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Noun Faithfulness and Accent in Fukuoka Japanese

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1 Introduction[1]

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

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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 privileges: The universal constraint set contains <u>noun-faithfulness constraints</u>, that is, domain-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.

In Fukuoka dialects, the presence or absence of a pitch accent is phonologically contrastive for nouns.[2]

(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.

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[2] In the examples, Fukuoka Japanese morphemes are shown in a roughly phonemic representation. Certain predictable alternations are not indicated, such as the palatalization of coronal obstruents before high vowels and glides (and, for older Fukuoka speakers, before /e/).

Furthermore, even the location of the accent is lexically contrastive for nouns. For example, in (2a) the accent is on the second (or penultimate) syllable, while in (2b) it is 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) must surface with a pitch accent.[3]

(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. That is, it 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.[4] 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. Therefore, a rule such as (5) that links these two properties can not be extended to dialects of Japanese in which only one of the properties is predictable.

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[3] There are two 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 its associated complementizer (Hayata 1985; Kubo 1989, 1992; Smith in progress). That is, in WH-questions, not only are verbs unaccented, but even the underlying accents in accented nouns disappear.

(i)　　Dare-ga Kyooto iku [Ø$_C$]?　　'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 surface unaccented.

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

Furthermore, this rule seems problematic for other reasons. 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 syntactic information, such as the category of a maximal projection. Therefore, the phonology can not recognize that a group of words forms a VP.

Finally, there is no need for the rule to include the restriction that VP accent insertion is blocked when another accent is present in the same phonological phrase (PPh). This is simply the result of a general accent deletion process in Fukuoka dialects, which deletes all but the leftmost accent in a PPh (Hayata 1985).[5] A verb will always be to the right of other accented material in the same PPh because Japanese is head-final.

For these reasons, then, it seems advisable to avoid using a complex insertion rule such as (5) and instead to treat the phonology of accent in Fukuoka with an analysis that: (a) allows the presence and location of accent to be regulated separately, (b) makes reference only to domains that are motivated in other work on the syntax-phonology interface, and (c) avoids incorporating a general accent deletion process that is known to operate elsewhere in the phonology. 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 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

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[5] An identical process operates in Tôkyô (McCawley 1968; Poser 1984; Pierrehumbert & Beckman 1988) and various other dialects. More specifically, the prosodic unit within which this process applies is that known as the 'minor phrase' (McCawley 1968) or 'accentual phrase' (Pierrehumbert & Beckman 1988).

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 has been proposed (Selkirk 1994; Beckman 1995, 1998; Casali 1996) 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 initial syllables (Beckman 1995, 1998; Casali 1996).

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 positional faithfulness constraint (**PF**) is ranked so as to be active (see 6f), there is a phonological contrast whose occurrence is limited to that particular domain.

(6)   *Typology of possible rankings*[6]
    • **M** highest ranked
       (a) **M** >> **F** >> **PF**   No contrast in the language
       (b) **M** >> **PF** >> **F**

    • **F** dominates **M**
       (c) **F** >> **M** >> **PF**   Contrast throughout the language
       (d) **F** >> **PF** >> **M**
       (e) **PF** >> **F** >> **M**

    • **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; Letterman 1997; 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 specific faith-

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[6] The particular version of positional faithfulness theory implemented here is that of Beckman (1995, 1998). The versions proposed by, e.g., McCarthy & Prince (1995) and Casali (1996) differ in that instead of having **PF** and general **F** constraints that can be freely reranked with respect to one another, they have **PF** constraints for strong positions and '**(-P)F** constraints for weak positions, in the fixed universal ranking **PF** >> **(-P)F**.

fulness constraints includes the lexical category *noun*. In other words, the universal constraint hierarchy includes <u>noun-faithfulness constraints</u> (**NF**), faithfulness constraints that are relevant only to nouns. 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 only be 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** ranking.

4 The property of accentedness

As shown in examples (1)-(4) above, in Fukuoka Japanese, 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, they must be satisfying a constraint requiring that a word contain an accent.[7] This constraint can be represented as HEADEDNESS, as formulated in (7).

(7)   HEADEDNESS   Every word has a pitch 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 is 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 like English that have phrase-level, rather than word-level, pitch accents (Pierrehumbert 1980)). Under such an analysis, every word may well have a prosodic prominence, even if it is not associated with a pitch accent. For this type of analysis, then, there are actually two relevant markedness constraints:

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[7] As discussed in section 2, Hayata's (1985) rule for accent insertion, given in (5), is a phrase-level rule. He considers accent insertion to be a phrase-level and not a word-level process 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 because this fact can be attributed to the general deaccenting rule affecting all noninitial accents in a PPh, verb accent insertion itself can be treated as a word-level process.

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

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

Here, for simplicity of exposition, the constraint HEADEDNESS as defined in
(7) will be adopted rather than 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).

(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 out-
lined 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 ac-
cent 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[8] can be analyzed, as in Prince & Smolensky (1993), as the result of the interaction of two 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. [9]

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 any potential input accent. These faithfulness constraints might take the form of a constraint that requires the preservation of underlying autosegmental links. Or, they might be more like featural IDENT constraints (McCarthy & Prince 1995), requiring

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[8] As with (7)-(8) above, it may be possible to view penultimate accent as caused by constraints on the location of a prosodic prominence (stress), to which a pitch accent is independently associated by TONE-TO-PROM.

[9] 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: omóo.ta 'thought', 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).

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).[10] 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).

(16) *Accents are penultimate*

/tábeta/$_V$	NONFIN >>	ALIGN-R >>	FAITHLOC
a. tábeta		$\mu\mu$!	
⇨ b. tabéta		μ	*
c. tabetá	*!		*

Once again, however, nouns behave differently from other words. Noun accents are not required to be penultimate; the location of accent for nouns is lexically contrastive. This pattern can be accounted for if the noun-specific faithfulness constraint 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.[11]

The ranking of the four constraints relevant for accent location is thus as follows: NONFINAL(μ) >> FAITHLOC(ACC)$_N$ >> ALIGN-R >> FAITHLOC(ACC). 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

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[10] In this discussion, FAITHLOC(ACCENT) violations are assumed to be categorical rather than gradient. This arbitrary choice does not affect candidate selection.

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

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 location*

/óokami/$_N$	NONFIN >>	FAILOC$_N$ >>	ALIGN >>	FAILOC
⇨ a. óokami			μμμ	
b. ookámi		*!	μ	*

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

/tábeta/$_V$	NONFIN >>	FAILOC$_N$ >>	ALIGN >>	FAILOC
a. tábeta			μμ!	
⇨ b. tabéta			μ	*

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 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 as implemented by Beckman (1995, 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 languages 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. All three of these types are in fact attested in dialects of Japanese (Smith 1998a). 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 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, perhaps linking this freedom to nouns' special cognitive salience.

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