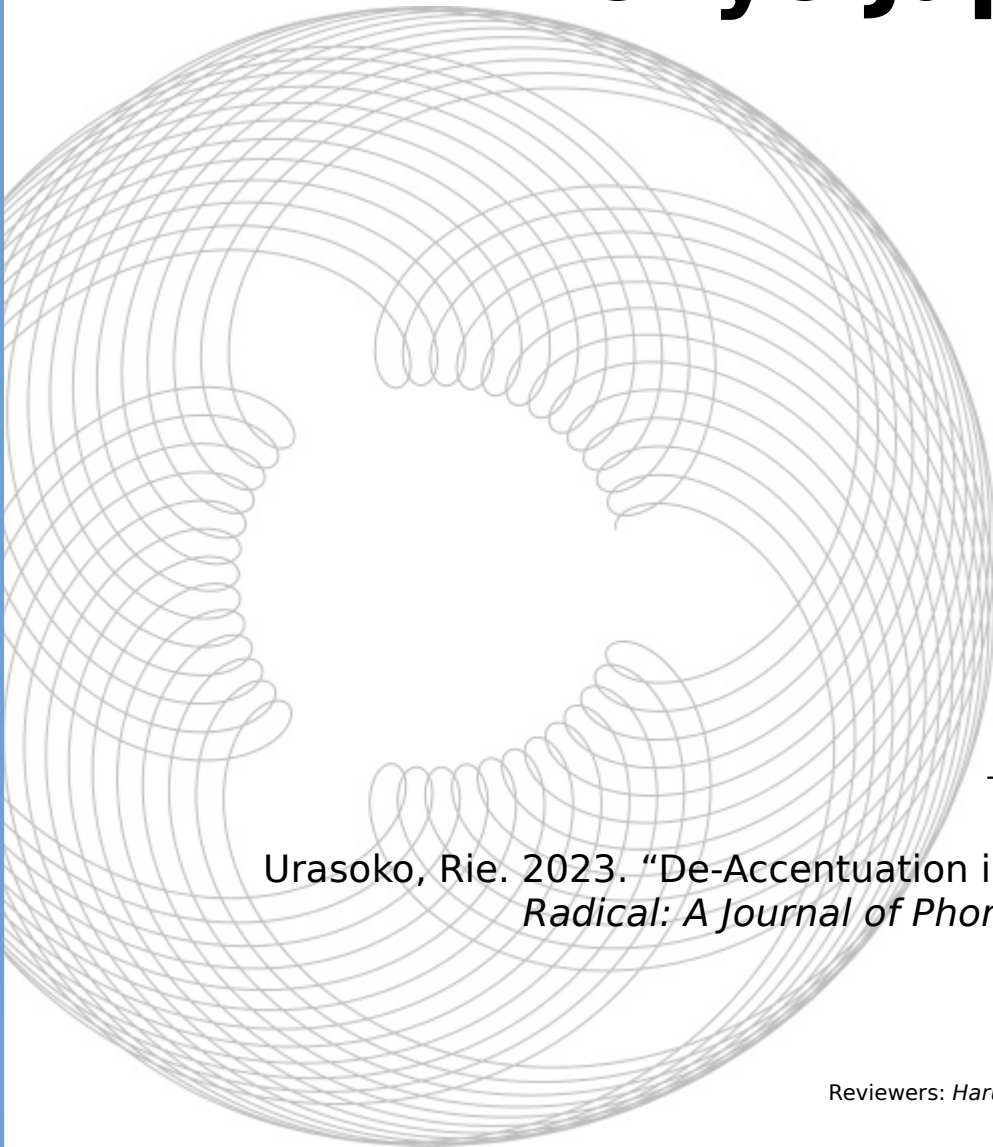


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DE-ACCENTUATION IN TOKYO JAPANESE

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This paper studies the tendency towards de-accentuation in Tokyo Japanese focusing on two factors likely to favor or disfavor de-accentuation: word length and the position of the original accent kernel. The main finding is that de-accentuation is correlated to two factors: higher rates of de-accentuation occur in medium-sized words (especially 4 μ), and when the word is originally accented on the penultimate mora. On the contrary, smaller and bigger word sizes (less than 2 μ and more than 5 μ) and words originally accented on the antepenultimate mora are more likely to go against the tendency of de-accentuation.

Tokyo Japanese, Pitch Accent, De-Accentuation, Antepenultimate, Unaccentedness

INTRODUCTION

This paper examines and describes the phenomenon of de-accentuation in Tokyo Japanese (henceforth, “Japanese” for short) nouns. The purpose is to examine the phonological criteria that favor this phenomenon, focusing on two factors: word length and the original accent kernel position. This research is based on dictionary data extracted from two different editions of the dictionary of pronunciation and accent (1998 and 2016) as well as comments by the publisher (NHK Broadcasting Culture Research Institute).

The organization of this paper is as follows. Section 1 provides basic information

concerning the Japanese pitch accent system and the phenomenon of de-accentuation and presents the research questions of this paper. Previous studies on favorable environments for unaccentedness and de-accentuation, and the aim of this paper are also explained. In Section 2, two main factors of de-accentuation are studied: word length and the position of the original accent kernel. This will be done by providing statistical descriptive analysis of de-accented words. The main findings are discussed in Section 3. The conclusion summarizes the main findings of this study and mentions further research questions.

1 TOKYO JAPANESE PITCH ACCENT AND THE DE-ACCENTUATION

1.1 ACCENT IN TOKYO JAPANESE

Japanese has often been cited as a prototypical pitch accent language in phonological typology research, although Hyman (2006) questions the existence of pitch accent languages as such due to a lack of coherent conditions defining this term. The fact remains nevertheless that most traditional phonological studies consider Japanese as a pitch accent language. A stress accent (as observed for instance in English) is determined by the force on the accented syllable, which can be pronounced longer and/or with higher pitch than the surrounding syllables. On the other hand, there is no increase in intensity in Japanese. The prominence of a pitch accent is determined by the difference in pitch height. The distinctive lexical pitch accent is marked phonetically by the sequence from high pitched mora (henceforth H) to low pitched mora (henceforth L). This accent is located on the last H pitched mora immediately before the tonal dropping towards L pitched mora, which is called “accent kernel”¹. Thus, only the tonal fall (HL) marks a placement of lexical accent (if there is one).

¹ “Accent kernel”, called “*akusento kaku*” in Japanese terminology, is generally used when a specific accent position is concerned, namely the mora bearing the accent which represents HL tonal drop is said to have the accent kernel.

The Japanese lexicon is divided into two accentual patterns: accented and unaccented. As we mentioned previously, the former pattern has a falling pitch per word which is a prosodic peak represented by the HL sequence, whereas the latter does not. Thus, the following examples in (1) show four patterns of 3 μ length nouns (accented mora and HL sequence is noted in bold and a superscript circle follows an unaccented form):

- | | | | | |
|-----|----|------------------------|-----------------------|---------------|
| (1) | a. | midori -ga | “green-ga (particle)” | HLL -L |
| | b. | tamago -ga | “egg” | LHL -L |
| | c. | otoko -ga | “man” | LHH -L |
| | d. | sakura-ga ^o | “cherry blossom” | LHH-H |

The accent kernel can be located on any mora. (1) a. is accentuated on the first mora *mi*, b. on the penultimate mora *ma*, and c. on the final mora *ko*. We can see that there is only one HL sequence per word in a., b. and c. Concerning d. which has an unaccented pattern, the pitch starts low and goes up to the second mora until the end of the word including the attached particle *ga*. The absence of an HL sequence therefore means an absence of accent.

Accent locations are predictable in certain categories of nouns. The assignment of an accent in compound words for instance is governed by specific and established rules and the compound accent (henceforth CA) is determined by the nature (the length and the position of accent) of the second component (henceforth C2) (Kubozono 1995, Kubozono & Tanaka 1995, Tanaka, 2001, McCawley, 1968 among others). Three CA possible patterns (in case of short C2 (less than 3 μ)) are noted: a) default type (CA is at the final mora of C1, ex. **ningyo** + **hime** = **ningyohime** “Little Mermaid”), b) accent of C2 maintained (ex. **perusya** + **neko** = **perusyaneko** “Persian cat”), c) atonic type: CA is atonic (often happens when C2 is accented on the final mora, ex. ex. nezumi^o + **iro** = nezumi^oiro^o “gray color”) (Kubozono & Tanaka 1999). According to the authors, the most productive case

concerns the default case (a) in which CA falls on the antepenultimate mora, while the fewest cases concern (b) in which CA falls on the penultimate mora. In addition, as one of the reviewers pointed out, the “default accent” is also predictable in Japanese, especially in some lexical items such as loanwords and proper nouns where the antepenultimate accent position is considered as a default accent position (ex. *supaiku* “spike”, *terebi* “television”, *Kitano* “Mr./Mrs. Kitano”, *Kanagawa* “Kanagawa prefecture” etc.). Moreover, accent locations are predictable according to the moraic/syllable forms. When the antepenultimate position is occupied by a deficient mora² (namely heavy syllable) in loanwords, the accent location shifts to the pre antepenultimate mora (ex. when the antepenultimate mora is a geminated consonant /Q/ (ex. *de.ra.Q.ku.su* “deluxe”), moraic nasal /N/ (ex. *a.ru.ze.N.ti.N* “Argentina”), or a second part of long vowel /R/ (ex. *suweRdeN* “Sweden”).

In addition, the Japanese accent schema is governed by the following two principles:

- (2) “*HLH, or Adjacency Principle: two high pitches (H) on the surface can cohabit in a word only if they are adjacent. That is, several H’s cannot be separated by one or more L’s. There is thus only one high plateau in a word. Here accent fulfills a culminative function.” (Labrune 2012:180)
- “*#HH and *#LL, or Initial Dissimilation Principle (also known as initial lowering): the first and second moras in a word always have different heights. A word thus starts obligatorily, either by HL if the first mora of the word carries the accent, or by LH in all other cases. (...)” (Labrune 2012:180)

² We generally distinguish three types of deficient moras (terminology cited by Labrune 2012): the first part of geminate (represented by /Q/), moraic nasal (/N/), the second part of a long vowel (/R/). Sometimes the second part of successive vowel represented by /J/, such as *aizu* “sign” is also considered to be a deficient mora.

Note that words beginning with a heavy syllable are often described as not necessarily undergoing the second principle (Initial Dissimilation Principle). Among nouns, the proportion of accented and unaccented words is divided more or less equally in half. In dictionary data (around 68,000 words, Sakamoto 1999), 53 % of the nominal lexicon is accented and 47 % is unaccented. The fact that nearly half of the nouns belong to the unaccented pattern is noteworthy, considering unaccented words are not necessarily present in other pitch accent languages (Itō & Mester 2016). They are even not found in stress accent languages such as English (Hyman 2006).

We can observe an intriguing accent phenomenon related to unaccentedness in Japanese: the phenomenon of de-accentuation, or the tendency to transform originally accented nouns into unaccented ones. In other words, de-accentuation means pronouncing an originally accented word as unaccented. An example of the process of de-accentuation is shown in (3).

(3)	<i>amagutu</i>	→	<i>amagutu</i> ^o	“rain boots”
	LHLL		LHHH	

We observe that more and more initially accented words tend to be pronounced as unaccented in contemporary Japanese. The aim of this research is to uncover the factors that favor or disfavor de-accentuation.

1.2 PREVIOUS STUDIES IN DE-ACCENTUATION

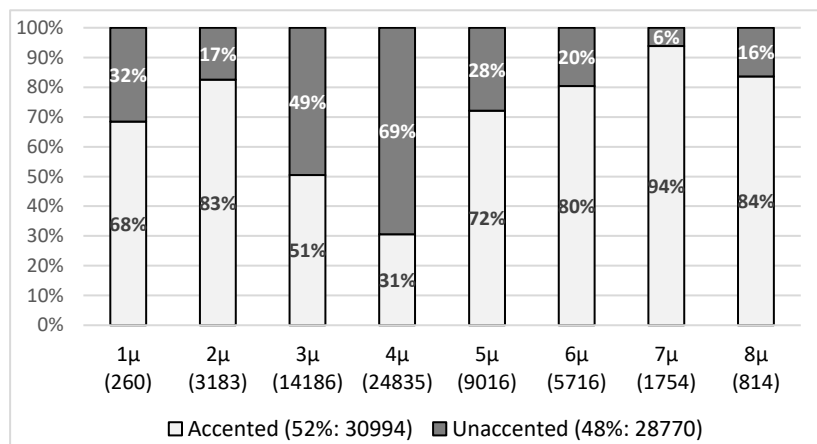
A number of previous studies have discussed the environments favoring unaccentedness as well as the process of de-accentuation. Unaccentedness can be considered from different points of view, such as phonological, morphological, semantics or sociolinguistic (Kubozono 1995, 2006, Giriko 2009, Labrune 2012, Itō & Mester 2016, Shioda 2016a, 2016b, 2017 etc.). We will outline below some of the phonological factors discussed by the

authors cited here.

According to Kubozono (2006), the presence of the unaccented pattern depends on word length and the phonological structure of the end of the word. Kubozono showed that loanwords are significantly more likely to be unaccented when the word length is 4 μ and when the word ends by a series of light syllables (CVCV) without epenthetic vowels. Furthermore, a study (Itō & Mester 2016) within the framework of the Optimality Theory (henceforth OT, Prince & Smolensky 1993/2004) reports that the unaccented pattern is related to the foot structure of the entire word rather than simply to the word length itself.

Word length is thus one of the well-known factors that favor the emergence of unaccentedness. The dominance of unaccentedness is observed in 4 μ length words in the Japanese nominal lexicon. As can be observed in Figure (4), compared to other lengths, a large proportion (i.e. almost 70 %) of 4 μ words are unaccented. Moreover, this fact is true not only in the native stratum but also in Sino-Japanese (henceforth *SJ*) and western loanword strata (henceforth *loanwords*).

(4) PROPORTION OF ACCENTED & UNACCENTED WORDS IN THE LEXICON SORTED BY WORD LENGTH (SAKAMOTO 1999)



Furthermore, since the accent kernel can be placed at the initial, middle or final mora, one

could naturally ask which of those accented patterns is most likely to be de-accented. To the best of our knowledge, and especially when compared to studies on word length related to unaccentedness, studies focusing on the original accent type of de-accented words are quite rare, although not inexistant.

For instance, Akinaga (1957) mentions some final accented (bi- or tri- moraic) words such as *kita* “north”, *higasi* “east”, *hayasi* “forest” etc., which are noticeably undergoing de-accentuation at the time of her description. Aizawa (1996) analyzes the link between word length and the progress of accent change in Tokyo dialect nouns, and explores the disappearance of final accented patterns. The main finding is that the longer the word (within 3 μ -5 μ), the more the final accented pattern drops. Moreover, a negative correlation is observed between unaccentedness and the final accented patterns. In addition, Hattori (1998) conducted a study of accent changes in nouns based on accent dictionary data. She listed more than 500 examples of accent changes by comparing two dictionaries³ published respectively in 1893 and 1985. The main result shows that there are two canonical models as the target for accent shift: 73 % relates to de-accentuation and 20 % relates to a shift towards the antepenultimate pattern. It should be noted that the change towards the antepenultimate accent is also considered canonical, this type corresponding to the default accent of Japanese (Martin 1952, McCawley 1968, Shinohara 2000, Kubozono 2006 etc.). According to these studies, the final accent pattern is likely to disappear in favor of unaccented or antepenultimate patterns.

Other phonological factors have also been uncovered in our recent works (Urasoko 2020, 2021). The correlation between original accent type and de-accentuation has been analyzed according to three different strata, based on dictionary data from two editions of the NHK accent and pronunciation dictionary (from 1998 & 2016, respectively). To sum up the results, the penultimate pattern in native strata, the final pattern in SJ and the pre-

³ Yamada, Bimyō. (1893). *Nippon dai jisho* [Grand dictionary of Japanese]. NHK (Ed.). (1985). *Nihongo hatsuon akusento jiten* [Dictionary of Japanese pronunciation and accent]

antepenultimate pattern in loanwords strongly tend to be de-accented. A tendency of resistance in antepenultimate patterns is also observed in these three strata.

We would also like to point out another reference studying accent pattern change. *Shin-meikai Japanese Accent Dictionary (Shin Meikai Nihongo Akusento Jiten, 2014)* proposes in its appendix a description of the accent shifts that have taken place, or are in progress, in Japanese. The description of accent change tendency direction in each word length (1 μ to 6 μ words) is summed up in the Table (5).

(5) ACCENT CHANGE DIRECTION IN EACH WORD LENGTH (1 μ TO 6 μ)

	Accent change direction	
	<i>From</i>	<i>To</i>
1 μ	0	initial
2 μ	-1	0
		-2 (initial)
3 μ	-1	0
		-3 (initial)
	-2	-3 (initial)
4 μ	-4 (initial)	0
		-3
	-3	0
5 μ	-5 (initial)	-3
	-1	-3
		0
	other patterns	-3
6 μ	-6 (initial)	-3
		-4
	other patterns	-3
	-3	-4

As one of the reviewers pointed out, and as we can observe in the above table, the antepenultimate pattern seems to be a stable pattern appearing regularly in the case “To”, to which other patterns are changing, especially in case of 3 μ , 4 μ , 5 μ and 6 μ words. We also note that the penultimate (-2) pattern is likely to change to the antepenultimate (-3)

pattern in 3 μ length. Concerning de-accentuation, words originally accented on the final (-1) position in 2 μ , 3 μ and 5 μ length are affected, while some 4 μ length originally accented with pre antepenultimate (-4, i.e. initial) and antepenultimate (-3) patterns are prone to losing their lexical accent.

In the appendix of the NHK Accent Dictionary (*Nihongo Hatsuon Akusento Shin Jiten*, 2016), a summary of the accent pattern tendency is also proposed, according to the lexical stratum, the length and the morphological form. The unaccented pattern is generally observed in the 3 μ SJ words, when the signification is verbal and their morphological structure is “XX + X” (ex. *insyu* “drinking”, *syokuzi* “meal”), and in the 4 μ SJ words in the form “XX+XX” used in a verbal sense (ex. *gakusyuu* “learning”, *suiei* “swimming”). The appendix also mentions that the unaccented pattern is observed exceptionally in some 3 μ loanwords (ex. *karee* “curry”, *koppu* “glass”), the strata which generally tends to have an accented pattern. It is also noted that the 4 μ loanwords with only light syllable (ex. *adoribu* “ad-lib”, *apareru* “apparel”) are also likely to be unaccented, while words with 5 μ length or more tend to bear the accent on the antepenultimate mora.

2 FACTORS BEARING ON DE-ACCENTUATION IN TOKYO JAPANESE

The aim of this paper is to answer the following questions: which length (1 μ , 2 μ , 3 μ , etc.) is the most likely to undergo de-accentuation? What role does the location of the original accent play in this process? In order to answer these questions, in this section, de-accented words sorted by word length (2.1) and by the original accent type (2.2) will be examined. The location of original accent kernel related to the word length (2.3) will also be studied.

2.1 WORD LENGTH

The distribution of the 508 de-accented words⁴ sorted by word length (1 μ -8 μ) is shown

⁴ The publisher (NHK Broadcasting Culture Research Institute) of the Pronunciation and Accent Dictionary,

in Table (6). We observe the dominance of 4 μ (45 %) followed by 3 μ (30 %) and 5 μ (16 %). The other lengths (1 μ , 2 μ , 6 μ , 7 μ , 8 μ) are clearly less affected by de-accentuation. In other words, the medium word size (4 μ and 3 μ in this order) is the most affected by de-accentuation whereas the small (1 μ , 2 μ) as well as large (5 μ and more) sized words are far less de-accented in absolute figures. We categorize henceforth word length by three distinct sizes: small (1 μ , 2 μ), medium (3 μ , 4 μ), large (5 μ and more).

(6) 508 DE-ACCENTED NOMINAL WORDS DISTRIBUTION SORTED BY WORD LENGTH

Nominal Word Length	De-accented Nominal Words	
1 μ	0	0 %
2 μ	11	2 %
3 μ	152	30 %
4μ	228	45 %
5 μ	81	16 %
6 μ	34	7 %
7 μ	1	0,20 %
8 μ	1	0,20 %
total	508	100 %

We will now compare the proportion of each word length in the general lexicon (nominal words) vs. our corpus (de-accented nominal words). In Table (7), the distribution of general lexicon (nominal words)⁵ and the distribution of de-accented nominal words (both sorted by word length) are shown. The dominant proportion concerns 4 μ length for both (25 % for general lexicon and 45 % for de-accented words). However, in terms of comparison of word length proportion, we can observe that the proportions of 4 μ words (from 25 % to 45 %) and 3 μ words (from 23 % to 30 %) are increasing (Table 7). This

in collaboration with a team of linguists, conducted four accentuation surveys of about 5500 words over a period of 7 years among 1200 announcers. Accent change was found on about 3300 words. Our corpus is extracted from the second survey (2009) and we were able to list 508 words among the 1155 that were de-accented between the two editions of the dictionary in 1998 and in 2016 (Shioda, 2016a, 2016b, 2017).

⁵ In order to compare de-accented words - which by definition were accented before - to accented nominal words - which include both accented and unaccented words - the unaccented words in the general lexicon (Sakamoto 1999) have been removed beforehand.

means that 3 μ and 4 μ length are most likely to undergo de-accentuation. The rates of de-accentuation⁶ of these lengths are higher overall (Table 8). These data are shown to be significant by using a statistical chi-square test (4 μ : χ^2 (1) = 113.974, $p < .05$), 3 μ : χ^2 (1) = 13.162, $p < .05$). The proportions of the other lengths are all decreasing and these are also statistically significant (except for 1 μ for which the statistical calculation could not be carried out because of insufficient occurrence). This result confirms that in terms of de-accentuation rates as well, the medium word size (4 μ and 3 μ in this order) is strongly de-accented while the small and large sizes are resistant to de-accentuation.

(7) COMPARISON OF WORD LENGTH PROPORTION: GENERAL LEXICON (NOMINAL WORDS)⁷ vs. DE-ACCENTED NOMINAL WORDS

	General Lexicon (nominal words)		De-accented Nominal Words	
1 μ	178	1 %	0	0 %
2 μ	2628	8 %	11	2 %
3 μ	7170	23 %	152	30 %
4 μ	7596	25 %	228	45 %
5 μ	6499	21 %	81	16 %
6 μ	4596	15 %	34	7 %
7 μ	1646	5 %	1	0,20 %
8 μ	681	2 %	1	0,20 %
Total	30994	100 %	508	100 %

⁶ The rate of de-accentuation is obtained by the following calculation: the number of de-accented words, divided by the number of general lexicon (nominal words).

⁷ Sakamoto (1999), based on NHK Accent Dictionary of 1998 edition.

(8) RATES OF DE-ACCENTUATION RELATED TO WORD LENGTH

Rate of De-accented Words		
1μ	0,00 %	(0/178)
2μ	0,40 %	(11/2628)
3μ	2,10 %	(152/7170)
4μ	3,00 %	(228/7596)
5μ	1,20 %	(81/6499)
6μ	0,70 %	(34/4596)
7μ	0,10 %	(1/1646)
8μ	0,10 %	(1/681)
Total	1,60 %	(508/30994)

2.2 LOCATION OF ORIGINAL ACCENT KERNEL

In Table (9), the distribution of the 508 de-accented words sorted by position of the original accent (from -1 to -7) is shown. The initial accent type is presented separately because the numbers in this type are all overlapping (ex. 3μ words originally accented on the antepenultimate position are listed in both “-3” and “initial”. The same is true for other lengths).

(9) 508 DE-ACCENTED WORDS DISTRIBUTION SORTED BY POSITION OF ORIGINAL ACCENT

Position of original accent	De-accented nominal words	
-1 (final)	51	10 %
-2 (penultimate)	123	24 %
-3 (antepenultimate)	231	45 %
-4 (pre-antepenultimate)	95	19 %
-5	7	1 %
-6	1	0 %
-7	0	0 %
Total	508	100 %
initial	161	32 %

We observe the dominance of the -3 types (45 %) followed by the initial (32 %). Then

come -2 (24 %), -4 (19 %). The proportion falls for the -1 types (10 %) and as for the -5, -6, -7, they are clearly less affected scoring less than 2 %.

In a similar way as for the factor word length, we will now examine the rates of de-accentuation sorted by the original accent position. In order to obtain these rates, the distribution by original accent position of the 508 de-accented words is compared to the accent distribution of the general lexicon (nominal words), as we have done in the case of word length. The data is shown below (10,11).

In Table 10, we can observe that the -3 proportion is decreasing (from 51 % to 45 %) while the -2 proportion is increasing (from 19 % to 24 %). These rates are statistically significant (-3: $\chi^2(1) = 6.431$, $p < .05$, -2: $\chi^2(1) = 10.366$, $p < .05$) while the other rates are not.⁸ This result asserts that words originally accented on the penultimate position are strongly de-accented, and that words originally accented on the antepenultimate position are resistant to de-accentuation. This last fact is important to note since the antepenultimate type is the most affected type in absolute numbers (as we observed previously in Table 9).

(10) COMPARISON OF ACCENT POSITION: GENERAL LEXICON (NOMINAL WORDS)⁹ VS. DE-ACCENTED NOMINAL WORDS

	General Lexicon (nominal words)		De-accented nominal Words	
-1	2621	9 %	51	10 %
-2	5653	19 %	123	24 %
-3	15489	51 %	231	45 %
-4	5916	20 %	95	19 %
-5	396	1 %	7	1 %
-6	138	0 %	1	0 %
-7	100	0 %	0	0 %
Total	30313	100 %	508	100 %
Initial	10428	34 %	161	32 %

⁸ Table 11: the higher rate of -2 is highlighted in gray and the lower rate of -3 is circled.

⁹ Sakamoto (1999), based on NHK Accent Dictionary of 1998 edition.

(11) RATES OF DE-ACCENTUATION RELATED TO THE ORIGINAL ACCENT POSITION

Rate of De-accented Words		
-1	1,95 %	(51/2621)
-2	2,18 %	(123/5653)
-3	1,49 %	(231/15489)
-4	1,61 %	(95/5916)
-5	1,77 %	(7/396)
-6	0,72 %	(1/138)
-7	0,00 %	(0/100)
Total	1,68 %	(508/30313)
Initial	1,54 %	(161/10428)

Some examples of de-accented words for each accent pattern according to the lexical strata are shown in Table (12) below.

(12) DE-ACCENTED WORDS FOR EACH ORIGINAL ACCENT PATTERN IN THE THREE LEXICAL STRATA

	Native	SJ	Loanwords
-1	<i>yuaka</i> “scale”, <i>mizukumi</i> “water pump”	<i>kiku</i> “chrysanthemum”, <i>saiku</i> “workmanship”	
-2	<i>iwai</i> “celebration”, <i>higesori</i> “razor”	<i>Nou</i> “Nō play”, <i>hukai</i> “displeasure”, <i>kongen</i> “root”	<i>gyara</i> “performance fee”, <i>pizapai</i> “pizza pie”
-3	<i>kokabu</i> “small turnip”, <i>sobakiri</i> “buckwheat noodle”, <i>amagumori</i> “rain cloud”	<i>goui</i> “agreement”, <i>sekaisi</i> “world history”, <i>yuutusyou</i> “depression”	<i>raberu</i> “label”, <i>deforume</i> “deformation”, <i>antyobii</i> “anchovy”
-4	<i>maeasi</i> “forefoot”, <i>hitowatari</i> “all over”, <i>tomobataraki</i> “double-income”	<i>geitou</i> “performance”, <i>himansyou</i> “obesity”, <i>tennousei</i> “Uranus”	<i>bizyuaru</i> “visual”, <i>adaputaa</i> “adapter”
-5			<i>kyarakutaa</i> “character”, <i>hurooringu</i> “flooring”
-6	<i>todonotumari</i> “finally”		

2.3 LOCATION OF ORIGINAL ACCENT KERNEL IN RELATION TO WORD LENGTH

Finally, we would like to cross the two criteria of word length and position of original

accent kernel (Table 13). The dominant type is highlighted in gray for each length.

(13) LOCALIZATION OF ORIGINAL ACCENT KERNEL IN RELATION TO WORD LENGTH IN THE 508 DE-ACCENTED NOMINAL WORDS

	2 μ		3 μ		4 μ		5 μ		6 μ		7 μ		8 μ		Total	
<i>Original accent type</i>	-1	2 18%	25 16%	22 10%	0	2 6%	0	0	0	0	0	0	0	0	51 10%	10%
	-2	9 82%	25 16%	83 36%	6 7%	0	0	0	0	0	0	0	0	0	123 24%	24%
	-3		102 67%	77 34%	42 52%	8 24%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	1 100%	231 46%	46%
	-4			46 20%	30 37%	19 56%	0	0	0	0	0	0	0	0	95 19%	19%
	-5				3 4%	4 12%	0	0	0	0	0	0	0	0	7 1%	1%
	-6						1 3%	0	0	0	0	0	0	0	1 0,20%	0,20%
	Total	11 2%	152 30%	228 45%	81 16%	34 7%	1 0,20%	1 0,20%	1 0,20%	1 0,20%	1 0,20%	1 0,20%	1 0,20%	1 0,20%	508 100%	100%
Initial	9 82%	102 67%	46 20%	3 4%	1 3%	0	0	0	0	0	0	0	0	161 32%	32%	

We can observe that the initial type is dominant in 2 μ (82 %) and 3 μ (67 %). The proportion of this initial type decreases considerably in 4 μ (20 %) and even more so in 5 μ or more (less than 5 %). We also note that the -2, -3 and -4 types are dominant in the 4, 5 and 6 μ lengths respectively. Additionally, the 4 μ originally accented on the -3 position and the 5 μ originally accented on the -4 position occupy a significant place for each length.

Table (14) shows the proportion and number of de-accented words according to the two criteria.

(14) COMPARISON OF ACCENT POSITION ACCORDING TO EACH LENGTH (2 μ -6 μ): GENERAL LEXICON (NOMINAL WORDS)¹⁰ VS. DE-ACCENTED NOMINAL WORDS AND RATES OF DE-ACCENTUATION RELATED TO THE ORIGINAL ACCENT POSITION

	General Lexicon (nominal words)		De-accented Nominal Words		Rate of De-accented Words	
2μ						
-1	559	21 %	2	18 %	0,36 %	(2 / 559)
-2	2 069	79 %	9	82 %	0,43 %	(9 / 2 069)
Total	2 628	100 %	11	100 %	0,42 %	(11 / 2 628)
3μ						
-1	822	11 %	25	16 %	3,04 %	(25 / 822)
-2	838	12 %	25	16 %	2,98 %	(25 / 838)
-3	5 510	77 %	102	67 %	1,85 %	(102 / 5 510)
Total	7 170	100 %	152	100 %	2,12 %	(152 / 7 170)
4μ						
-1	755	10 %	22	10 %	2,91 %	(22 / 755)
-2	1 792	24 %	83	36 %	4,63 %	(83 / 1 792)
-3	2 885	38 %	77	34 %	2,67 %	(77 / 2 885)
-4	2 164	28 %	46	20 %	2,13 %	(46 / 2 164)
Total	7 596	100 %	228	100 %	3,00 %	(228 / 7 596)
5μ						
-1	258	4 %	0	0 %	0,00 %	(0/258)
-2	556	9 %	6	7 %	1,08 %	(6/556)
-3	4 281	66 %	42	52 %	0,98 %	(42/4 281)
-4	1 114	17 %	30	37 %	2,69 %	(30/1 114)
-5	290	4 %	3	4 %	1,03 %	(3 / 290)
Total	6 499	100 %	81	100 %	1,25 %	(81 / 6 499)
6μ						
-1	45	1 %	2	6 %	4,44 %	(2 / 45)
-2	289	6 %	0	0 %	0,00 %	(0 / 289)
-3	1 882	41 %	8	24 %	0,43 %	(8 / 1 882)
-4	2 186	48 %	19	56 %	0,87 %	(19 / 2 186)
-5	77	2 %	4	12 %	5,19 %	(4 / 77)
-6	117	3 %	1	3 %	0,85 %	(1 / 117)
Total	4 596	100 %	34	100 %	0,74 %	(34 / 4 596)

In order to understand what exactly these numbers and proportions indicate in terms of accent change in the lexicon, we again compared the distribution of the general lexicon to that of de-accented words according to each word length (2 μ -6 μ).¹¹ Concerning the

¹⁰ Sakamoto (1999), based on NHK Accent Dictionary of 1998 edition.

¹¹ We highlighted statistically significant figures: statistically confirmed higher rates of de-accentuation are

penultimate position, its increasing proportion of de-accented nouns with respect to the general lexicon is observed in 4 μ length (from 24 % to 36 %) and 3 μ length (from 12 % to 16 %). While the rise of 4 μ length is statistically significant ($\chi^2(1) = 20.763, p < .05$), the rise of 3 μ length shows only a trend ($\chi^2(1) = 3.336, p = .068$). This means that the penultimate factor favoring de-accentuation emanates mainly from 4 μ length. Concerning the antepenultimate position, its decreasing proportion of de-accented nouns with respect to the general lexicon is observed in 3 μ (from 77 % to 7 %), 4 μ (from 38 % to 34 %), 5 μ (from 66 % to 52 %) and 6 μ (from 41 % to 24 %). This dropping rate is statistically significant only for 3 μ , 5 μ and 6 μ length (3 μ : $\chi^2(1) = 8.109, p < .05$, 5 μ : $\chi^2(1) = 7.082, p < .05$, 6 μ : $\chi^2(1) = 4.266, p < .05$), while the rate of 4 μ length is not statistically significant ($\chi^2(1) = 1.714, p = .190$). This means that the resistance of the antepenultimate pattern to the de-accentuation emanates mainly from 3 μ , 5 μ and 6 μ length. We also note the decreasing proportion of -4 of 4 μ (i.e. initial pattern) (from 28 % to 20 %) as well as the increasing proportion of -4 of 5 μ (from 17 % to 37 %). These two rates are both statistically significant (4 μ : $\chi^2(1) = 7.734, p < .05$, 5 μ : $\chi^2(1) = 22.575, p < .05$). This tells us that words originally accented on the pre antepenultimate position resist the de-accentuation in 4 μ length while they tend to be de-accented in 5 μ length words.

Indeed, we can sum up the main results that the high rate of -2 that we obtained in the previous comparison (Table 10, 11) is mainly due to the 4 μ length (also observed in Table 5).¹² However, it is also important to note the decreasing rate of the antepenultimate position, i.e., its resistance to de-accentuation regardless of the word length (3, 4, 5, 6 μ). We

highlighted in gray. Statistically confirmed lower rates are circled.

¹² One of the reviewers pointed out that if this interpretation is correct, the factor -2 is basically an epiphenomenon that could be attributed to the fact that many 4 μ words originally accented on -2 became unaccented. And this would imply that -2 accent would not be a major factor but a relatively minor factor for de-accenting. We argue that the proportion of -2 in 4 μ length words is higher in the de-accented words than in the general lexicon (and the proportion of -3 lower). The -2 pattern was showed being more favorable to the de-accentuation than other patterns, while the antepenultimate pattern is showed being resistant to the de-accentuation. Since these data were statistically significant, if the idea of antepenultimate resistance to the de-accentuation is a correct interpretation in this comparison work, the penultimate position factor which is most likely to undergo this phenomenon is also correct.

can summarize the result obtained as follows:

- Word length is correlated to de-accentuation: 4 μ and 3 μ , in this order, are largely affected while other lengths are not.
- The position of the original accent kernel correlates with the rate of de-accentuation: the penultimate is the most sensitive position to de-accentuation while the antepenultimate pattern is robust resisting de-accentuation.
- The type of original accent in de-accented words varies with word length: the final (3 μ), penultimate (3, 4 μ), and pre-antepenultimate (5, 6 μ) patterns are strongly de-accented while the antepenultimate pattern remains robust regardless of word size (3 μ -6 μ)
- In terms of the phenomenon of de-accentuation, word lengths can be classified as follows; the medium-sized words (3, 4 μ) exhibit exceptional behavior, while other word sizes, namely small (1, 2 μ) and large (5 μ and more), do not.

3 DISCUSSION

3.1 FAVORING FACTORS

Based upon the result obtained in the previous section, we would like to discuss further the favoring factors of de-accentuation. The main issue here is relative to the length of the words and the type of original accent that favor de-accentuation, namely i) medium-sized words (especially 4 μ) and ii) words originally accented on the penultimate mora. We shall ask two questions:

First, why are medium-sized words (4 μ and 3 μ in this order) the most affected by de-accentuation? The strong tendency towards de-accentuation in the 4 μ observed in this paper corresponds to findings in previous studies. We can see in Table (4) that the medium length is the most representative length of the Japanese nominal lexicon: 42 % (24 835/59 764) for 4 μ and 24 % (14 186/59 764) for 3 μ . Tanaka (2008) provides an interesting remark about the perception of word size and the attribution of accents. According to this author, the most basic length (4 μ) can be considered as an unmarked size in

the Japanese lexicon and de-accentuation does not mean the loss of accent function. Tanaka argues that the “basic size” of the word (4μ) is enough as an indication to identify a word, regardless of accentuation. Hence, de-accentuation can occur massively in 4μ without losing the accent (culminative and demarcative) functions of word recognition.¹³ The idea that word size plays a role in de-accentuation is indeed consistent with Tanaka’s claim.

Second, why is the penultimate pattern the most affected by de-accentuation? It is important to note that a great number of words (56 %, see below Table 15) originally accented on the penultimate position have an identical morphological structure, especially the words consisting of only light syllables (43 %): XX + XX¹⁴ (ex. *higesori* “razor” consisting of *hige* + *sori* “mustache + shaving”). The statistical data is shown in Table 15.

¹³ An interesting query from one of the reviewers about recognition of 4μ length is worth mentioning. Understanding Tanaka’s claim (2008) as the recognition of a noun by a listener when he hears four successive high tones, the reviewer is wondering whether 4μ length can still help to recognize a word boundary in the case of longer words without pitch before the fifth mora (ex. *chuukajinminkyowakoku* “People’s Republic of China”). We can say that a long length noun, as in the mentioned example, consists generally of more than two nouns and in such a case, two moras can bear the accent or a slight pause can also mark the boundary inside of compound noun.

¹⁴ “X” represents a mora.

(15) 123 DE-ACCENTED WORDS ORIGINALLY ACCENTED ON THE PENULTIMATE MORA SORTED BY MORA/SYLLABLE STRUCTURE AND MORPHOLOGICAL STRUCTURE (2 μ -6 μ)

	Mora (Syllable) structure ¹⁵	Morphological structure ¹⁶	De-accented words originally accented on the penultimate (-2) mora	
2 μ	MM (LL)	0	3	2 %
		1+1	1	1 %
	Mm (H)	0	5	4 %
3 μ	MMM (LLL)	0	1	1 %
		1+2	9	7 %
		2+1	12	10 %
	Mm (LH)	1+2	3	2 %
4 μ	MMMM (LLLL)	0	7	6 %
		2+1+1	1	1 %
		2+2	53	43 %
		3+1	6	5 %
	MmMM (HLL)	2+2	5	4 %
	MMMm (LLH)	2+2	1	1 %
	MmMm (HH)	2+2	10	8 %
5 μ	MMMMM (LLLLL)	4+1	3	2 %
		3+2	2	2 %
	MmMMM (HLLL)	4+1	1	1 %
6 μ			0	0 %
Total			123	100 %

According to some of our previous research, which we do not mention in detail here due to a lack of space, most of this profile favoring de-accentuation (MMMM(LLLL), 2+2, originally accented on the penultimate) comes from the native lexical stratum.¹⁷ We can say that the originally accented on the penultimate position factor is a key factor for

¹⁵ M: full mora (CV, V, CyV), m: deficient mora (/R/, /N/ or /Q), L: light syllable, H: heavy syllable

¹⁶ “0” means without morphological boundary, “+” marks the morphological boundary, “1+1” means “X+X”, “2+2” means “XX+XX” and so on.

¹⁷ In addition, the semantic structure of these native words is mostly divided into the three following forms; i) native noun + native noun (ex. *namakizu* “cuts and bruises” consisting of *nama* “sraw” + *kizu* “injury”), ii) native noun + native noun derived from verb (ex. *hudetate* “brush stand” consisting of *hude* “brush” + *tateru* (v.) “stand”), iii) noun delivered from verb + native noun (ex. *tabekasu* “remains left after a meal” consisting of *taberu* (v.) “eat” + *kasu* “scraps”).

de-accentuation mainly in the case of 4 μ native words consisting of only light syllable and having a morphological boundary in the middle of the word. Concerning 3 μ words, in the literature, it was noted that the penultimate pattern tends to change to the antepenultimate pattern. According to our research whose detail is neither mentioned because of a lack of space, the penultimate position is not responsible of de-accentuation of this length. However, we observed that the final position in native words and the antepenultimate position in SJ words are likely to be de-accented, when compared with the proportion of the general lexicon in each length.

Moreover, it is also important to note that previous studies confirm the regression of the final accent (Akinaga 1957, Aizawa 1996) in Japanese. There are relatively few words with final accent (4 %) and penultimate accent (9 %) in the general lexicon. This fact confirms that the proportionally minority accent type is likely to be replaced by the proportionally majority type (unaccentedness). Similarly, by examining two accent dictionaries (the 1893 (Yamada) and 1943 (NHK) editions), we observed that some of the words accented on the final mora were replaced by the penultimate pattern. We would like to put forth the following hypothesis: in some words (especially nouns derived from the verbal form), the direction of accentual change comes first from the avoidance of the final accent pattern, replaced by the penultimate pattern (in 1943) and then by the unaccented pattern (in 2016) (ex. *Itsuwari* “lie”, *kokoromi* “attempt”, *odoroki* “surprise”). Further studies will be necessary to confirm the hypothesis.¹⁸

¹⁸ One of the reviewer’s queries is worth mentioning here: is it possible that the fact that final accented words are being particularly vulnerable to becoming unaccented words triggers a general shift towards de-accentuation? In order to verify the proportion of each accent pattern in the older dictionary, we looked at the accent patterns of de-accented words that appear in the accent dictionary published in 1893 (Yamada). We examined the proportion of each accent pattern evolving to a given pattern. The main finding is that the direction of accentual patterns from -1 to -2 or -3 and from -2 to -3 are proportionally much higher than in the opposite direction (from -2 or -3 to -1 and from -2 to -3). Although we cannot generalize with only this work, this gives us a clear clue about the direction of accentual evolution, including the decline of final and penultimate patterns in favor of antepenultimate patterns (1893 → 1998) and in favor of unaccented pattern (1998 → 2016).

3.2 DISFAVORING FACTORS

We shall now turn to the investigation of the factors preventing or disfavoring de-accentuation. The question addressed here concerns the word length and the type of original accent that are less sensitive or even resistant to de-accentuation, namely i) smaller (1, 2 μ) and larger (5 μ and more) word sizes, and ii) words originally accented on the antepenultimate mora.

First, why is the smaller word size (1, 2 μ) less sensitive to de-accentuation? It is important to note first that no monomoraic words were de-accented in our data. As seen in Table (4), in the general lexicon, monomoraic words are largely dominated by the accented pattern (about 70 %). Moreover, the dominance of the accented pattern is reinforced in bimoraic words. The accented pattern is predominant with 83 % (65 % penultimate and 18 % final) compared to the unaccented one (17 %). The fact that both smaller sized (1-2 μ) and bigger sized (5 μ -) words tend to be accented, whereas medium-sized (3-4 μ) words tend to be unaccented in the general Japanese lexicon is probably a relevant point, which would require further inquiries.

According to Shioda (2017), an interesting trend can be observed: the initially unaccented monomoraic word *ha*^o “leaf” (*ha-ga*^o BH) now tends to be pronounced as accented (***ha-ga*** HB). The issue here is that *ha* has a minimal accentual pair homophone, namely *ha*^o “leaf” (unaccented) and ***ha*** “teeth” (accented). The minimal pair distinction is thus neutralized and a contrast is lost. Instinctively, since we are dealing with frequent minimal pair words, we may wonder whether the presence of an accent plays an essential role in monomoraic high frequency words. This also indicates that its minimal unaccented pair is less frequent. According to Shibata (1990 cited by Kubozono 2001), in only 14 % of the homonyms in Japanese, the accent patterns play a role in distinguishing the meaning. It would be interesting to study the frequency of accented and unaccented small-sized words, in order to measure the correlation with the accentual change.

Furthermore, it is also worth to note that *Minimal word effect* requires having

prominence (namely accent kernel) and this requirement should be most highly ranked when a word profile is minimal (bimoraic foot). Itō & Mester (2016) also cite a study by Hallé et al. (1991) that provides strong evidence for accent in small-sized words. This study suggests that the accented pattern is acquired earlier than the unaccented pattern in young Japanese children when it comes to bimoraic words.

Second, why are large-sized words (more than 5μ) less sensitive to de-accentuation? We have seen that in the general lexicon, the majority of these words have an accent (Table 4). We can naturally suggest that longer words are likely to be categorized as compound words. It is known that a compound word tends to be accented in order to mark a lexical boundary fulfilling a morphological role. The presence of a compound accent fulfills indeed a morpho-lexical role. Kubozono (2004) actually argues that there is a phonological boundary between 4μ and 5μ. 5μ or longer length words, are considered phonologically as compounds although they are morphologically simplex. The author claims that the boundary between simplex and compound words is supported by several pieces of evidence such as telephone numbers accentuation, sequential voicing phenomenon, or abbreviation word formation.

Although less affected than 4μ length, we noted that a relatively large number of de-accented words are 5μ words (16 %) followed by 6μ (7 %). This could also be explained by the presence of *deaccenting (pseudo) morphemes*. Some morphemes (especially in SJ and loanwords) have an influence on the accent assignment (McCawley 1968, Giriko 2009 etc.). Indeed, the majority of 5μ-6μ SJ words that are de-accented in our corpus contain a deaccenting morpheme (ex. *Syoo* “symptom” as in *ziheisyoo* “autism”, *kahunsyoo* “pollinosis” or *yaku* “role” as in *sanbayaku* “midwife”, *kensayaku* “inspector”). This is also true in loanwords: most de-accented words contain *pseudo* deaccenting morphemes (Giriko, 2009) with the word final /C-in/, /C-ia/, /C-ingu/ (ex. *Daazirin* “Darjeeling”, *etiopia* “Ethiopia”, *oopuningqu* “opening”). We should also note that there are some words whose final mora is the second part of a long vowel (i.e. one of the deficient mores /R/, as in *puressyaa* “pressure”, *purantaq* “flower box”, *ripootaq* “reporter”).

Third, why does the antepenultimate pattern resist to de-accentuation? We have seen that the antepenultimate pattern is originally dominant (51 %) in the general lexicon and in our corpus of de-accented words (45 %) (see Table 10). If we compare these two figures, we can conclude that this type is resistant to the de-accentuation phenomenon (see Table 10, 11). In fact, although any type of accent can theoretically be replaced by unaccentedness, it does not occur randomly. It seems that there is a resistance and robustness of the antepenultimate pattern.¹⁹ We discussed previously certain studies on the regression of the final pattern (Akinaga 1957, Aizawa 1996) replaced by unaccentedness. While previous works claimed that the antepenultimate pattern is a stable accent pattern, to which other patterns are changing, to the best of our knowledge, no specific previous studies have clearly mentioned *resistance* of a particular accentual pattern against the generalization of unaccentedness.

CONCLUSION

This paper has investigated some phonological factors influencing word de-accentuation in Tokyo Japanese. According to the literature, word length (especially 4 μ) is one of the most important causes of de-accentuation. However, there is another factor that has been significantly disregarded in the literature, but that can be linked to de-accentuation: the position of the original accent kernel. We examined these two factors in relation to de-accentuation, based on words that have undergone de-accentuation between two editions of the NHK pronunciation and accent Dictionary (1998 and 2016). We provided a

¹⁹ In our corpus (1155 words in total), we observed that there are 234 originally unaccented words which acquired an accent, namely the *neo-accentuation phenomenon* (*Kifukuka* in Japanese). A majority of the new accent kernel position is the antepenultimate mora (55 %). This tendency is reinforced especially in native words (70 %), compared with the proportion of SJ words (48 %) and loanwords (50 %). We also compared the proportion of neo-accentuated words (new accent position) and the one of de-accented words (original accent position), according to each word length (3-5 μ). The main result states that the proportions of neo-accented words on the antepenultimate mora are higher than these of de-accented words originally accented on this position. We can say this result supports the idea of the resistance and robustness of the antepenultimate pattern.

statistical descriptive analysis. We observed the proportion of de-accented words sorted by word length and the position of the original accent type. This data has also been compared to the proportion of the general lexicon (nominal words) in order to investigate the most affected word length and the original accent type by de-accentuation. Based on this comparison, it is possible to confirm that the two factors (word length and the position of the original accent kernel) are both correlated to de-accentuation. More precisely, we can confirm that the medium-sized words (especially 4 μ) originally accented on the penultimate mora are strongly affected by de-accentuation. Another important finding of our study, which supports previous studies, relates to the resistance to de-accentuation of the antepenultimate accent.

In addition, it is important to also mention that in native words and loanwords, the 4 μ length is the most affected length. However, in SJ words, the 3 μ length is the most de-accented, especially words with a deficient mora on the penultimate position (ex. *saQka* “author”, *goRi* “agreement”, *gaNka* “ophthalmology”). It is mentioned that this structure traditionally carries the accent on the initial mora, but some of them tend to be de-accented (Shioda 2016b).

One of the most important results in this paper is the existence of a resistance of a particular accent type, namely the antepenultimate accent. However, this is not a novel finding, as one of the reviewers indicated. Indeed, previous works claimed that the antepenultimate accent is a very stable accent pattern, to which other patterns are changing, as we discussed before in 1.2. Our study results support this traditional view. According to the literature and our findings, the antepenultimate accent and unaccentedness are two dominant accent types in Japanese. This can reveal a very interesting interaction between these two major accent types and their evolution (de-accentuation and neo-accentuation). One could ask how these two types interact with each other in the Japanese accent system. Since a word in Japanese can have accent type variation (i.e. several possibilities of pronunciation for one word), it would be interesting to verify the following hypothesis: is the variation between these two strong patterns more frequent than other combinations of

accented patterns?

Finally, as another additional issue, one also can ask if nouns tend to generalize by limiting them to only two canonical patterns (unaccentedness and antepenultimate). It is important to note that some studies (Aizawa 1992, 1996) confirm that verbs and adjectives tend towards neo-accentuation, while nouns tend towards de-accentuation. These two opposite directions of accentual evolution between the different lexical categories need to be examined more closely in order to understand what is actually happening in the Japanese lexicon as a whole. As Labrune (2012) mentions, one can wonder if nouns tend to generalize by limiting themselves to only 2 canonical patterns (unaccentedness and antepenultimate), as it is already the case in verbs and adjectives (unaccentedness or penultimate).

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COMMENTS

Overall, I am of the opinion that this paper is a solid contribution to the ongoing study of accent shifts in Japanese varieties. The current paper presents a nice overview of a statistical investigation looking at two corpus sources and seeing where de-accentuation has occurred. In my opinion, the paper fortifies some previous conclusions of the literature on Japanese phonology and clearly considers the role of both mora length and interacting factors such as suffixation on the trend towards de-accentuation in the 20th and into the 21st century.

It is obvious that the author has put in a large amount of labor into the preparation of both the corpus and their study. I have some recommendations for areas where the results of this work could be expanded further where the true depth of analysis is only hinted at in the current version. The paper also raises some questions that I would ask to be addressed in more depth in the final version.

1. Some Specific Notes. While the author mentions the Initial Dissimilation Principle, it is worth mentioning that there is weight-sensitive high tone shifting on heavy initial syllables in varieties such as Tokyo, Owari and Tottori Japanese. It should be made clearer that this is subject to variation. The author should perhaps also fortify the fact that she deals only with “Standard” NHK materials here.

I would like to see a slightly expanded discussion of the literature, such as Kubozono 2006 and Itō and Mester 2016, if possible so the path leading to her research is clearer.

This would make the work more accessible to readers less familiar with the discussion of Japanese pitch accent and tonology.

I would like to see more discussion of the author's corpus materials from NHK for transparency and also to provide more information for the non-specialist. I would like also further discussion of how she divided the corpus and to see further exemplification of relevant data. For example, more examples of deaccented words for the non-specialist such as morphologically simplex and complex forms & words of varying strata. It may be worth discussing what the author includes and excludes (e.g. exclusion of verbal forms), how she tagged nouns, what she coded for (e.g. did you mark stratum, simplex or complex status, words composes with deficient or only full moras, etc). Does her corpus include ANY word which was previously accented in 1998 which then is shown as losing its accent in 2016, or did she exclude certain forms? How did she deal with any variable forms which have both accented and unaccented variants listed?

On page 190, it is clear the author has deeply investigated the role of morphemes and divided morphologically simplex and complex forms in her corpus investigation. Are the statistics for de-accentuation for simplex versus complex forms entirely different? Would the author be able to expand more on how different affixation types affect the nouns with regards to de-accentuation? Quantifying this would be better than saying something like "The majority of 5 μ -6 μ SJ words..."

2. Broader Issues. The author discusses some generational shifts in the end of 3.1 with regards to final accent. I would like to see some expansion and clarification on this point for non-specialists since this is an interesting trend that could be useful for cross-linguistic and typological studies. In addition, could it be possible that final accented words being particularly vulnerable to becoming unaccented words triggered a general shift towards de-accentuation? Did this shift possibly lead to a general shift towards de-accentuation? I am interested in the author's view and synthesis of the path accent change is taking.

At another point, in the discussion of compounds on page 185 and following, the

author states that the penultimate accent is often affected by de-accentuation. Could this be viewed as a generational shift in compound accentuation strategies?

Focusing on one particular conclusion drawn in the paper, the author states that the antepenultimate position is robust, yet (9) suggests that 45 % of deaccented nominals originally had an antepenultimate accent and (13) also seems to suggest that the antepenultimate location is targeted by de-accentuation the majority of the time in 3 and 5 mora nouns. She does mention in the conclusion that 51 % of nouns are antepenultimate in accent, but it does not seem to protect these nouns from being deaccented. I am not convinced that antepenultimate nouns (whether simplex or complex) are particularly robust based on the facts presented by the author though we might expect a priori this to be true. While I am aware that this is a very robust accent location and can be considered a default (e.g., in many loanwords and compounds, and in varieties of Japanese such as Osaka and Tokyo Japanese), the de-accentuation data presented also suggest to me that perhaps this accent is not as robust or default as we could assume. Couldn't it be that de-accentuation is a general pattern which affects all nouns regardless of accent location, and antepenultimate accented nouns are deaccented often as this accent location was already quite common in the accented nouns? The author states that de-accentuation does not occur randomly, which obviously is true as it affects 3 and 4 mora nouns more, but she would need to provide more evidence in defense of the idea that antepenultimate accents are resistant to change or robust for this conclusion to hold.

I would like to know the author's view on the following: does syllable weight affect the distribution of unaccented and accentedness as much as word length? The author mentions the role of deficient moras in page 190 and in the conclusion. She shows that mora length shows a curious affect in the literature review and in her own research, but it is not clear if syllable weight and/or deficient moras do or do not have an effect. Is it possible that heavy syllables/deficient moras prevent de-accentuation somehow? The author states that this is for future studies, but I assume her corpus study marked or tagged this in some manner if she mentions it in the conclusion. A little more on this topic would be nice in

the conclusion at the very least.

REPLY

Regarding the first comment, I added a note that words beginning with a heavy syllable are often described as not necessarily undergoing the second principle (Initial Dissimilation Principle).

I totally agree with the fact that the references (Kubozono 2006, Itō & Mester 2016) are interesting and could help readers follow better the path leading to our work. However, because of a lack of space, and as some other new elements have been added in the literature following another reviewer's suggestion, I could not add the details of these references.

A note is added at the bottom of page 176 about the corpus from NHK dictionaries. I also added a new table (12) with examples of de-accented words in each length for the three lexical strata. Concerning the question about what I included in and excluded from the corpus, as the data comes from the list of words in previous works (Shioda 2016a, 2016b, 2017), I did not change anything. The original data was presented in three lists according to the three lexical strata as nouns that underwent de-accentuation. Accent change towards de-accentuation reported by NHK (Shioda 2016a, 2016b, 2017) is based on four different changes (the following description is not incorporated within the paper because lack of space):

i) addition: originally accented nouns, for which the possibility of pronunciation with the atonic pattern has been added;

ii) change of order (promotion): nouns that originally had the possibility of both the accented and the atonic pattern, for which the atonic pattern has been promoted over the accented pattern;

iii) change of order (demotion): nouns that originally had the atonic pattern in 1st rank and an accented pattern in 2nd and/or 3rd rank, but for which this order has been reversed,

i.e. the accented pattern is favored over the atonic pattern;

iv) deletion: nouns that originally had the atonic pattern, but this pronunciation possibility has been removed in favor of an accented pattern.

“De-accented” words are defined here as words that underwent “addition” or “promotion” of atonic pattern. For example, *natane* “colza” has only the penultimate accent in the NHK 1998 dictionary but the atonic pattern was added (to the 2nd rank) in the NHK 2016 dictionary, that is, this word has still the penultimate accent in the 1st rank. In my thesis, I studied the proportion of each accented type which cohabitates with the unaccented type (as in *natane*: penultimate accent and unaccented). The main finding is that the antepenultimate pattern is the most present pattern alongside unaccented pattern.

Unfortunately, I do not have statistical data for simplex versus complex SJ form. This study topic is ongoing and for the moment, I well noted the reviewer’s suggestion that quantifying these would help for improvement.

Concerning the question about some general accentual shifts with regards to the final accent, I incorporated the following note: One of the reviewer’s queries is worth mentioning here: is it possible that the fact that final accented words are particularly vulnerable to becoming unaccented words triggers a general shift towards de-accentuation? In order to verify the proportion of each accent pattern in the older dictionary, we looked at the accent patterns of de-accented words (between 1998 and 2013 editions) that appear in the accent dictionary published in 1893 (Yamada). We examined the proportion of each accent pattern evolving to a given pattern. The main finding is that the direction of accentual patterns from -1 to -2 or -3 and from -2 to -3 are proportionally much higher than in the opposite direction (from -2 or -3 to -1 and from -2 to -3). Although we cannot generalize with only this work, this gives us a clear clue about the direction of the accentual evolution, including the decline of final and penultimate patterns in favor of antepenultimate patterns (1893 → 1998) and in favor of unaccented pattern (1998 → 2016).

Concerning my claim about robustness of antepenultimate pattern. I still stand by confirmation that the antepenultimate functions as stable and robust compared to other

patterns. The reasons were already in the paper but is also added, according to another reviewers' comments, the following:

i) we would have expected the antepenultimate accent pattern to be de-accented more than it was in reality, when compared to the expected proportion of the general lexicon. However, this type was less de-accented than expected. This is true for the general data (all lengths) and as well as for each length (3 μ -6 μ) (cf. Table 10, 11, 13);

ii) note 18 which is added at the bottom of page 188 can support the robustness of the antepenultimate pattern.

Thanks to the last question and comments about the correlation between syllable weight and unaccentedness, I was able to incorporate a new Table (15). I can say that the originally accented on the penultimate position factor is a key factor for de-accentuation, mainly in the case of 4 μ native words consisting of only light syllable and having a morphological boundary in the middle of the word.