English Loanwords in Cantonese

I'd like to begin with a few preliminary assumptions concerning the data we'll be looking at. During the course of this talk, I'll provide evidence in support of these assumptions. First, Cantonese speakers do not have access to English phonological representation. Therefore Cantonese speakers must provide the phonetic input with prosodic structure in accordance with their indigenous phonological system. Additionally, when the indigenous phonology is ill-equipped to provide structure, appeals to universally unmarked settings must be made. In particular, we'll see that Cantonese speakers are relying on universal principles of syllable construction as they incorporate English words.

In addition to providing support for these preliminary assumptions, I will provide evidence from truncation strategies that indicates Cantonese speakers perform multiple scansion on incoming forms, and that there is a strong preference for forms to possess two syllables.

The transcription I employ is that of Zhang (1986). Inverted commas represent aspiration. Cantonese forms are based on British pronunciation. For ease of exposition, bracketed English orthography represents the phonetic input.

The table in (2) shows the Cantonese phonetic inventory. I'll have nothing to say here about the transposition of segments from English to Cantonese.

The Cantonese syllable is superficially (C)VX, allowing neither branching onsets nor branching codas.

The Cantonese syllable inventory is subject to certain syllable structure constraints, for example a ban on more than one underlyingly labial segment per syllable, which is discussed in Yip (1989). It is further constrained by accidental gaps in the morpheme inventory: new syllable shapes don't arise due in part to the limitations imposed by the orthography, which is morphemically based. There are exceptions to both these types of limitations, due primarily to the incorporation of loanwords. Nonetheless, native constraints still seem to exert a pressure against incorporating new syllables. Acceptable codas in Cantonese are listed.

The tonal inventory is listed with its traditional numerical notation, in which an increase in numerical value corresponds to an increase in pitch height. I've chosen to employ high, mid and low notation, since these terms are consistent with more recent theoretical developments in tonology. Nonetheless, I make no claims regarding the phonological representation of tone in Cantonese. This notation is intended to reflect phonetic information, and nothing more. So a high tone corresponds to the traditional 55, a mid tone to 33, and a low tone to 22. These are the only superficial tones that play a role in Cantonese loanword phonology. The contour tones will play an extremely limited role in the present analysis.

Contour tones may associate only with -VV and -VS rimes. In other words, sonorant-final syllables possess two TBUs.

It will be important to remember that the Cantonese morpheme is almost exclusively monosyllabic and that Cantonese has no indigenous operations of epenthesis or syncope: morphemes always surface fully intact, even when concatenated. Finally, note that most words in Cantonese, including many loans, are bisyllabic.

We'll now look at the tonal patterns of English loanwords. In stress languages like English there is a correlation between phonological stress and phonetic pitch. In general, primary stress is higher in pitch than other syllables. As Cantonese possesses lexical tone, it appears that speakers interpret English stress patterns as tonal patterns. Note that this is consistent with our original
assumption that Cantonese speakers do not have access to English phonological representation, but instead must provide their own, in accordance with the indigenous phonology.

So English syllables receiving primary stress are perceived as possessing [H] tones, whereas other syllables are perceived as possessing [M] tones. In (4) are some examples. In (5), monosyllabic English forms are interpreted as possessing high tones by Cantonese speakers. In (6), English bisyllabic forms receiving final stress possess the corresponding Cantonese tonal pattern mid-high. Recall that Cantonese syllables permit neither branching onsets nor branching codas. English consonant clusters are either truncated by deleting the second consonant, or repaired by epenthesizing a vowel between the two consonants. Later, we will discuss what motivates these distinct strategies. For now though, note that derived syllables are perceived as possessing [L] tones. I call these syllables "derived" only because they do not exist in the English input. I assume the English cluster is never represented as such in Cantonese. Rather, we'll see that a combination of prosodic and perceptual constraints determine how the phonetic string is phonologically represented.

In (7) are some examples of forms possessing derived syllables, realized with low tones in Cantonese. Looking at the data in (9), the tonal pattern is not the expected high-mid, but rather is high-mid-high. Similarly, the tonal pattern in (10) is not the expected high-low, but is also high - mid-high. I therefore assume that a [H] boundary tone normally attaches form-finally. Yip, in her dissertation shows that Cantonese hypocoristics and certain indigenous truncated forms possess morphemic tone, and so this analysis is not a total innovation. This explains why all forms end with a pitch rise. To explain the fact that we do not get the expected low-high contour on final syllables in (10), I assume a phonetic rule that raises low to mid in this context. This phonetic rule is triggered so that the loanword tonal melody abides by constraints imposed by the indigenous tonal inventory -- Cantonese possesses a lexical mid-high tone, while lacking a low-high tone.

The forms in (11) show that suffixation applies after word building operations. Here, the first two syllables are derived from the English forms [cherry] and [X]. The third attaches lexically. The crucial observation is that the second syllable in each example does not possess a rise, indicating that the boundary tone has not attached here.

Pre-consonantal and word-final English /s/ is always perceived syllabically by Cantonese speakers. These syllables are realized with a low tone. In (13) we see the /s/ in prevocalic s-consonant clusters realized syllabically. In (14) post-vocalic /s/, which cannot be incorporated as a coda in Cantonese, is also perceived syllabically.

Evidence from the tonal pattern of English compounds indicates that the domain of pitch contrast analysis, which I call the PCA domain, is the English free morpheme. In the data in (15), despite superficial pitch contrasts, tone is perceived solely within the PCA domain. This indicates that Cantonese speakers' explicit knowledge of English morphology exerts an influence on their analysis. So, for example, both syllables in the English compound [dockyard], despite superficial pitch contrasts, are realized in Cantonese with high tones.

We'll now turn to truncated forms, which will provide insight into the building of prosodic structure in loanwords. Truncation appears to be limited to a single semantic class -- university subjects. Truncation normally reduces a form to a single binary foot.

The crucial observation in the tonal pattern of the forms in (17) is that the tones realized are based on the full English form, and not based on the syllables present superficially. If the PCA domain were the two syllables realized in the Cantonese form, we would expect a high-low tonal pattern, corresponding to the relative pitch contrast of the two English syllables. Even more
importantly, note that the boundary high tone is not superficially present in these forms.

We can therefore conclude that the PCA domain is established before truncation, the boundary tone attaches before truncation and that pitch contrasts are neutralized as necessary due to constraints imposed by the indigenous toneme inventory.

In other words, there are simply not enough tonal contrasts in Cantonese to accurately accommodate all pitch contrasts perceived, and so, when a syllable which receives primary stress is present, pitch contrasts between unstressed and secondary stressed elements are neutralized.

The generalization to be made, from which all the conclusions just drawn follow, is that the full form is scanned before truncation applies.

Now look at the forms in (18). In (19) the second syllable closes, as the post-vocalic /t/ is an acceptable Cantonese coda. In (20), the syllable remains open, as the following segments -- /s/ in [composition], and /l/ in [psychology] -- are not acceptable codas. Remember that the indigenous phonology doesn't possess any rules of syllable restructuring, as each monosyllabic morpheme always surfaces intact. There aren't any indigenous processes of epenthesis or syncope to trigger syllable restructuring. Yet Cantonese speakers are consistently constructing syllables maximally up to well-formedness in loans -- a strategy that could not have been learned during the initial acquisition process. They must therefore be appealing to a universal principle of syllable construction: syllables are universally constructed maximally up to well-formedness.

These forms also provide further support for our original assumption that Cantonese speakers do not have access to English phonological representation. For example, the Cantonese form for [psychology] shows that Cantonese speakers do not have access to English metrical structure, as this truncated form does not consist of an English metrical constituent, as shown in (21). I'd like to add at this point that there is limited evidence from the indigenous phonology that the binary foot plays a role, in that most words in Cantonese are bisyllabic, consisting of two monosyllabic morphemes.

The treatment of prevocalic consonant-liquid sequences provides further evidence for the binary foot. The near-minimal pairs in (22) show that bisyllabicity is realized whenever possible. In [print], the liquid is salvaged, and the form surfaces with two syllables, whereas in [printer], the liquid deletes, and the form remains bisyllabic. Therefore, a full syllable count must be performed on the first scansion. I propose that in the phonetic input, sonority peaks, and phonetically salient segments that are otherwise unsyllabifiable are supplied with syllable nodes as the first scansion proceeds. After the form is fully scanned and a full syllable count is made, liquids are either salvaged or deleted in accordance with the preference for bisyllabicity. The derivation in (23) shows how this strategy is applied in various paradigms.

Observe that the final /t/ in [print] is not present in the Cantonese surface form, despite the fact that its salvation through epenthesis would result in a preferred bisyllabic form. I assume that obstruents following sonorant consonants in form-final position lack sufficient phonetic salience to be perceived by Cantonese speakers, and are consequently never represented. This insufficient salience may be due to the fact that these segments are often unreleased when spoken in English, combined with the fact that the preceding segment, /n/, syllabifies so that a maximally well-formed syllable is constructed. So compare the /t/ in [print] with the /t/ in [printer]. This second form possesses a released /t/, which syllabifies to its right, and is therefore more likely to be perceived.

So let's look at the data in (26). In (27) we see edge-in plosive sonorant clusters. Onset clusters are salvaged, while coda plosives are not realized. In (28) we see edge-in fricative-sonorant clusters. Again, onset clusters are salvaged, but coda obstruents don't surface. (29) shows edge-in
plosive-fricative clusters, which are also truncated in coda position. In (30) however, sonorant-
sonorant coda clusters are salvaged by epenthesis. These form final sonorants are presumably more
salient, and can therefore be perceived and subsequently realized by Cantonese speakers.

We've seen several phenomena that suggest a preference for bisyllabicity. I'd like to
conclude that bisyllabicity is the preferred form for loanwords, just as it is the preferred form in the
indigenous vocabulary.

However if the input is provided with more than two syllable nodes, bisyllabicity is forfeited.
Furthermore, if a monosyllabic input can be fully accommodated, bisyllabicity is forfeited. Finally, if
a monosyllabic input possesses consonants which lack sufficient phonetic salience to be perceived,
bisyllabicity is forfeited.

Note that we cannot conclude that the binary foot constitutes the minimal prosodic word in
Cantonese. There are some monosyllabic lexical forms in both the indigenous vocabulary, and, as
we have seen, in the loan vocabulary. Therefore, a "preference" for bisyllabicity is the strongest
claim I can make at this point.

In order to make my analysis more clear, I'll briefly take you through some derivations,
shown in (31). The input consists of an unanalyzed phonetic string, represented in English
orthography. On the initial scansion, syllable nodes are provided at sonority peaks. Cantonese
speakers provide indigenous segments, and establish the domain or domains of pitch contrast
analysis, in which lexical tones are perceived.

On the second scansion, full prosodization proceeds. Note that the PCA domain and the
domain of further prosodic analysis are fully independent of one another. Despite the fact that the
forms [floor] and [show] are treated as free morphemes for the purposes of tone, the treatment of the
initial cluster shows that syllabification and subsequent cluster strategies are dependent upon the full
form, which contains more than one PCA domain. As the full form is bisyllabic, the liquid in [floor]
deletes.

Also, the boundary tone attaches if the final syllable does not already possess a high tone.
Finally, truncation applies when appropriate, retained syllables being constructed maximally up to
well-formedness.

We have now seen evidence for our initial assumptions that
Cantonese speakers do not have access to English phonological representation, and that appeals to
universal strategies are made when the indigenous phonology is ill-equipped to licence material.

We have also shown that multiple scansion are performed on loanwords, and that the binary
foot may play a limited role in Cantonese phonology.

Finally, we have seen that phonological stress and phonological tone may be acoustically
correlated in terms of phonetic pitch.

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