constraint HEADEDNESS dominates DEP(ACCENT), the general faithfulness constraint against accent insertion. However, the noun-specific faithfulness constraint DEP(ACCENT)$_N$ dominates HEADEDNESS. As a result, for nouns, it is better to surface faithfully with no accent, violating HEADEDNESS, than to insert an accent, which would cause a violation of undominated DEP(ACCENT)$_N$.

5. On accent location

The second respect in which nouns exhibit privileged behavior in Fukuoka Japanese is in the location of the pitch accent within a word. As demonstrated in (2)-(4), nouns (that

are accented) contrast phonologically for the location of their accent, but verb accents are always penultimate. Again, this case of contrast possibility for nouns alone can be analyzed as a noun-faithfulness effect with a **NF** >> **M** >> **F** ranking.

Predictable penultimate accent can be analyzed, as in Prince & Smolensky (1993), as the result of the interaction of two markedness constraints.

(14) ALIGN-R Every accent falls at the right edge of some prosodic word

(15) NONFINAL(μ) There is no accent on the final mora

The ranking NONFINAL(μ) >> ALIGN-R demands that any pitch accent surface as far to the right as possible without landing on the final mora. That is, this ranking requires accent to be penultimate.

Of course, in order for the markedness constraints to enforce penultimate accent in output forms, they must dominate whatever faithfulness constraints would act to maintain the location of an input accent. These faithfulness constraints might take the form of a "NOFLOP" constraint, which requires the preservation of underlying autosegmental links. Or, they might be more like featural IDENT constraints (McCarthy & Prince 1995), requiring that an output segment have the same status, in this case "accented" or "unaccented", as its input correspondent. In the present discussion, the faithfulness constraints that are responsible for demanding the preservation of the location of input accents will simply be encapsulated with the label FAITHLOC(ACCENT). Whatever their specific formulation, these are the constraints that must be dominated by the markedness constraints NONFINAL(μ) >> ALIGN-R in order to produce default penultimate accent. This ranking and its effects are shown in (16).[5]

(16) *Accents are penultimate*[6]

/tábeta/$_V$	NONFIN >>	ALIGN-R >>	FAITHLOC
a. tábeta		**!	
☞ b. tabéta		*	*
c. tabetá	*!		*

Once again, however, nouns behave differently from other words. Noun accents are not required to be penultimate. In fact, the location of accent for nouns is lexically contrastive. This pattern can be accounted for if the noun-specific faithfulness constraint

[5]In the following discussion, FAITHLOC violations are assumed to be categorical rather than gradient. This arbitrary choice does not affect candidate selection.

[6]When the penultimate mora is not the head of its syllable, the accent shifts one mora to the left, to the mora that is the head of the syllable containing the penultimate mora: tát.ta 'stood'. This suggests that there is a constraint requiring accents to fall on syllable heads, which is undominated in Fukuoka (and, in fact, in many other dialects of Japanese as well).

FAITHLOC(ACCENT)$_N$, which requires that nouns maintain their input accent location, dominates ALIGN-R. As a result, the pressure to have the accent fall as close to the right edge as possible can not cause nouns to be unfaithful to their input accent location.

Like other constraints in the hierarchy, noun-faithfulness constraints can be dominated. They are dominated in languages where nouns do not show special behavior, for example. And even in Fukuoka Japanese, there is evidence that the relatively high ranking constraint FAITHLOC(ACCENT)$_N$ is itself dominated. Specifically, for older speakers of the Hakata (central/eastern Fukuoka city) dialect as described by Hayata (1985), nouns can not be accented on a final light syllable. This means that the constraint NONFINAL(μ), invoked above to explain why verb accents are penultimate rather than final, outranks even FAITHLOC(ACCENT)$_N$ and is therefore obeyed even by nouns.[7]

The ranking of the four constraints relevant for accent location is thus as follows: NONFINAL(μ) >> FAITHLOC(ACCENT)$_N$ >>ALIGN-R >> FAITHLOC(ACCENT). That this ranking allows underlying noun accents (other than on the final mora) to surface unchanged is shown in (17). That this more comprehensive ranking still makes the right predictions for verbs is demonstrated in (18); again, the reason why accent location is fixed in verbs but not in nouns is because the higher-ranked FAITHLOC(ACCENT)$_N$ is not relevant for verbs, leaving their accent location to be decided by ALIGN-R.

(17) *Nouns maintain underlying accent position*

/óokami/$_N$	NONFIN >>	FAITHLC$_N$ >>	ALIGN-R >>	FAITHLC
☞ a. óokami			***	
b. ookámi		*!	*	*

(18) *Verbs are unaffected by noun-faithfulness constraints*

/tábeta/$_V$	NONFIN >>	FAITHLC$_N$ >>	ALIGN-R >>	FAITHLC
a. tábeta			**!	
☞ b. tabéta			*	*

To summarize the analysis of accent-location facts in Fukuoka Japanese: Undominated NONFINAL(μ) ensures that no word, of any category, can have an accent on the final mora. The ranking of ALIGN-R over FAITHLOC(ACCENT) means that in general, any input accent location is disregarded in favor of a right-edge (penultimate, because it can not be final) location. However, the ranking of noun-specific FAITHLOC(ACCENT)$_N$ above ALIGN-R means that, again with the exception of an accent on the final mora, input accents surface unchanged for nouns. Just as for the analysis of accentedness presented in Section 4, in the present

[7]Hayata (1985) observes that younger speakers appear not to have this restriction. Presumably there has been a diachronic change, involving among other things a reranking of FAITHLOC(ACCENT)$_N$ above NONFINAL(μ).

analysis of accent location, a **NF >> M >> F** ranking accounts for why nouns exhibit a phonological contrast that other lexical words do not.

6. Conclusion

This paper has shown that in Fukuoka Japanese, as in a number of other languages, nouns license phonological contrasts that words of other lexical categories do not. The distinct phonological phenomena of accentedness and accent location in Fukuoka both show greater privilege for nouns than for other words.

The analysis presented here hinges on the proposal that the universal set of constraints contains faithfulness constraints that are specific to nouns. This theory of noun faithfulness is an extension of the theory of positional faithfulness (Beckman 1998); specifically, it is proposed that the set of salient domains that have specific faithfulness constraints includes the category *noun*. This proposal has some support in the form of evidence that nouns have greater psycholinguistic salience than words of other categories.

One attractive consequence of Optimality Theory (Prince & Smolensky 1993) is that, because all constraints are held to be present in all languages (although with different rankings), strong typological predictions are made whenever new constraints are proposed. In this case, the proposal that there are specific faithfulness constraints for nouns, but not for other categories, predicts that there can exist a language in which all categories have a particular contrast, languages in which no categories have a particular contrast, and languages in which only nouns have a particular contrast. However, a language in which verbs license a contrast that nouns do not is predicted *not* to exist. An apparent counterexample to this prediction, the Tucanoan language Tuyuca (Barnes 1996), has been reanalyzed in a way compatible with the theory of noun faithfulness (Smith 1997, 1998b). The question of whether all apparent cases of verb-specific contrast can be eliminated is the subject of current research.

In any case, with the inclusion of noun-faithfulness constraints in the grammar, there is a way to formally derive the greater phonological freedom that nouns show in Fukuoka Japanese and other languages, linking this freedom to nouns' special cognitive salience.

Appendix: Some representative verb forms (from Hayata 1985)

	/tat-/ 'to stand'	/tabe-/ 'to eat'		
(a)	ta.tán	ta.bén	-an	(negative imperfective)
(b)	tát.ta	ta.bé.ta	-ta	(perfective)
(c)	tát.te	ta.bé.te	-te	(perfective continuative)
(d)	ta.tóo	ta.byóo	-oo	(stem conjectural)
(e)	tá.tu	ta.bé.ru	-ru	(imperfective)
(f)	tá.ti	tá.be	-i	(imperfective continuative)
(g)	tá.te	ta.bé.re	-re	(imperative)
(h)	ta.ti.mée	ta.be.mée	-i-mee	(negative conjectural)
(i)	tat.ta.róo	ta.be.ta.róo	-ta-roo	(perfective conjectural)
(j)	ta.tan.zyát.ta	ta.ben.zyát.ta	-an-zyar-ta	(negative perfective)

Note: There are two forms with antepenultimate accents described by Hayata (1985): tátta-ra/tabéta-ra (perfective conditional) and tátu-na/tabéru-na (negative imperative). These forms seem to be related to the perfective and imperfective forms, respectively, by high-ranking output-output faithfulness constraints (Burzio 1994; Benua 1998).

References

Alderete, John. 1995. "Faithfulness to prosodic heads." Ms., University of Massachusetts, Amherst.

Beckman, Jill N. 1995. "Shona height harmony: Markedness and positional identity." In J. Beckman, L. Walsh-Dickey, and S. Urbanczyk, eds., *UMOP 18*. Amherst: GLSA, 53-75.

Beckman, Jill N. 1998. *Positional Faithfulness*. PhD dissertation, University of Massachusetts, Amherst.

Benua, Laura. 1998. *Transderivational Identity: Phonological Relations Between Words*. PhD dissertation, University of Massachusetts, Amherst.

Burzio, Luigi. 1994. *Principles of English Stress*. Cambridge: Cambridge University Press.

Feinstein, Mark. 1979. "Prenasalization and syllable structure." *Linguistic Inquiry* 2:245-278.

Frellesvig, Bjarke. 1994. "Morphemic tone and word tone in central Japanese." *Acta Linguistica Hafniensia* 27:147-60.

Gentner, Dedre. 1982. "Why nouns are learned before verbs: Linguistic Relativity versus Natural Partitioning." In S. Kuczaj, II, ed., *Language Development*. Hillsdale, NJ: Erlbaum.

Goldin-Meadow, Susan, Martin E. P. Seligman, and Rochel Gelman. 1976. "Language in the two-year old." *Cognition* 4:189-202.

Haraguchi, Shôsuke. 1977. *The Tone Pattern of Japanese: An Autosegmental Theory of Tonology*. Tokyo: Kaitakusha.

Harris, James W. 1969. *Spanish Phonology.* Cambridge, MA: MIT Press.

Hayata Teruhiro. 1985. *Hakata-hougen no akusento · keitairon* [The accent and morphology of the Hakata dialect]. Fukuoka: Kyushu University Press.

Hirayama Teruo. 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 Teruo. 1960. *Zenkoku akusento ziten* [All-Japan accent dictionary]. Tôkyô: Tôkyôdô.

Huttenlocher, Janellen, and Felicia Lui. 1979. "The semantic organization of some simple nouns and verbs." *Journal of Verbal Learning and Verbal Behavior* 18:141-162.

Keer, Ed. 1996. "Floating moras and epenthesis in Sinhala." Ms., Rutgers University.

Kubo Tomoyuki. 1989. "Hukuoka-si hougen no, *dare · nani* tou no gimonsi o hukumu bun no pittipataan [The pitch pattern of sentences containing question words such as *dare*, *nani* in Fukuoka city dialects]." *Kokugogaku* 156:71-82.

Kubo Tomoyuki. 1992. "Hukuoka-si hougen ni okeru akusento syoukyo ni tuite [On accent deletion in Fukuoka city dialects]." In T. Kunihiro, ed., *Nihongo intoneesyon no jittai to bunseki.* Tokyo: Ministry of Education, Science, and Culture.

Lombardi, Linda. 1996. "Positional faithfulness and the phonology of voicing in Optimality Theory." Ms., University of Maryland, College Park.

McCarthy, John, and Alan Prince. 1990. "Prosodic morphology and templatic morphology." In M. Eid and J. McCarthy, eds., *Perspectives in Arabic Linguistics II.* Amsterdam/Philadelphia: Benjamins.

McCarthy, John, and Alan Prince. 1995. "Faithfulness and reduplicative identity." In J. Beckman, L. Walsh-Dickey, and S. Urbanczyk, eds., *UMOP 18.* Amherst: GLSA, 249-384.

McCawley, James D. 1968. *The Phonological Component of a Grammar of Japanese.* The Hague/Paris: Mouton.

Padgett, Jaye. 1995. "Partial class behavior and nasal place assimilation." *Proceedings of the Arizona Phonology Conference: Workshop on Features in Optimality Theory.* Coyote Working Papers in Linguistics, University of Arizona.

Pierrehumbert, Janet. 1980. *The Phonology and Phonetics of English Intonation.* PhD dissertation, MIT.

Pierrehumbert, Janet, and Mary Beckman. 1988. *Japanese Tone Structure.* Cambridge: MIT Press.

Poser, William J. 1984. *The Phonetics and Phonology of Tone and Intonation in Japanese.* PhD dissertation, MIT.

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

Selkirk, Elisabeth O. 1986. "On derived domains in sentence phonology." *Phonology* 3:371-405.

Selkirk, Elisabeth O. 1995. "The prosodic structure of function words." In J. Beckman, L. Walsh-Dickey, and S. Urbanczyk, eds., *UMOP 18.* Amherst: GLSA, 439-469.

Smith, Jennifer L. 1997. "Noun faithfulness: On the privileged behavior of nouns in phonology." Ms., University of Massachusetts, Amherst. ROA #242 [http://ruccs.rutgers.edu/roa].

Smith, Jennifer L. 1998a. "Noun Faithfulness: Evidence from accent in Japanese dialects."

Japanese/Korean Linguistics 7. Stanford: CSLI.
Smith, Jennifer L. 1998b. "Noun faithfulness and word stress in Tuyuca." *ESCOL '97*. Ithaca: CLC.
Steriade, Donca. 1997. "Phonetics in phonology: The case of laryngeal neutralization." Ms., UCLA.

Department of Linguistics
South College
University of Massachusetts
Amherst, MA 01003 USA

jlsmith@linguist.umass.edu