

Accentuation in Tokyo and Kyoto Japanese: Toward a unified account

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1 Introduction

Ito and Mester (2016) have given a formal account of accentuation in simplex words (stems) in Tokyo Japanese. I extend their analysis to Kyoto (or Keihan) Japanese. I show that, with the addition of only a few constraints on tone realization and foot alignment, Ito and Mester’s (2016) Optimality-Theoretic account of Tokyo Japanese accent can derive the patterns of accent and tones in Kyoto Japanese, including the “initial tonal registers” which have long been assumed to be underlyingly specified. The proposed analysis further explains the structural reasons for some “gaps” in the tonal melodies of Kyoto Japanese. The ultimate goal of the paper is to develop a unified account of the two major dialects of Japanese.

2 Data: Loanword accent

In this section, I present data of loanwords and lay out the accent and tonal patterns of Kyoto Japanese, highlighting their differences from those of Tokyo Japanese. The purpose of this study is to investigate the grammatical principles of the Japanese dialects which regulate word prosody. It is generally agreed in the literature that loanwords show more regular (or grammar-driven) phonological patterns than native words (see Ito and Mester 2016). I thus adopt the former as a main data source.

I compiled a database of 1,092 loans with annotated tonal melodies for the two dialects in question. The words were mostly taken from Mutsukawa (2009).¹ In this paper, I focus on three-mora and four-mora words composed of light syllables in order to illustrate the most general patterns. (See Ito and Mester 2016 for further complications in words with heavy syllables.) The table in (1) shows the number of three-mora items by prosodic patterns. For tonal melodies, I represent high-toned moras with H, low-toned moras with L, and accented moras with H*. In example words, I indicate high-toned moras with an acute, low-toned moras with no accent mark, and accented moras with an acute and also in bold for clarity.

(1) Tonal melodies of three-mora loans ($n = 91$)

<i>Tokyo</i>				<i>Kyoto</i>			
Melody	Word	Count	Rel. Freq.	Melody	Word	Count	Rel. Freq.
H*LL	sá rada	80	88%	H*LL	sá rada	70	77%
LH*L	sutóa	6	7%	LH*L	banána	18	20%
LHH	botóru	5	5%	HHH	bótóru	2	2%
				LLH	okurá	1	1%

As can be seen, in Tokyo Japanese, three-mora words made of light syllables predominantly (88%) show antepenultimate accent, which is often deemed the “default” accent pattern (Martin 1952; also see Ito and Mester 2016 and references therein), as in *sá*rada ‘salad’, *banána* ‘banana’ and *tómato* ‘tomato’. Kyoto Japanese similarly assigns antepenultimate accent to most (77%) three-mora items, as in *sá*rada; however, it also gives penultimate accent to not a few (20%), as in *banána* and *tomáto*. Thus, one of the distinctive characteristics of Kyoto Japanese is this penultimacy in three-mora words.

It is worth noting here that there are some “gaps” in the data. Generally speaking, Kyoto Japanese has a larger number of tonal melodies for a given prosodic structure than Tokyo Japanese because of

¹Apparent errors were corrected. Mutsukawa (2009) uses the word “Kansai Japanese” for the dialect referred to here as “Kyoto Japanese.”

the so-called “initial tonal registers”; the beginning of a word is either high-toned or low-toned.² Most previous studies assume (either explicitly or implicitly) that a word’s tonal register is unpredictable and lexically determined (see e.g. Haraguchi 1977; Pierrehumbert and Beckman 1988; Uwano 1989; Nakai 2002). Notice, however, that not all logically possible prosodic patterns are present in (1). For example, the tonal melody HH*L (i.e. penultimate accent with initial H) is never found in the data of loanwords. Other studies have revealed that HH*L is (becoming) extremely rare also in the native vocabulary (see Yoshida and Zamma 2001; Nakai 2002), suggesting that it is a systematic gap.

Table (2) shows the number of four-mora items by tonal melodies.

(2) Tonal melodies of four-mora loans ($n = 55$)

<i>Tokyo</i>				<i>Kyoto</i>			
Melody	Word	Count	Rel. Freq.	Melody	Word	Count	Rel. Freq.
H*LLL	píkurusu	20	36%	H*LLL	píkurusu	19	35%
LH*LL	papúrika	10	18%	LH*LL	papúrika	10	18%
LHH*L	deráwéa	2	4%	HHH*L	deráwéa	1	2%
LHHH	abókádó	23	42%	HHHH	ábókádó	25	45%

The patterns in four-mora words are essentially similar in the two dialects. They are quite often unaccented (42% and 45% respectively).³ If accented, they generally receive initial accent (36%; 35%) or antepenultimate accent (18%; 18%); penultimate accent is also possible but is very rare (4%; 2%). It is important to note that, in Kyoto Japanese, antepenultimate accent never co-occurs with initial H tone (i.e. no HH*LL). Furthermore, unaccented four-mora words always have initial H tone (i.e. HHHH) and never initial L tone, which would yield LLLH with tone spreading (i.e. no LLLH). This again suggests that there are gaps in the patterns.

To summarize, the general prosodic patterns of loanwords are not vastly different between Tokyo Japanese and Kyoto Japanese. A majority of three-mora words show antepenultimate accent, while four-mora words tend to be unaccented, or else have initial/antepenultimate accent. One notable difference is that three-mora words may also have penultimate accent in Kyoto Japanese (e.g. *banána*). Also, the observed tonal patterns in Kyoto Japanese are somewhat limited given its two possible tonal registers, indicating that there are systematic gaps.

3 Proposal: A foot-based account of tonal melodies

In this section, I first introduce Ito and Mester’s (2016) foot-based account of Tokyo Japanese accent. Building on their theory, I then develop an analysis of accent location and tonal melodies in Kyoto Japanese. I show that the proposed grammar correctly generates attested patterns and excludes unattested ones, revealing the structural reasons for the tonal registers as well as the gaps discussed in the previous section.

3.1 Tokyo Japanese: Ito and Mester (2016)

We have seen that three-mora words mostly have antepenultimate accent in Tokyo Japanese. Ito and Mester (2016) analyze them as having a trochaic foot with a final extrametrical syllable, as in (*sára*)*da*. In OT terms, TROCHEE, which requires feet to have trochaic patterns, is ranked relatively high in the grammar. Other relevant constraints are INITIALFOOT which requires every prosodic word to begin with a foot, NONFIN(FOOT’) which bans a head foot (a foot containing prominence) occurring at the

²This initial tone may undergo spreading. For example, in an unaccented word, initial L tone spreads till it hits final H, as in *okurá* LLH ‘okra’, and initial H tone also spreads till the end of the word, as in *bótóru* HHH ‘bottle’.

³The fact that four-mora words tend to be unaccented in Tokyo Japanese has been pointed out by a number of studies (Akinaga 1981, 1998; Kubozono and Ogawa 2004; also see Ito and Mester 2016 and references therein).

right edge of the word, and FOOTBIN which requires every foot to be binary. Interactions of these constraints yield antepenultimacy, as is illustrated in the tableau in (3).⁴

(3) Antepenultimacy in three-mora words (Tokyo Japanese)

banana	NOLAPSE	TROCHEE	NONFIN σ	FTBIN	NONFINFT'	INIFT	RTMOST	WDACC	PARSE σ
☞ (bána)na									*
(baná)na		*!							*
ba(nána)					*!	*			*
(bána)(na)			*!	*			*		
(ba)(nána)				*!	*				
(ba)(náná)				*!				*	

Perhaps the highlight of Ito and Mester (2016) is the fact the same grammar may also derive unaccentedness. Under their analysis, four-mora words are fully parsed into bimoraic feet without violating FOOTBIN, as in $(\mu\mu)(\mu\mu)$. With this foot structure, placing accent in either foot would violate RIGHTMOST, which requires a head foot to be the rightmost foot, or NONFIN(FOOT'), which bans a head foot at the right word edge. The conflict is then resolved by rendering the word unaccented at the cost of violating lower-ranked WORDACCENT, which requires a prosodic word to have accent. This is illustrated in tableau (4).

(4) Unaccentedness in four-mora words (Tokyo Japanese)

abokado	NOLAPSE	TROCHEE	NONFIN σ	FTBIN	NONFINFT'	INIFT	RTMOST	WDACC	PARSE σ
(ábo)kado	*!								**
a(bóka)do						*!			**
(ábo)(kado)							*!		
(abó)(kádo)					*!				
☞ (abó)(kádó)								*	

Ito and Mester (2016) further propose subgrammars with slightly different constraint rankings. Notice that reranking the constraints NONFINFT', INIFT, RTMOST and WDACC may produce different results in (4). If INIFT is outranked by the other three, antepenultimacy arises, as in *pa(púri)ka* 'paprika'. If RTMOST is ranked lowest, the outcome is initial accent, as in *(píku)(rusu)* 'pickles'. Ranking NONFINFT' at the bottom can also derive penultimate accent, as in *(derá)(wéa)* 'Delaware (grape)', even though the pattern itself is quite rare. Importantly, the rerankings of these constraints do not affect the results in (3); that is, three-mora words always receive antepenultimate accent.⁵ Thus, these subgrammars altogether account for all the main prosodic patterns in Tokyo Japanese.

3.2 Kyoto Japanese: Deriving tonal melodies

For Kyoto Japanese, I adopt Ito and Mester's (2016) basic analysis, but propose several modifications in order to derive the accent and tonal patterns that are not found in Tokyo Japanese. I first propose the two constraints in (5).

- (5) a. FINALFOOT: A prosodic word ends with a foot; ALIGN-RIGHT(PrWd, Foot)
 b. PARSE(H): High tone must be parsed into a foot

⁴Due to space limitations, I do not give the detailed definitions of all the constraints introduced here. The reader is referred to Ito and Mester (2016).

⁵The rarer patterns LH*L and LHH in (1) must be derived by some lexical specification.

FINALFOOT is a mirror image constraint of INITIALFOOT in Ito and Mester (2016). In the grammar of Kyoto Japanese, the former stands in for the latter. I will show that this constraint plays a role in deriving penultimacy in three-mora words. PARSE(H) requires every high-toned mora to be footed, and is ranked high in the grammar. As will be shown, the high-ranking of this constraint is crucial for deriving the initial tonal registers.⁶

I also make a small modification to the definition of the constraint TROCHEE. Ito and Mester (2016) define trochaic patterns mainly in terms of pitch accent. I argue that TROCHEE is also concerned with tonal melodies. Because high tones are generally more prominent than low tones, a foot containing an LH tonal sequence, i.e. (LH), counts as an iambic foot and violates the constraint. I will show that this version of TROCHEE also contributes to accounting for the data gaps discussed above.

I present in (6) below how this grammar derives the tonal melodies H*LL and LH*L in three-mora words. In this tableau, constraints that may be reranked with respect to each other in different subgrammars are separated by “small-dotted lines” (· · ·), as opposed to “dashed lines” (- - -) that are used to separate constraints of which the rankings are simply undetermined. (NOLAPSE is omitted from the tableau as it is irrelevant.)

(6) Patterns in three-mora words (Kyoto Japanese)

banana ^H	PARSEH	TROCHEE	NONFINσ	FTBIN	NONFINFT'	FINFT	RTMOST	WDACC	PARSEσ
☞ (bána)na						*			*
(baná)na		*!				*			*
bá(nána)	*!				*				*
☞ ba(nána)					*				*
(bána)(na)			*!	*			*		
(bá)(nána)				*!	*				
(bá)(náná)				*!				*	
ba(naná)		*!						*	*

In the main grammar where NONFINFT' outranks FINFT, the winning candidate has antepenultimate accent, as in (sára)da (relative frequency in the data: 77%). However, if the ranking of the two constraints is flipped in another subgrammar, the winner is now the one with penultimate accent, as in ba(nána) (20%). Importantly, the tonal melody is LH*L, and not HH*L bá(nána). I assume that all words in Kyoto Japanese come with underlying high tone, which is indicated by superscripted H in the input.⁷ This high tone is usually linked to the initial mora, which is parsed into a foot, through a tonal assignment procedure. However, in the subgrammar with the ranking FINFT ≫ NONFINFT', a head foot is at the right word edge and the initial mora remains unparsed. Since high tone cannot be realized on a stray mora due to the high-ranking of PARSEH, low tone is inserted and associated to the initial mora instead. Although it is not shown in the tableau here, I assume that DEP(tone), which prohibits tones from being inserted, is ranked relatively low (at least lower than PARSEH and FINFT).⁸

The tableau in (7) below illustrates how the tonal melodies in four-mora words are derived.

⁶I leave for future research to investigate a motivation for this constraint. It is possible that high tone is a kind of prominence and must be assigned through footing just like stress and pitch accent. Importantly, in Ito and Mester's (2016) analysis, this constraint is never violated. Its existence is thus compatible with both Tokyo and Kyoto Japanese.

⁷Given that every word has this high tone, it is possible to posit some high-ranked constraint which demands every word to have H. Here, I specify the tone in the input for simplicity. Also see footnote 10 for discussion on whether this tone should be treated as lexical or phrasal.

⁸I also assume that initial tone may spread to other moras due to some high-ranked constraints on tone spreading.

(7) Patterns in four-mora words (Kyoto Japanese)

abokado ^H	PARSE ^H	TROCHEE	NONFIN σ	FTBIN	NONFINFT'	FINFT	RTMOST	WDACC	PARSE σ
á(bóka)do	*!					*			**
☞ a(bóka)do						*			**
☞ (ábo)(kado)							*		
(ábó)(kádo)					*				
☞ (ábó)(kádó)								*	
(abo)(kadó)		*!						*	

In the main grammar where NONFINFT', FINFT, and RTMOST all outrank WDACC, fully-parsed and unaccented (ábó)(kádó) HHHH (45%) is the winning candidate. The other unaccented candidate (abo)(kadó) with an LLLH tonal melody is ruled out due to a violation of TROCHEE; the final foot containing LH is a dispreferred iambic foot under the definition given above. Ranking FINFT below the other constraints in a subgrammar can derive antepenultimacy, as in pa(púri)ka LH*LL (18%). Again, the tonal melody cannot be HH*LL with initial H; high tone cannot be associated to the initial mora if it is unparsed. If RTMOST is ranked lowest, the result is H*L LL, as in (píku)(rusu) (35%). These subgrammars already produce the three main tonal melodies, which are indicated by the pointing finger ☞. Lastly, if NONFINFT' is outranked by all the other three constraints, the most infrequent pattern HHH*L, as in (dérá)(wéa) (1%), may also be derived.⁹

4 Discussion and conclusion

In this study, I have applied Ito and Mester's (2016) foot-based analysis of accentuation in Tokyo Japanese to the accent and tonal patterns of Kyoto Japanese. The proposed analysis has several advantages over previous work on the prosody of the Kyoto (or Keihan) dialect.

First, I have shown that the so-called initial tonal registers, which are often considered to be properties of the lexicon (see Pierrehumbert and Beckman 1988), can be derived by grammatical principles. My analysis assumes subgrammars with different constraint rankings, and which subgrammar a word is subject to is not entirely predictable. In this sense, some kind of lexically-specific information must be stored in some way or other. However, simply marking each word with either high tone or low tone underlyingly does not explain essentially why the distributions of the tonal registers are restricted to certain environments. Under my analysis, initial high tone cannot appear unless its associated mora is parsed into a foot, thus explaining why there is no H(H*L) or H(H*L)L. Initial low tone is also disfavored if it would create an LH melody within a foot as a result of tone spreading; this explains the lack of (LL)(LH). My analysis thus reveals the structural reasons for the gaps in the tonal patterns in Kyoto Japanese, which have been noted but left virtually unexplained in the literature (see Yoshida and Zamma 2001; Nakai 2002).

Next, this is a first study to extend Ito and Mester's (2016) account of Tokyo Japanese to Kyoto Japanese. The attempt brings new insights into research in dialectology. It is often believed that Tokyo Japanese and Kyoto Japanese constitute one of the major divisions of the Japanese language in terms of prosody (see e.g. NHK Broadcasting Culture Research Institute 1998). Descriptive research on Kyoto (Keihan) Japanese seems to study the dialect independently from Tokyo Japanese, often focusing on classifying the observed tonal melodies of words. As I have shown, however, that the prosodic patterns of the two dialects attested in loanwords are essentially similar, and the system generating those patterns can be given a unified account. Conducting research building on Ito and

⁹The frequency data in (2) suggest that the default ranking is NONFINFT' \gg FINFT \gg RTMOST \gg WDACC. If the variation were to be accounted for by a grammar with constraint weights rather than strict rankings (e.g. MaxEnt HG; Goldwater and Johnson 2003), weights would also be assigned in this order, with the weight of NONFINFT' being by far the highest and that of WDACC the lowest.

Mester's (2016) theory, which has been established with ample evidence from one dialect of Japanese, will further our understanding of the Kyoto dialect of Japanese.

Due to limitations of space, I have only discussed words composed of light syllables. Future research is awaited to extend the analysis developed here to words of other configurations.¹⁰ It is also hoped that this study initiates further investigations into Kyoto Japanese and other dialects of Japanese from theoretical perspectives.

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¹⁰One of the main remaining issues is whether/how to distinguish lexical and phrasal tones. In this study, I treat every tone that is present on the surface as if it is part the word's lexical tonal melody (see e.g. my definition of TROCHEE). However, data suggest that tones occurring at word edges may be phrasal. Although relatively rare, some three-mora words show an LLH tonal pattern, as in the loanword *okurá* LLH 'okra' and the native word *karasú* LLH 'crow'. This melody already poses a challenge to the proposed grammar as it cannot be readily derived. A possible analysis is to posit a foot structure like *(oku)(rá)* (LL)(H) and some high-ranked constraint that can inactivate NONFIN(σ) and FOOTBIN. However, what makes the matter even more complicated is that the final H tone migrates through suffixation, as in *okura-gá* LLLH 'okra-NOM.'. Recall that this LLLH pattern is predicted to be absent as a lexical tonal melody in the proposed grammar, since the expected foot/tonal structure (LL)(LH) is disfavored by high-ranked TROCHEE. It is possible that final H is phrasal and should be treated independently from lexical tones.