ABSTRACT

Japanese is widely recognized as a prototypical pitch-accent language, based on the fact that, given the “accent” location or the lack thereof, the tonal pattern of the entire word is totally predictable. Therefore, unlike tone languages, specification of the tone of each syllable is unnecessary. Consequently, it has been argued that, although Japanese may superficially resemble tone languages, it is essentially more like such stress-accent languages as English. However, unlike stress-accent languages, Tokyo Japanese exhibits no evidence of need to consider the so-called accented syllable more prominent than others. In fact, the very notion of accent may lead to an incorrect prediction that the vowel of an “accented” syllable is less likely deleted than other vowels. By examining the vowel devoicing (deletion) phenomenon in Japanese, the present paper reconsiders the notion of pitch accent as applied to Tokyo Japanese.

1. INTRODUCTION

Accent is a prominence given to a certain syllable in a word or phrase over the adjacent syllables, independently of the mode in which this prominence is produced. It serves to differentiate lexical and/or communicative meanings.

Languages are often characterized as tonal or non-tonal. Tonal languages utilize pitch to distinguish lexical items, whereas non-tonal languages do not use pitch distinctively. Tonal languages are further divided into tone languages and pitch-accent languages. In tone languages, the tone of each syllable is unpredictable and, therefore, must be specified in the lexicon. No syllable in tone languages is considered more prominent (i.e. accented) than any other(s). In pitch-accent languages, by contrast, the specification of some accent location(s) is sufficient to predict the tonal configuration, or melody, of the entire word. Therefore, the syllable on which such an accent falls is considered more prominent than other syllables. It can also be said that moving from one tone to the next in tone languages is a syllable-level phenomenon, whereas such a movement in pitch-accent languages is a word-level phenomenon.

The Tokyo dialect of Japanese has traditionally been described in terms of the way each tone-bearing unit carries either a high (H) tone or low (L) tone. (Whether the tone-bearing unit is a syllable or a mora remains controversial.) For example, the 5-syllable word /yamazákura/ ‘wild cherry’ is traditionally associated in the lexicon with the LHHLL pattern. Note that no syllable carries special prominence, and thus the notion of accent is foreign to this type of description.

In linguistics literature, however, Tokyo Japanese has been characterized as an archetypal pitch-accent language. At most one syllable is marked as accented, because such a description is sufficient to identify the melody of the entire word. (Not all Japanese words have accent. Those that contain no accented syllable are referred to as accentless words.) In the case of /yamazákura/, marking the third syllable as accented can correctly derive the LHHLL pattern by application of the following rules: (i) assign H to all syllables up to the accented syllable, if any, or to the final syllable if no syllable is marked accented; (ii) assign L to all syllables following the accented syllable; (iii) reassign L to the initial syllable unless it is accented. Because the initial L is considered as default, only the location where pitch drops from H to L is significant in Japanese tonal phenomena [1]. In this analysis, accent manifests as the H tone that is immediately followed by a L tone.

This tonal characteristic of Tokyo Japanese is represented in standard autosegmental description in such a way that one syllable in accented words is marked with a star, and the tonal pattern of the words containing a starred syllable is derived by use of the following rules: (i) associate the vowel of the starred syllable with H (a language-specific tone association rule); (ii) spread the H tone leftward to the initial syllable, and the L tone rightward to the final syllable (a universal tone association rule); (iii) insert the initial L where appropriate [2].

In these pitch-accent descriptions, although only one syllable is marked in the lexicon, every syllable is associated with either a H or L tone at the surface level. However, acoustical analyses of Japanese utterances provide little evidence of such a claim. That is, tones appear to be more sparsely distributed at the surface level [3]. So in recent years it has been argued that Tokyo Japanese is similar to stress-accent languages, e.g. English, even at the surface level [3]. In this new pitch-accent analysis, the notion of accent plays an even more significant role than had previously been supposed.

In English declarative intonation, the most significant cue of accent is pitch, followed by length, and then loudness [4]; accented syllables are pronounced more clearly than others, resisting a high level of vowel centralization [5]. Furthermore, those speakers who tend to delete vowels do not delete accented ones; e.g., the accented vowel [e] is maintained in ‘president’ /presidɛnt/ pronounced as [pɛzɪdɛnt]. It is, therefore, reasonable to conclude that the accented/stressed syllable in English is more prominent than other syllables. In Japanese, on the other hand, accent is manifested solely by pitch modulation; the accented syllable is neither longer nor louder than any others [6]. We will examine in the following whether the alleged accented syllable in Japanese is likely maintained.

It is important to note here that the term accent is used in two different senses: one is for prominence of a certain syllable over others, and the other is for predictability of the word tonal configuration. These two concepts are independent of each other. Recognizing a certain syllable as more prominent than others does not necessarily predict the melody of the word. Conversely, the fact that marking one syllable is sufficient to predict the word
recognition of vowel deletion results in consonant clusters that
are present in the native speakers’ perception, and because the
deleted vowels are nonetheless psychologically
prominent than other syllables. Or does it? Is /z/ in /yama-
toki/ ‘Aichi prefecture’ [9] or [kai̯] NOT [ka̯i̯]?

3.2. Devoicing of Final High Vowels
Martin points out that the high vowel in word-final position is
devoiced only if one of the preceding syllables is accented [10].
That is, according to Martin, (i) in accented words, the final high
vowel must be devoiced if it is unaccented, but (ii) in accentless
vowels, the final high vowel must not be devoiced. Martin’s
observation is valid to some extent. Regarding (i), devoicing of
/u/ is obligatory in the verb-ending /másu/ and the copula /désu/
in Tokyo Japanese declarative intonation; regarding (ii), /i/ is
normally devoiced in /áki/ ‘autumn’ (the first syllable accented),
but it must not be devoiced in /áki/ ‘opening’ (accentless).

However, contrary to Martin (i), final high vowels need not
be devoiced in most accented words, or at least the utterances
lacking the final devoicing do not necessarily sound unnatural in
Tokyo Japanese. Table 3 below provides some examples of
accented words with a voiced final high vowel that can be
compared with the words with identical strings of phonemes, but
lacking accent. It can be said that, with some exceptions (e.g.
/u/ is obligatory in the verb-ending /másu/ and /désu/, as mentioned above), devoicing of high
vowels in word-final position is optional.

3.3. Successive Vowel Devoicing
Han contends that devoicing of two consecutive syllables is rare,
and that devoicing of three consecutive syllables does not occur
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prominent than other syllables. Does or does it? Is /z/ in /yama-
zakura/, for example, more prominent than the other syllables?

In its discussion of vowel devoicing — a phenomenon in
which high vowels drop in certain phonological environments —
the present paper raises the question of whether it is appropriate
to consider Tokyo Japanese as a prototypical accent language.

2. VOWEL DEVOICING

In Japanese, especially in the Tokyo dialect, high vowels
normally drop when they occur between voiceless obstruents or
in word-final position. (Non-high vowels may also drop, but less
frequently and only in fast utterances [7, 8].) This phenomenon
of vowel deletion is customarily referred to as vowel devoicing.
Although the term “devoiced vowel” sounds oxymoron, most
analysts are reluctant to consider it a vowel deletion phenomenon
because the deleted vowels are nonetheless psychologically
present in the native speakers’ perception, and because the
recognition of vowel deletion results in consonant clusters that
would make Japanese phonotactics highly complex (cf. [8]).

Table 1 provides some examples of vowel devoicing.

Table 1: Examples of vowel devoicing

| /kiken/ | ‘danger’ | /kken/ or [kiken] |
| /kusuri/ | ‘medicine’ | /ksuri/ or [kusuri] |
| /aki/ | ‘autumn’ | /ak’i/ or [aki] |
| /aku/ | ‘evel’ | /ak’u/ or [ak’u] |

Table 2: Devoicing of accented vowels

| /kási/ | ‘lyrics’ | [ka‘f] or [ka‘f] |
| /kási/ (accentless) | ‘a loan’ | [ka‘f] NOT [ka‘f] |
| /káts/ | ‘value’ | [ka‘t] or [ka‘t] |
| /kati/ (accentless) | ‘victory’ | [ka‘t] NOT [ka‘t] |
| /káu/ | ‘to tax’ | [kasuj] or [kasuj] |
| /káu/ (accentless) | ‘to loan’ | [kasú] NOT [kasú] |
| /kaku/ | ‘write’ | [kakú] or [kakú] |
| /kaku/ (accentless) | ‘to loan’ | [kakú] NOT [kakú] |

Table 3: Devoicing of the final vowel in accented words

Table 4: Devoicing of the final vowel in unaccented words

| /toiki/ | ‘sigh’ | [toik] |
| /mukási/ | ‘old times’ | [muwka‘f] |
| /ukátu/ | ‘careless’ | [ukatsu] |
| /keisátu/ | ‘police’ | [kesatsu] |
| /kyookátu/ | ‘threat’ | [kjo‘katsu] |
| /hénzimáti/ | ‘waiting for reply’ | [hend‘imáti] |
| /osyoogátu/ | ‘new year’ | [ofo‘nat] |

In these words, final-vowel devoicing is the norm but not
obligatory. It appears, therefore, that the constraint on final-
vowel devoicing, as claimed by Martin (ii), applies only to
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The accent location is determined by examining hyper careful two carries accent. (The relevant part is marked in bold face. devoicing are in non-final positions and the first syllable of the more prominent than the final syllable. devoicing is concerned, the so-called accented syllable is not syllables do, and thus they do not exhibit any special status. Accented syllables undergo devoicing just as unaccented /titikata/ ‘paternal side’ [tʃɪtʃɪkətə] /hutuka/ ‘two days’ [ʃʊtsʊkə] /kifukin/ ‘donation money’ [kiʃɪkʊʃɪn] /tukikage/ ‘moonlight’ [tsʊkɪkɪgə] /sikitumuru/ ‘spread over’ [ʃɪkɪtsʊmʊɾu]

Table 5: Devoicing of successive vowels

<table>
<thead>
<tr>
<th>Accent</th>
<th>Vowel</th>
<th>Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>/yusikisa/</td>
<td>‘intellectuals’</td>
<td>[juʃɪʃɪkəʃə]</td>
</tr>
<tr>
<td>/karisyusya/</td>
<td>‘temporary lodging’</td>
<td>[kariʃʊʃʊʃə]</td>
</tr>
<tr>
<td>/soosikian/</td>
<td>‘chief commander’</td>
<td>[ʃʊʃʊʃɪkəʃə]</td>
</tr>
</tbody>
</table>

Table 9: Devoicing of accented vowels in longer words

To sum up, the so-called accented syllables do not evidence any more significance than adjacent unaccented syllables in the vowel devoicing phenomenon; the vowels of accented syllables drop as freely as those of unaccented syllables.

4. DISCUSSION

Analyses of Tokyo Japanese as a pitch-accent language encounter tremendous difficulty when they attempt to describe vowel devoicing. Because the accentual H tone cannot be associated with a voiceless segment, the pitch-accent analyses are forced to shift the accent to some adjacent syllable (or delete the accent).

Determining the accent location is difficult when vowels are devoiced, and, not surprisingly, there are considerable variations among native speakers when they are asked to voice all syllables. Furthermore, in recent years tonal patterns of words have been rapidly changing. Kindaichi reports that less than 50 years ago, when he served as a pronunciation advisor at Japan Broadcasting Corporation (NHK), such words as /tosiyori/ ‘elderly people’ and /hirusugi/ ‘early afternoon’ had accent on either the final or the penultimate syllable, and he selected final accent as the norm [12]. Today these words are uttered exclusively with penultimate accent, /tosiyori/ and /hirusugi/.

Kindaichi also points out that most unaccented adjectives have recently acquired accent on the final syllable of the stem. For example, /tumeta-i/ ‘cold’, /akaru-i/ ‘bright’, /kanasi-i/ ‘sad’ used to be pronounced without accent, but now, they are normally pronounced with penultimate accent.

Because of these rapid changes, many descriptions in accent dictionaries have become obsolete and unreliable. Understandably, inaccurate descriptions are sometimes observed in linguistic literature as well. McCawley, for example, transcribes the verbs /huku/ [ʃʊʃʊku] ‘blow’, /tuku/ [tsʊkʊʃ] ‘adhere’, and /kakusu/ [kakʊʃʊʃ] ‘conceal’ with final accent due to the penultimate vowel devoicing [13, p.266]. He contends that when an accented syllable is devoiced, accent generally shifts one syllable to the right. However, native speakers do not utter these words with the LH or LHH pattern when all syllables are fully voiced, and they do not perceive any accent shift between the voiced and devoiced versions of pronunciation.

McCawley also argues that the adverbial forms of the adjectives have underlying antepenultimate accent, e.g. /tikaku/ [ʃɪʃɪkəʃə] ‘near’ and /huku/ [ʃʊʃʊku] ‘deep’, but because these antepenultimate syllables are devoiced, accent manifests itself on the penultimate syllables, i.e. it is shifted to the right and voiced in trisyllabic words. Some might take this as evidence for an accent effect on vowel devoicing. However, such an irregularity is more likely a property of trisyllabic words in general than of the accented syllable. If the same strings of sounds are embedded, as shown in Table 9, the accented vowels become devoiced. Therefore, as in the two previous cases, we do not find evidence for accent effects here either.
realized as /tikáku/ and /hukáku/. However, both HLL and LHL melodies for these words are normal in Tokyo Japanese. McCawley’s data provide no evidence for considering that vowel devoicing shifts accent synchronically.

Haraguchi’s autosegmental account is also entrapped by the problem of devoiced accented syllables [2]. He argues that when devoicing occurs, accent shifts one segment to the left. For example, he transcribes the past-tense form of /kanási-i/ as /kanási-katta/ although the devoiced /si/ is associated underlyingly with accent. This description of accent shift is untenable; /kanási-katta/ is the norm, and /kanási-katta/ is an anomalous utterance.

As mentioned previously, native speakers categorize such words as /húku/ [fkuku] ‘blow’ and /túku/ [tsuku] ‘adhere’ together with those words with the HL melody, rather than with single-syllable words, despite the fact that there is no H tone in the words. Han explains this phenomenon in such a way that the pitch fall or rise of the second syllable is the cue to accentual patterns. If the final vowel is pronounced with a pitch fall, the perceived accent is HL, whereas if the final vowel involves a pitch rise, the melody of the word is perceived as LH [11]. Sugito argues that the most significant acoustic correlate of the Japanese accent is a falling F0 contour on the post-accent syllable, rather than the F0-peak location itself, and that native speakers perceive an illusory H tone on a syllable when it is followed by a falling F0 contour [14]. Subsequent researches report the degree of the F0 fall necessary to induce such illusory perception [15, 16]. It has been reported that, unlike Han’s claim, the post-accent syllable need not have a rising pitch for LH perception; if the F0 fall rate is less than a certain value, native speakers associate the word with the LH melody.

However, because all of the researchers mentioned herein have analyzed the Japanese tonal phenomena within the pitch-accent paradigm, the existence of an accentual H tone is presupposed. No experiment has been conducted to verify the claim that native speakers in fact hear an illusory H tone on a devoiced accented vowel in words like /húku/. The researchers typically synthesized bisyllabic words with a devoiced first vowel and varying F0 fall on the second vowel, and asked native speakers to identify the meanings of each stimulus, e.g. whether [fkuku] is ‘blow’ (HL) or ‘cloth’ (LH). If the native speakers identified the word as ‘blow’, then it was assumed that they heard an illusory H tone on the first syllable. However, it may be the case that native speakers simply hear the presence or absence of a pitch fall (a falling tone, F).

Although no one argues against the significance of such a pitch fall, representing it as binal H0 or monotonal F0 is not a mere notational difference. The F tone can occur without a preceding H tone, but the binal H0 requires the existence of a H. The issue here is whether the H is present in all accented syllables in Japanese. The answer appears to be negative because words like /kána/ (conventionally known as HLL) are sometimes pronounced with a very low-pitch on the first syllable, /ka/ in this case, and a significant fall on /na/. The resultant utterance conveys a peculiar nuance, and yet it is perceived as normal as far as the tonal configuration of the word is concerned. By contrast, if the initial syllable exhibits a noticeable pitch fall, the utterance will be perceived as deviant.

Despite the fact that the word melody is predictable, there is no reasonable basis for the syllables conventionally known as accent carriers to be considered more prominent than others. In other words, those “accented” syllables do not bear accent as defined as a prominence. The distinctive factor in Tokyo Japanese is a pitch fall, which appears to be associated with a syllable boundary, rather than a particular syllable. Furthermore, if such an association is impossible, due to vowel devoicing, the syllable following the boundary is more significant than the preceding one.

5. CONCLUSION

The present paper has examined whether there is any basis to consider that the “accented” syllables in Tokyo Japanese are more prominent than the “unaccented” syllables. As far as vowel devoicing is concerned, one is unable to find any evidence for such a claim; the “accented” syllables are not more significant than the others. On the other hand, it is unarguable that the melody of words is predictable, and thus specification of the tone of each syllable is superfluous.

How then should Tokyo Japanese be characterized in typological terms? From the perspective taken in this paper, grouping it with tone languages is a more natural categorization than grouping it with such accent languages as English. Tokyo Japanese is a tone language, however impoverished it is.

REFERENCES