

Tonal adaptation of English loanwords in Cantonese

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This study examines the tonal adaptation of English loanwords in Cantonese spoken in Hong Kong. We adopted the analyses of previous research (Kiu, 1977; Silverman, 1992) and incorporated seeming exceptions. The major rules are: 1) The stressed syllable in English usually bears the high tone in Cantonese, and it includes both primary and secondary stress. 2) If the English word is (historically) viewed as the compounding of two free morphemes, both syllables receive the high tone. 3) Pre-tonic unstressed syllable receives a mid tone, while post-tonic unstressed syllable receives a low tone. 4) When the English word contains a consonant cluster, a vowel is inserted to break the cluster and the created syllable usually carries the low tone. 5) A high-tone morpheme that indicates colloquial style is attached to the end of most loanwords. This morpheme changes the final low tone to a rising tone. However, not all the loanwords conform to these patterns. For example, the borrowing of verbs usually has different tonal assignment. The consonant type of the English word also plays a role. If the English syllable ends in a stop, it carries an entering tone and the morphemic high tone cannot be attached. In addition, palato-alveolar codas in English, such as /ʃ/ and /tʃ/, seem to block high-tone morpheme attachment as well. This study shows that the tonal adaptation of English loanwords in Cantonese is not just a stress-to-tone mapping. The tonal assignment is also determined by the consonant types in English, word class, position of the syllables, and so on.

1. Introduction

The study of loanwords has become prevalent during the past decade. For example, a recent issue of *Lingua* in 2006 was devoted to loanwords, while a special issue of the *Journal of East Asian Linguistics* (2008, issue 4) concentrated on the discussion of loanword phonology in East Asian languages. Most recent studies on loanwords have focused on how the segments of the source languages are incorporated into the recipient languages (e.g. Ito et al., 2006; Kang, 2003; Paradis, 2006; Uffmann, 2004), but only a few studies have explored the interaction of two prosodic systems. Especially interesting are cases of borrowing when the two languages make different linguistic use of pitch. For instance, the source language may use stress while the recipient language adopts a pitch-accent system (see Kubozono, 2006 for English into Japanese; Kubozono, 2007 and Lee, 2005 for English into South Kyungsang Korean; Kim, 2005 for English into North Kyungsang Korean), or the source language makes use of stress and the host language uses lexical tones (Kenstowicz & Suchanto, 2006 for English into Thai; Kiu, 1977 for English into Cantonese; Wu, 2006 for English into Mandarin Chinese; Hsieh &

Kenstowicz, 2008 for English into Tibetan), or the source language with pitch-accent may be adapted into a tone language (Davis & Tu, 2007 for Japanese into Taiwanese). The analyses showed that the host language may assign the prosodic patterns of the loanwords according to the original pitch contour in the source language (the cases of English into Cantonese and Mandarin). Or the loanwords may display prosodic patterns predictable from the syllable structure but independent from the source language (the cases of English into Japanese, North Kyungsang Korean, South Kyungsang Korean, and of Japanese into Taiwanese). The present study aims to give an overview of the tonal adaptations of English loanwords in Hong Kong Cantonese, and explore how the prosody of the loanwords is determined.

Hong Kong Cantonese has a rich amount of loanwords from British English, because of the period of Britain colonization lasting over 150 years. Consequently many loanwords are frequently used in their daily conversation. Kiu (1977) established some tonal rules for the English loanwords. In his analysis, the stressed syllable in English always receives a high tone in Cantonese. An unstressed syllable in word-final position following the stressed syllable always carries the rising tone. A low tone occurs on syllables in other positions, such as an unstressed syllable before the stressed one. The rules he proposed seemed very simple. But there are several exceptions to the rules that were not mentioned in the analyses. One instance is the loanword for ‘doughnut’: [dɔ̃n HH nɔ̃t H]¹, for which both stressed and unstressed syllables receive the high tone. Another word is ‘microphone’: [maj HH kɔ̃: HH fɔ̃ŋ HH], where not only the syllables with primary and secondary stress bear a high tone, but also the unstressed syllable in between. Hence some modifications to his analyses may be required.

Silverman (1992) examined the tonal patterns of English loanwords in Cantonese as well. He proposed that English words were borrowed into Cantonese through both Cantonese speakers’ perception of the original forms and the operation of Cantonese phonology to modulate the perceived forms to be more native-like. Hence some adaptation rules apply at the Perceptual level and others at the Operative level. For example, the compound like ‘dockyard’ was perceived as the combination of two distinct morphemes at the Perceptual level. Therefore each free morpheme was assigned a high tone, which surfaces as the output [dɔ̃k H ya: HH]. Hence it seemingly violates the rule that only the stressed syllable receives the high tone. But it is actually because the perceived stress pattern by the Cantonese speakers is different from that in contemporary English. Another example is the word ‘sociology’, which is borrowed as [sow MM si: MM]. He proposed that the truncation probably occurred in the Operative level since the tonal assignment of these two syllables matches the prosody in the original form. Thus this word should be fully perceived at the Perceptual level and assigned the mid tone to the unstressed syllables and high tone to the stressed syllable. Then due to the preference of disyllabic words in Cantonese phonology, only the first two syllables were preserved at the Operative level and surfaced with the mid tone. These two examples show that the form of the loanwords is determined by both Perceptual and Operative parameters.

¹ The letters in the lowercase are the transcription of the segments, while the capital letters transcribe the lexical tones. H stands for the high tone, M for the mid tone, and L for the low tone. Every mora carries a tone (Yip, 2002b). Hence bi-moraic syllables carry full tones such as HH or LH, while mono-moraic syllables carry entering tones like H, M, or L. All the loanword examples in this study are transcribed in this manner.

Besides proposing the multiple scansion in loanword adaptation, Silverman (1992) suggested one more rule to explain the rising tone in word-final position commonly found in loanwords. Unlike Kiu (1977), which postulated that the unstressed syllable following the stressed one received a rising tone, Silverman hypothesized that a high-tone morpheme which indicates colloquial style is always attached to the end of the loanwords. This hypothesis comes from the phenomenon that the high-tone morpheme attachment is also observed in the formation of hypocoristics in Cantonese. Hence it is possible that the native phonological rule applies to the formation of loanwords. The analyses by Silverman (1992) could account for most loanwords. Yet the loanwords that end in a low tone probably need some explanation. In addition, given the active operation of the disyllabic word-form preference in his data, the words that are disyllabic in English but become tri-syllabic in Cantonese are obvious exceptions, such as ‘spanner’ [si: LL ba: HH la: LH].

The current study will present the loanword data according to the number of syllables and the stress patterns of the English words and the number of syllables and the tonal patterns of the Cantonese words. I will adopt rules from the previous literature, and propose additional rules to account for more data. I will also discuss the exceptions and propose possible explanations.

1.1. Corpus

Many loanwords in my analysis came from the website that lists the English loanwords in Cantonese (<http://ihome.ust.hk/~lbsun/hkloan.html>). A native speaker of Cantonese read all the words he was familiar with from the website. He also provided additional loanwords that he knew. His recording was later transcribed by the author. Examples were also collected from the published literature, such as Bauer and Benedict (1997), Cheung (1986), Silverman (1992), and Yip (1993, 2002a).

1.2. Cantonese consonants, vowels, and tones

The phonetic transcription of consonants and vowels in this study mainly follows Bauer and Benedict (1997) and Cheung (1972). The consonant and vowel inventory is shown below. Cantonese only allows certain consonants to appear in coda position, such as nasals /m, n, ŋ/, unreleased stops /p, t, k/, and glides /w, j/. The palato-alveolar consonants [tʃ, tʃ̚, tʃ̚w] are allophones of the alveolar consonants /s, ts, ts̚/ when preceding front vowels. As for the vowels, [i] is the allophone of /i/, [e] is the allophone of /e/, [u] is the allophone of /u/, and [o] is the allophone of /o/. These four non-contrastive allophones, plus /ɔ/, can only occur in closed syllables. The vowels that appear in open syllables are the longest, those in syllables closed by stops are the shortest, while those that occur in syllables closed by nasals and glides are in between.

<i>Cantonese consonants</i>				<i>Cantonese vowels</i>			
p	t	k	kw	i	y	u	
p ^h	t ^h	k ^h	k ^h w	* ^h		* ^h	
m	n	ŋ		*e	ɛ	*o	
f	s	* ²	h	æ	ɔ		
	ts	*t ^h		a			
	ts ^h	*t ^h ^h					
w	l	j					

As for the tones, there are six full tones and three entering tones in Cantonese. The six full tones occur with open syllables or syllables closed by sonorants. The entering tones go with the syllables ending in stops (p, t, k) and are shorter than other syllables. The tones are represented by numerical values in Bauer and Benedict (1997), with 5 signifying the highest pitch and 1 the lowest pitch. For the purpose of the present analysis, I will use the letter H, M, and L to signify the pitch height. H represents the values 5 and 4, M represents 3, and L represents 2 and 1. The Cantonese nine tones in both Bauer & Benedict’s notation and this study’s are listed below.

	High level	High rising	Mid level	Low falling	Low rising	Low level	High entering	Mid entering	Low entering
B & B	55	25	33	21	23	22	5	3	2
This study	HH	LH	MM	LL	LM	LL	H	M	L

Note that the low-rising tone is never used in loanwords. And under this notation, two distinct tones, low-falling and low-level, become undistinguishable. This does not seem to cause a problem since these two tones are mostly used under the same conditions in the data collected. Hence both of them should be considered a low full-length tone LL.

2. Analysis

In the analysis, the loanwords are first categorized according to the number of syllables in English, i.e. monosyllabic, disyllabic, and tri-syllabic. For the words that have the same number of syllables in English, they are then ordered by the number of syllables in Cantonese.

2.1. Monosyllabic

2.1.1. English words

The monosyllabic words are always stressed in English. They are adapted into Cantonese as either monosyllabic or disyllabic.

² The consonants with asterisk are non-contrastive allophones.

2.1.2. Monosyllabic Cantonese words

The monosyllabic Cantonese loanwords almost always carry the high tone. Whether it is a full-length high tone HH or an entering high tone H depends on the syllable structure of the English form. Some examples are provided in (1).

(1) <i>English</i>	<i>Cantonese</i>
beat	[pit H]
card	[k \square at H]
lift	[lip H]
tie	[t \square aj HH]
fund	[f \square n HH]

If the English word ends in a stop, it carries the entering tone H, as in ‘beat’ and ‘card’. Notice that the voicing distinction in the coda position in English (/t/ vs. /d/) is neutralized into a voiceless unreleased stop (/t/), since only voiceless stops are allowed in the coda position in Cantonese. In addition, the post-vocalic / \square / as in ‘card’ is dropped because it is normally not pronounced in British English. It could also be due to the fact that post-vocalic / \square /-deletion is a common phenomenon in loanword adaptation (e.g. Kenstowicz, 2001; 2006). An interesting case is the word ‘lift’. It ends with a consonant cluster (CC). In most of the Cantonese loanwords we examined, when there is CC in the coda position, the second consonant is omitted while the first one is preserved. But since the fricative /f/ is not a legitimate coda in Cantonese, it is assimilated to the closest coda possible, which is /p/. And this word carries the entering H tone. When the English monosyllabic word comprises a simple open syllable or ends in a nasal coda, it carries a full-length high tone, as in ‘tie’ and ‘fund’.

2.2. Disyllabic

We can divide the English monosyllabic words that are borrowed as disyllabic Cantonese words into several types. The first category is when the English words have consonant cluster in the onset. Some examples are given in (2).

(2) <i>English</i>	<i>Cantonese</i>
spare	[si: LL p \square : HH]
stick	[si: LL t \square k H]
fluke	[fu: LL l \square k H]
cream	[kej LL lim HH]
plum	[pow LL l \square m HH]
brake	[p \square k L l \square k H]

Cantonese does not allow consonant cluster in the onset position. Thus a vowel is inserted between the CC. The syllable composed of the first consonant and the epenthesized vowel receives a low tone, while the syllable consisting of the second consonant and the original vowel bears a high tone. In this pattern the stressed syllable in

English is assigned a high tone in Cantonese, and the created syllable, which should not be stressed in English, carries a low tone. Usually a long vowel or diphthong is inserted. But there is one instance that the vowel is short and followed by a stop coda: ‘brake’ [p^hak L l^hak H]. The CC onset of this word is a voiced stop followed by a liquid, while others are voiceless stop followed by a liquid. Note that both the voiceless and voiced stops are adapted as the voiceless unaspirated stops in Cantonese. Hence the voicing distinction may be preserved in the length of the inserted vowel. For voiceless stops, a long vowel is inserted. For voiced stops, a short vowel followed by a stop coda is inserted.

The second category, which is a common pattern in Cantonese loanwords, consists of English monosyllabic words that end in fricatives and liquids. It also includes words that end in CC in which the first consonant is a sibilant or /l/. Some of these words are listed in (3).

(3) <i>English</i>	<i>Cantonese</i>
size	[saj HH si: LH]
file	[faj HH low LH]
pear	[p ^h : HH lej LH]
toast	[t ^h : HH si: LH]
film	[fej HH l ^h m LH]

When these words are borrowed, a vowel is inserted after the coda (as in ‘size’, ‘file’, and ‘pear’), or after the first consonant if the coda is a CC. The second consonant is omitted if it is a stop (as in ‘toast’), but retained if it is a nasal (‘film’). The stressed syllable bears a high tone, while the second syllable bears a rising tone LH. The reason that the created/unstressed syllable does not carry a low tone but a rising tone has been proposed by Silverman (1992). He suggested that all the loanwords are attached by a high-tone morpheme in the end, which indicates colloquial style. This morpheme attachment applies vacuously to the loanwords that end in a high tone. But for those words under this category, in which the final unstressed syllable receives a low tone, this attachment results in a rising tone LH. This explanation is plausible given that most of the loanwords end in a high tone or rising tone.

The third category contains words that either break the rule that the stressed syllable receives a high tone, or do not show high-tone morpheme attachment. There are not many such words and they are listed in (4).

(4) <i>English</i>	<i>Cantonese</i>
fail	[fej LL low LH]
mince	[min LH t ^h i: LL]
kiss	[k ^h i: HH si: LL]
cash	[k ^h : HH ^h y: LL]
punch	[p ^h n HH t ^h i: LL]

For the word ‘fail’, the stressed syllable carries a low tone instead of a high tone. For ‘mince’, the stressed syllable receives a rising tone, and the final syllable bears a low

tone rather than a rising tone. ‘Kiss’ has high tone on the stressed syllable, while the final epenthesized syllable carries the low tone instead of the rising tone. A possible explanation for the unexpected tonal patterns of these words is that they belong to categories other than nouns. ‘Fail’ is most often used as a verb, ‘mince’ as an adjective, while ‘kiss’ can be both a verb and a noun. Therefore these words may exhibit adaptation patterns different from nouns. The other two examples in (4) seem to block high-tone morpheme attachment and thus end in a low tone, such as ‘cash’ and ‘punch’ as in fruit punch. It could be the palato-alveolar coda in these English words that causes the blocking. Yet we cannot make any certain claim out of two examples.

2.2.1. Disyllabic English words

Most disyllabic English words are borrowed into Cantonese also as disyllabic. While the English words may have stress on the first or second syllable, mostly the stressed syllable bears a high tone in Cantonese. We will also look at disyllabic English words that become tri-syllabic in Cantonese.

2.2.2. Disyllabic Cantonese words

For the disyllabic English words that are adapted into Cantonese disyllabic words, the tonal patterns are determined by whether the English form has initial or final stress. Even for the English words that are stressed on the first syllable, they receive different tone assignment if the words end in a single stop coda (not CC), or if the words can be viewed as a compound. We will first look at English words that have stress on the first syllable in general. The most common tonal pattern for such words is a high tone on the stressed syllable and a rising tone on the unstressed/final syllable. We present some examples in (5).

(5) <i>English</i>	<i>Cantonese</i>
number	[n [□] m HH pa: LH]
movie	[mu: HH fi: LH]
sergeant	[sa: HH t [□] in LH]
brother	[pa: HH ta: LH]
broker	[p [□] k H k [□] a: LH]

This pattern is very productive in Cantonese loanwords, and the tonal melody is the same as the English monosyllabic words ending in sibilants and /l/ (example (3)). The second syllable, being unstressed, receives a rising tone rather than a low tone because of the high-tone morpheme attachment, as proposed by Silverman (1992). There are two segmental issues relevant to the tonal patterns in these examples. First, in the word ‘sergeant’, the stop coda of the second syllable is dropped because it is the second consonant of the CC. Thus this syllable carries a full-length tone LH instead of an entering tone. Second, the CC onset in the words ‘brother’ and ‘broker’ is simplified by deleting the liquid rather than inserting a vowel between the stop and the liquid. As a result, these words remain disyllabic in Cantonese. This phenomenon has been noted by Silverman (1992), that there seems to be a preference for disyllabic words in Cantonese. Thus the CC is simplified by vowel epenthesis if the insertion results in a disyllabic word.

If epenthesis would conflict with the disyllabic preference, deletion of the second consonant (usually liquid) is the preferred strategy.

The next type includes words that have initial stress in English, but the second syllable ends in a single stop (not a consonant cluster). The stressed syllable still carries a high tone, but the unstressed syllable carries the entering low tone, as in ‘omelet’ [ŋan HH lit L]; ‘cutlet’ [k□t H lit L]; ‘salad’ [sa: HH l□t L]. The reason that the final syllable does not bear a rising tone is possibly due to moraicity. The syllable ending in a stop is mono-moraic in Cantonese, while open syllables and syllables ending in sonorants are bi-moraic (Yip, 2002b: 176 – 77). The bi-moraic syllables can carry the six full-length tones, but the mono-moraic syllables can only carry the extra-short entering tones. The second syllable of these loanwords is borrowed as a mono-moraic syllable ending in a stop. Therefore the high-tone morpheme cannot be added to such syllables since they cannot carry the full-length tone. Accordingly these syllables remain an entering low tone.

The third type is when the English words can be treated as compounding of two free morphemes either historically or contemporarily. Some of them are listed in (6).

(6) <i>English</i>	<i>Cantonese</i>
doughnut	[t□:n HH n□t H]
pancake	[pan HH k□k H]
sirloin	[s□: HH lan HH]
ball shirt	[p□: HH s□t H]
bow tie	[p□: HH t□aj HH]

In the first three examples in (6), they originated from compounding of two free morphemes. Even if they are now a single word with stress on the first syllable, they are borrowed into Cantonese as two stressed syllables. Thus both syllables receive a high tone. The second two examples are clearly compounds, and both syllables bear a high tone.

Lastly there are some exceptions. They are illustrated in (7).

(7) <i>English</i>	<i>Cantonese</i>
copy	[k□□p H p□i: LL]
major	[mej HH t□œ: LL]
minor	[man HH na: LL]
cookie	[k□□k H k□ej LL]
sorry	[s□: HH lej LL]
euro	[ŋ□: HH l□: LL]
pudding	[p□: MM d□ŋ HH]

The majority of words in (7) show a high-low contour. The initial stressed syllable receives a high tone, while the final unstressed syllable bears a low tone. Thus the difference between these words and previous ones is that the high-tone morpheme does not seem to be attached. There are some possibilities. First, it may be due to the word

class. ‘Copy’ is borrowed as a verb, while ‘major’ and ‘minor’ can be used as both a verb and a noun. Therefore the tonal adaptation of verbs may be different from that of nouns. Second, recent borrowings may be different from older borrowings. For example, ‘euro’ is probably a very recent borrowing, and thus the high-tone morpheme attachment may be no longer necessary in the tonal adaptation. Third, the tone assignment may be influenced by the segments as well. For example, the palato-alveolar consonant in ‘major’ may block the high-tone morpheme attachment. It is also possible that these words are simply exceptions.

Then we will examine the English disyllabic words that have stress on the second syllable. There are not many such words in the loanwords, and the pattern is very regular. The unstressed syllable is assigned a mid tone and the stressed syllable carries a high tone. The examples are provided below.

(8) <i>English</i>	<i>Cantonese</i>
cigar	[ɿyt M ka:HH]
chiffon	[ɿyt M fɿŋ HH]
buffet	[pow MM fejHH]
insurance	[in MM sɿ:HH]
percent	[pɿœ:HH sɿn HH]

One word in (8), ‘insurance’, demonstrates that truncation occurs in Cantonese loanwords. It is not uncommon that only the first two syllables of the English word are borrowed. But the stress-to-tone relationship stays unchanged. As for the reason that the unstressed syllable before the stressed one does not carry a low tone but a mid tone, it may be that most of the vowels in this position are not reduced. Hence this position is possibly not as weak perceptually as the unstressed syllable after the stressed one. Then it carries the mid tone that is not as salient as the high tone, but more salient than the low tone. As for the word ‘percent’, it can be regarded as compounding of ‘per’ and ‘cent’ historically, and thus it is borrowed into Cantonese with high tone on both syllables.

2.3. Tri-syllabic Cantonese words

In some cases the disyllabic English words are expanded into three syllables in Cantonese through vowel insertion. These words are listed in (9).

(9) <i>English</i>	<i>Cantonese</i>
spanner	[si: LL pa: HH la: LH]
snooker	[si: LL lɿk H ka: LH]
forecast	[fɿ: HH kɿa: HH si: LH]
passport	[pɿa: HH si: LL pɿɿt H]
tennis	[tɿɿ: HH ni: LL si: LH]
disco	[tɿk H si: LL kow HH]
sandwich	[san HH mɿn LL tɿi LL]
cocaine	[hɿ: LH ka: HH jan HH]

The borrowed forms of ‘spanner’ and ‘snooker’ are inserted a vowel to break the CC onset. The created syllable receives a low tone, while the unstressed syllable after the stressed one receives a low tone and surfaces as a rising tone due to the high-tone morpheme attachment. The words ‘forecast’ and ‘passport’ can be viewed as compounds. Hence both syllables corresponding to the English form carry the high tone. The epenthetic vowel in word-final position bears a rising tone, while that in the non-final position bears the low tone. ‘Tennis’ conforms to all the tonal rules. The unexpected tonal assignment occurs with the last syllable in the Cantonese loanforms for ‘disco’ and ‘sandwich’. The last syllable in the loanword for ‘disco’ comes from the unstressed syllable in English. Thus it should receive a low tone and surfaces as the rising tone since it is in the word-final position. But it carries a high tone instead. As for ‘sandwich’, the last/created syllable in the loanform does not undergo high-tone morpheme attachment and remains a low tone. This may be similar to the cases we saw earlier such as ‘cash’ and ‘punch’, that the palato-alveolar consonants may block the high-tone morpheme attachment.

These examples seem to contradict the disyllabic word preference proposed by Silverman (1992). But notice that vowels are inserted in these words in order to preserve the sibilants /s/ and /tʃ/, which are very salient perceptually. As for the consonant cluster that is adapted through deletion, such as ‘brother’ [pa: HH ta: LH] and ‘broker’ [pʰk H ka: LH], the deleted consonant is a liquid, which is not as salient as sibilants. This phenomenon was noted in Yip (1993) that salient segments such as /s/ is never lost in loanword adaptation, even at the cost of violating the disyllabic word form preference.

One word with stress on the second syllable is ‘cocaine’. Previously we saw that the unstressed syllable before the stressed one carries a mid tone, but here it carries the rising tone. The stressed syllable in English is split into two syllables in Cantonese, probably because it is a diphthong. Since these two syllables both come from the stressed syllable in English, they both bear the high tone.

2.3.1. Tri-syllabic English words

Some tri-syllabic words become disyllabic in Cantonese due to truncation or simplified English pronunciation. Others remain tri-syllabic in Cantonese.

2.3.2. Tri-syllabic Cantonese words

The word ‘library’ is tri-syllabic in English according to the standard pronunciation. But it becomes disyllabic in Cantonese as [laj HH ba: LH]. Note that the CC onset of the second syllable is not broken by vowel epenthesis, but by consonant deletion. The last syllable is dropped. ‘Favorite’ is tri-syllabic in the standard pronunciation as well, but it is often pronounced as [fevʰt] in colloquial speech. It seems that this colloquial pronunciation is adapted into Cantonese as [fej HH fʰt L]. The CC in the second syllable is also simplified by liquid deletion rather than epenthesis. The word-final syllable does not carry a rising tone because it is mono-moraic.

We will first look at the tri-syllabic loanwords that have primary stress on the first syllable in English. They are listed in (10).

(10)	<i>English</i>	<i>Cantonese</i>
	saxophone	[s□k H si: LL f□η HH]
	wide-angle	[w□j HH □η HH k□: LH]
	chocolate	[t□y: HH ku: HH l□k H]
	microphone	[maj HH k□: HH f□η HH]

The word ‘saxophone’ has primary stress on the first syllable and secondary stress on the last syllable. In the loanform both stressed syllables receive a high tone. The middle syllable, being unstressed, carries a low tone. The word ‘wide-angle’ is clearly a compound. Thus it receives high tone on the first two syllables. The last syllable is assigned a low tone and then surfaces as a rising tone. The last two words in (10) display an unexpected tonal pattern: the high tone is assigned to the syllables with primary and secondary stress. But the middle/unstressed syllable also bears a high tone instead of a low tone. This phenomenon is similar to the plateauing effect observed in many tone languages (Cahill, 2007). In these languages the tonal sequence /HLH/ or /HØH/ is prohibited. Thus the TBU between the two high tones usually carries a high tone as well. Yet since there are only two such examples in Cantonese, and there are words like ‘saxophone’ that does not undergo plateauing, we are not certain whether such rules exist in Cantonese loanwords.

In (11) we list the tri-syllabic Cantonese loanwords that have primary stress on the second syllable in the English original form.

(11)	<i>English</i>	<i>Cantonese</i>
	commission	[k□an MM mi: HH s□n LH]
	assignment	[a: MM saj HH m□n LH]
	vanilla	[w□n MM l□: HH la: LH]

The rule that the stressed syllable receives a high tone is not violated. The second syllable of all these examples carries a high tone. The unstressed syllable after the stressed one should be assigned a low tone, and it becomes a rising tone if in the word-final position. This generalization also holds true. The unstressed syllable before the stressed one usually bears a mid tone in previous disyllabic cases. For the tri-syllabic words, this rule is also observed. Thus we generally see a mid-high-low tonal contour for the tri-syllabic loanwords that have primary stress on the second syllable in English.

2.4. Quadri-syllabic Cantonese words

In the data we collected, there is only one quadri-syllabic Cantonese loanword that comes from tri-syllabic English word. ‘Strawberry’ is borrowed as [si: LL t□: HH p□: HH lej LH]. Cantonese speakers probably perceived this word as a compound. Hence the stressed syllable of ‘straw’ and ‘berry’ receives a high tone. Epenthesis occurs to break the consonant cluster onset in ‘straw’, and this created syllable carries the low tone. The word-final syllable bears the rising tone. The stress-to-tone patterns in this word are canonical.

3. Summary and Conclusion

Some major tonal rules in the loanwords proposed by previous literature are mostly observed in the present data. For example, the stressed syllable in English usually bears the high tone in Cantonese (Kiu, 1977), and it includes both primary and secondary stress. When a vowel is inserted to break the consonant cluster, the created syllable usually carries the low tone (Silverman, 1992). A high-tone morpheme that indicates colloquial style is attached to the end of most of the loanwords. This morpheme changes the low tone to a rising tone (Silverman, 1992).

However, these rules sometimes fail to account for some loanwords. The stressed syllable in English may not be assigned a high tone if the borrowed word is a verb. The unstressed syllable may sometimes carry a high tone if it is between two syllables with a high tone (cf. plateauing effect). The reason that the unstressed syllable before the stressed one receives a mid tone while that after the stressed one receives a low tone may be due to positional salience. That is, the post-tonic unstressed syllable is perceptually weaker than the pre-tonic one. Thus tonal assignment for unstressed syllables also depends on their position.

The consonants in the English form may interact with the tonal assignment as well. For example, when the final unstressed syllable of the loanword ends in a stop, the syllable is mono-moraic and cannot be attached by a morphemic high tone. Thus the syllable carries an entering low tone instead of a rising tone. When the final unstressed syllable ends in a palato-alveolar consonant, the high-tone morpheme attachment also seems to be blocked.

The tonal adaptation of English loanwords in Cantonese is not just a stress-to-tone mapping. It also involves the consonant types, the morphology (whether it is considered a compound), and the word class (noun or verb) of the borrowed words. A more thorough study would be to consider also the vowel and consonant adaptation to fully capture the interaction of two phonological systems.

REFERENCES

- BAUER, ROBERT and PAUL BENEDICT. 1997. *Modern Cantonese phonology*. New York: Mouton de Gruyter.
- CAHILL, MIKE. 2007. More universals of tone. Ms. SIL. *UC Berkeley Phonology Lab Annual Report* 519. <http://www.sil.org/silewp/2007/silewp2007-007.pdf>
- CHEUNG, HUNG-NIN SAMUEL. 1972. “*Xianggang Yueyu yufa de yianjiu*” [Cantonese as spoken in Hong Kong]. Hong Kong: The Chinese university of Hong Kong.
- CHEUNG, YAT-SHING. 1986. “*Xianggang Guangzhouhua Yingyu yinyi jieci de shengdiao guize*” [On the tone system of loanwords from English in Hong Kong Cantonese]. *Zhongguo Yuwen* 1. 42 – 50.
- DAVIS, STUART and JUNG-YUEH TU. 2007. On word prosody in loanword phonology. Paper given at McWOP 13, Ohio State, Oct. 28.
- HASHIMOTO, ANNA-YUE. 1972. *Phonology of Cantonese*. Cambridge: Cambridge University Press.
- HSIEH, FENG-FAN and MICHAEL KENSTOWICZ. 2008. Phonetic knowledge in tonal adaptation: Mandarin and English loanwords in Lhasa Tibetan. *Journal of East Asian Linguistics* 17. 279 – 297.

- ITO, CHIYUKI, YOONJUNG KANG, and MICHAEL KENSTOWICZ. 2006. The Adaptation of Japanese Loanwords into Korean. In: Hsieh, F-f. & Kenstowicz, M. (Eds.), *Studies in Loanword Phonology*, MIT Working Papers in Linguistics 54, Department of Linguistics, MIT, Cambridge, MA. pp. 65 – 104.
- KANG, YOONJUNG. 2003. Perceptual similarity in loanword adaptation: Adaptation of English post-vocalic word-final stops to Korean. *Phonology* 20. 219-273.
- KENSTOWICZ, MICHAEL. 2001. The role of perception in loanword phonology. *Studies in African Linguistics* 32. 95–112.
- KENSTOWICZ, MICHAEL. 2006. Tone loans: The adaptation of English loanwords into Yoruba. In: John Mugabe, (Ed) Selected proceedings of the 35th annual conference on African Linguistics, pp. 136 – 146. Somerville, MA: Cascadilla Proceedings Project.
- KENSTOWICZ, MICHAEL and SUCHATO, ATIWONG. 2006. Issues in loanword phonology: A case study from Thai. *Lingua* 116. 921 – 949.
- KIM, JUNGSUN. 2005. Double Accent in loanwords of North Kyungsang Korean and variable syllable weight. Ms., Indiana University.
- KIU, K. L.. 1977. Tonal rules for English loanwords in Cantonese. *Journal of the International Phonetic Association* 7. 17 – 22.
- KUBOZONO, HARUO. 2006. Where does loanword prosody come from? A case study of Japanese loanword accent. *Lingua* 116. 1140 – 1170.
- KUBOZONO, HARUO. 2007. Loanword accent in South Kyungsang Korean: A moraic account. *ICPhS XVI*. 1185 – 1188.
- LEE, DONGMYUNG. 2005. Weight-sensitive tone patterns in Loanwords of South Kyungsang Korean. Berkley Linguistics Society (BLS) 31: Prosodic Variation and Change proceedings. University California, Berkley, CA.
- MATTHEWS, STEPHEN and VIRGINIA YIP. 1994. *Cantonese: A Comprehensive Grammar*. London: Routledge.
- PARADIS, CAROLE. 2006. The unnatural /C^hu/(< foreign/Cy/) sequence in Russian loanwords: A problem for the perceptual view. *Lingua* 116. 976 – 995.
- SILVERMAN, DANIEL. 1992. Multiple scansions in loanword phonology: evidence from Cantonese. *Phonology* 9. 289 – 328.
- UFFMANN, CHRISTIAN. 2004. Vowel epenthesis in loanword phonology. PhD dissertation, Universität Marburg.
- WU, HSIAO-HUNG IRIS. 2006. Stress to tone: a study of tone loans in Mandarin Chinese. *MIT Working Papers in Linguistics* 52. 227 – 253.
- YIP, MOIRA. 1993. Cantonese loanword phonology and optimality theory. *Journal of East Asian Linguistics* 2. 261 – 291.
- YIP, MOIRA. 2002a. Perceptual influences in Cantonese loanword phonology. *Journal of the Phonetic Society of Japan* 6. 4 – 21.
- YIP, MOIRA. 2002b. *Tone*. Cambridge: Cambridge University Press.