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# A Constraint-Shifting Account of Loanword Adaptation: Evidence from the Early Stages of Dissemination

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## 1 Introduction

This study empirically examines whether a loanword is fully adapted at its dissemination and whether the disseminator's amount of L2 experience affects the degree of initial adaptation. A nonce loanword dissemination task is performed in which subjects are introduced a nonce word in the source language (Japanese) and then elicited to utter it in conversation in the borrowing language (English). Subjects' pronunciations do not fully resemble the form of established loanwords based on a similar source form, instead exhibiting a stronger faithfulness to the source form.

It is proposed that the phonology undergoes constraint shifting due to a PRESERVATIONAL STYLE activated at dissemination. Data are then used to test between this hypothesis and that of loan-specific constraints. Surrounding words native to the borrowing language are found to exhibit a heightened faithfulness similar to that of the newly disseminated nonce loanword. Due to this observation, it is concluded that a loan-specific mechanism does not adequately capture loan adaptation at dissemination.

## 2 Background

Much of the literature on loanword phonology is of a certain formula. Analyses take the forms of established loanwords and treat them as the output of the perceptual faculty and borrowing language grammar, with the source language form as the input. This, however, carries the implied assumption that loanword adaptation is the result of a *single pass* through the grammar of a *single borrowing language monolingual*. Previous research suggests this assumption may be untenable.

One of the few studies examining loanwords in a variationist framework is Poplack, Sankoff, and Miller's (1988) study of English loanwords in Canadian French, which finds that not all loanwords are pronounced in a fully adapted form (i.e. fully complicit with the borrowing language phonology). Younger, more innovative loanwords are pronounced more English-like than older, more established loanwords. Also, speakers of "low" English proficiency are more strongly inclined to adapt loanwords to the Canadian French phonology than those of "high" proficiency. Speakers of high proficiency are also found to use loanwords more, and especially newer ones.

These results suggest that new loanwords are not immediately adapted into the borrowing language phonological system. They also suggest that those of higher proficiency are *less* likely to adapt, while *more* likely to use younger, more innovative loanwords. Following this logic, loanword adaptation appears to be more accurately considered as a chain, with those of higher proficiency more likely to first disseminate a loanword. As argued by Paradis and LaCharité (1997), dissemination and initial adaptation must be through a bilingual. The form then progressively adapts as the loanword spreads and is used more by those of lower source language proficiency.

Davidson's (2006, 2007) experimental studies take a chain-like approach to loanword adaptation. In the first (2006), Davidson elicits English speakers' production of nonce words with illicit complex onsets (e.g., stop-stop cluster) showing a strong, though not categorical, trend by which speakers produce a *phonetic* schwa-like vocoid between the two illicitly juxtaposed segments due to gestural mistiming. This vocoid is significantly different in multiple aspects from that of a phonological schwa. In the second (2007), some recorded utterances from the first are used for an auditory perception experiment. In both transcription and discrimination tasks, the results from hearing the phonetic vocoid are fairly split between perceptions as a cluster /CC/ and those with a phonological schwa /CəC/, with a slight preference for the latter. This suggests that the initial form

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at dissemination could have a chain reaction on the resultant established adaptation, with lesser, phonetic adaptations becoming full, phonological changes further on in the chain.

While Davidson's experiments do well at capturing the chain aspect of adaptation, therefore abandoning the one-pass assumption, there are other factors still missing. The subject pool of the 2006 study was limited to those with *no* experience with a language containing the examined onset clusters, and therefore still working under the borrowing-language-monolingual assumption. The procedure involved subjects repeating nonce words presented orthographically and auditorily, not uttering them within the borrowing language speech stream like in a loanword's real-world usage.

This experiment intends to further challenge current assumptions about loanword adaptation and examine initial adaptation by those *with* some L2 experience in the source language. The methods (see next section) attempt to simulate a loanword's dissemination in a situation more naturalistic than prompted repetition. The phonological variable at hand for this study is the Japanese palatalized velar stop /kʲ/. In established Japanese-to-English loanwords, this secondary palatalization has been adapted into a full, high front vowel: e.g., *Tōkyō* [to:kʲo:] → ['toʊ.ki.ʊ], *Kyōto* [kʲo:.to] → [ki.'ʊʊ.roʊ]. The following experiment seeks to examine 1) whether subjects fully adapt a nonce Japanese loanword with source form /kʲ/ to the [ki.] form found in established loanwords, and 2) whether subjects with more Japanese L2 experience produce the sequence as something closer to the native [kʲ] sequence.

### 3 Methods

#### 3.1 Participants

Subjects were twelve undergraduate students enrolled in Japanese language coursework at a private university on the East Coast of the United States. Six were enrolled in their first semester (beginning) and six in their third (intermediate). All were native speakers or early learners (before 5yrs old) of English. None had experience with any other language exhibiting secondary palatalization such as that studied here. Gender was balanced in the intermediate group, while not quite in the beginning group (F=4; M=2). Various ethnicities were represented but not evenly within and across groups. Six native Japanese speakers were recruited to provide prototypical forms of the target tokens for comparison.

#### 3.2 Materials and Procedure

A short story in Japanese was presented to subjects in written form.<sup>1</sup> This medium was chosen to avoid the potential effects of phonetic perception/discrimination. The story involved a teacher and students deciding where they will go for an upcoming class trip. The students debate between two possible destinations, arguing which is the better choice. The two destinations were nonce toponyms created for the study, the target tokens: *Wakyōsei* [wa:kʲo:.se:] and *Shokyūmi* [ʃo.kʲu:.mi] (phonetic forms as if uttered by a native speaker). The word *samurai* was also included, so as to analyze if subjects would exhibit any propensity to pronounce even established loanwords more source-like and what effect (if any) this might have on their pronunciation of new ones.

When finished reading the story, subjects were asked to recount and discuss it in English in order to elicit utterances of the nonce toponyms in the English speech stream, thus resembling loanword dissemination. In recruitment, subjects were told that the study regarded the expression in one language of memories stored in another so as to avoid any consciousness of the specific factor being examined: their pronunciation. Native speakers were asked simply to utter the target words in repetition. Participants' speech was audio-recorded using a head-mounted microphone.

#### 3.3 Analysis

Utterances of the nonce toponym *Wakyōsei* were extracted from non-native subjects' English

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<sup>1</sup>This written form included kanji, hiragana, and katakana systems. All kanji were presented with furigana, a small superscript hiragana transcription of the kanji, to ensure comprehension was not an issue. Course instructors confirmed the story to be comprehensible to students at the lowest level.

speech (and native subjects’ prompted repetition). Tokens were analyzed for the production of the palatalized velar stop by both auditory coding and acoustic measurement with Praat software. Utterances of *samurai* were also auditorily assessed by the author for source-like pronunciation, with attention paid to the first vowel and pronunciation of the rhotic.

For acoustic analysis of the palatalized velar stop, the F2 transition was used. Figure 1 is a spectrogram of sequences [kou], [k’io], [kjou], and [ki.ou], as produced by the author. For the latter three, the F2 drop (front-to-back movement) is progressively later and less steep.<sup>2</sup>

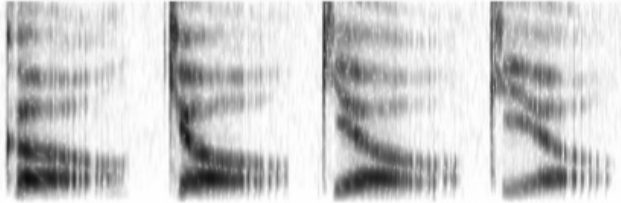


Figure 1: Spectrogram of [kou], [k’io], [kjou], [ki.ou].

To analyze this drop, the duration from voicing onset to the start of frication in the /kio:s/ sequence in *Wakyōsei* was measured. F2 measurements were taken at the voicing onset and the following four deciles of that duration (henceforth, points 1–5). Another measurement was taken at the earliest point visually identified by the author as a steady state of F2 after reaching the [o] vowel and before any offglide (henceforth, the steady [o] point).

## 4 Results

Given the nature of the task, the token count was not consistent across subjects. In fact, some subjects avoided uttering the nonce loanword at all (see Discussion). A few tokens were excluded due to voice quality or due to the subject picking up the written story and reading the word, thus not being considered part of the natural English speech stream. The final token count, subject count, and distribution are in Table 1.

Level	Beginning	Intermediate	Native
Subjects	5	3	6
Tokens	9	14	23

Table 1: Final Token Count and Distribution.

### 4.1 Auditory Coding

To get a sense of whether the degree of adaptation could be auditorily judged, two disinterested, trained, English-L1 phoneticians were recruited to auditorily code realizations of the *Wakyōsei* tokens as uttered by a native or non-native Japanese speaker, and then as a [k’], [kj], or [ki.] realization. For the first, coders were consistent at identifying tokens as native vs. non-native, misidentifying only 1 non-native token each as native, and only 5 native tokens total as non-native (with 0% agreement). Coders reported that vowel qualities were strong influences in this judgment.

However, in judging [k’] vs. [kj] vs. [ki.], coders agreed on only 20% of the non-native tokens. All of these agreements converged on the [kj] form. This suggests that 1) it is difficult for English speakers (even trained phoneticians) to auditorily distinguish between these three forms, and 2) tokens uttered by non-native speakers ended up sounding like something in between the source [k’] form and the [ki.] form found in established loans. This also confirms that factors such as vowel quality may have played a larger role in native vs. non-native judgments than the target sequence.

<sup>2</sup>This being the most salient differentiation between realizations of the high front vocoid is why the other nonce toponym, *Shokyūmi*, is not analyzed here. Both the Japanese and American English /u/ in this case would be pronounced more frontward than /o/, making direct comparison difficult. Future study, however, would benefit from comparing these two following vowels, given that English does have diphthongal /ju/ (Jensen 1993) and there should, therefore, be less of a phonological inclination to adapt to [ki.u].

Listening to all utterances of *samurai*, the author concluded that this was always pronounced in its established, adapted form. The first vowel was always a low, front [æ] and the rhotic was always [ɹ]. This factor was thus excluded from statistical analysis (though see Discussion).

#### 4.2 Acoustic Analysis

Given the low reliability of auditory distinction, we turn to acoustic analysis. The data in Figure 2 are the logarithmic differences between the F2 measurement at points 1–5 and that at the steady [o] point for each token, averaged across each speaker and then each group. This was made relative to the steady-state [o] to capture that the transition speed is what is being examined here, and logarithmic to normalize across F0s. For comparison, there is also the measurement of one utterance by a subject that sounded closest to an archetypical Anglicization (i.e. [wa.ki.ˈoʊ.seɪ]), agreed upon as such by the author and one coder.

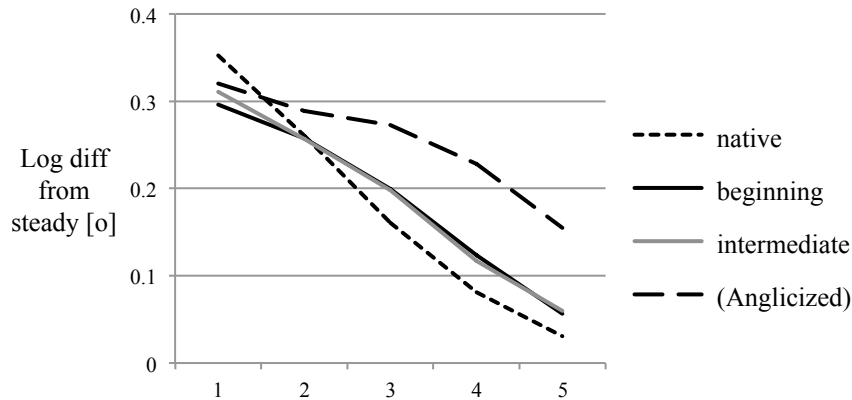


Figure 2: F2 Trajectories of *Wakyōsei* Productions.

The native group’s F2 trajectory starts farther from and ends closer to the steady [o] F2, with a steeper fall. The exemplary Anglicized token’s trajectory remains high much longer, steepening later with a more gradual descent that does not come as close to the steady [o] F2 by point 5.

The non-native groups’ trajectories lie somewhere between the native and Anglicized; though, for the most part they seem to resemble the native trajectory more so than the Anglicized. Therefore, as hypothesized, subjects’ production does not resemble the form of established loanwords. Counter to the hypothesis, the two non-native groups seem to differ little from each other.

A repeated measures ANOVA test of within-group effects between the three Japanese experience levels (including native) and these measurements reveals an insignificant effect ( $p=.068$ ), though approaching significance. Given the low token count, it would be beneficial to see if this remained with a larger token set.

#### 4.3 Conclusions

The acoustic results confirm what the auditory coding suggested: subjects’ pronunciations fell somewhere between the source-like [kʲ] and fully adapted [ki.] and, actually, appear to more closely resemble the prior. Therefore, this nonce loanword, introduced in Japanese writing and disseminated in English speech, does not appear to have been fully adapted to the form of established Japanese-to-English loans, at least in this experimental dissemination setting.

Regarding the native [kʲ] pronunciation, not only is the slope steeper, but it also starts farther away from the final steady [o] F2 and ends up closer to it.<sup>3</sup> Non-native subjects’ pronunciations seem to resemble the native trajectory more than that of the archetypical Anglicized token: the

<sup>3</sup>One thing to note is that the Japanese [o] may be farther back than that of American English. However, this measurement was made conservatively relative in that regard. That is, with the Japanese [o] farther back, the trajectory would have even farther to travel. So the fact that the native trajectory in Figure 2 still is steeper and ends closer serves as strong evidence for a faster transition.

descent seems to start right away, just not starting with quite as high an F2 and not traveling as fast. By these observations, what the subjects seem to have produced is a [kj] sequence.

In terms of L2 experience, the results are somewhat surprising. The beginning and intermediate groups' results are quite comparable to each other, suggesting that the difference of two semesters of coursework did not have much effect. However, both groups' averages seem to resemble the native [k<sup>i</sup>] trajectory more closely than the archetypical Anglicized [ki.] form. Therefore, even these groups, with Japanese L2 proficiency hardly close to being called fluent or near-native, did not fully adapt the loan at dissemination.

## 5 Theoretical Representation

As discussed above (Section 2), the one-pass assumption of adaptation appears flawed. In Poplack, Sankoff, and Miller's (1988) variationist study, younger loanwords are less fully adapted into the borrowing language phonology, and speakers of high source language proficiency preserve loanwords' source forms to a greater degree, even if not complicit with the borrowing language phonology. The results here suggest that even speakers of relatively low source language proficiency are disinclined to fully adapt the disseminated nonce loanword. In the following section I present an analysis of the relevant phonology of the borrowing language based on native words and established loanwords, and then I discuss why it alone cannot account for the findings above.

### 5.1 The Borrowing Language System

First, we must consider the underlying representation (UR), the input to the grammar. By presenting the stimuli in written form, the methodology used here largely intends to avoid the debate of adaptation by perception (e.g., Peperkamp and Dupoux 2003) vs. phonology (e.g., Paradis and LaCharité 1997): i.e., before vs. after UR storage. By the outcome, however, we must conclude that the subjects did not store the word in a fully adapted /ki/ form, which would have been fully licit and thus not changed in production to [kj]. We must assume that subjects at least stored this as a /kj/ sequence, if not as /ki/. I will assume that these students at a fairly early stage are not yet able to store the featural specification of the /ki/ form. Along the lines of Best's (1994) perceptual assimilation model, learners may find [kj] to be the most acoustically similar representation, which they seemed to produce, suggesting this is also what they stored. I will argue that speakers of American English do have the features available to store the [kj] sequence but that American English phonotactics do not generally allow its production.

Vowel and glide counterparts [i, j] and [u, w] appear in environments near-minimally paired, both segmentally and prosodically: e.g., *millennium* [mi.'lɛ.ni.əm], *onion* ['ʌn.jən]; *duet* [du.'ɛt], *dwel* ['dwɛl]. I will therefore assume that English does featurally distinguish between glides and vowels with the [±vocalic] feature (following Padgett 2008, cf. Selkirk 1982).

Glides can appear in complex onsets but seemingly not homorganic ones. For example, [w] can appear in a complex onset, such as in *tweed* [twid] and *quota* ['kwou.rɑ]; however, [w] does not appear following labial onsets (Moreton 2002).<sup>4</sup> In some cases, though rare, we see [j] in such a position, as in the variable words *piano* ['pjæ.noʊ]~[pi.'æ.noʊ] and *fjord* [fjɔɪd]~[fi.'ɔɪd], both labial preceding segments. But in the loanword *Kyōto* with a lingual onset, we see an adaptation to a vowel instead of a glide [ki.'oʊ.roʊ], in spite of both orthographic influence and the source form's [k<sup>i</sup>] onset. The exception would be words like *cute* [kjut]; however, it has been argued that the /ju/ sequence should be treated as a monomoraic diphthong (Jensen 1993, Davis and Hammond 1995), therefore not the [−vocalic] /j/ of concern here that appears before other vowels.

The apparent pattern is that [−vocalic] [j] is disallowed after lingual onsets and [w], after labial ones. The following Optimality-Theoretic analysis expresses this using the constraints in (1), in addition to standard MAX and DEP constraints. To start, in the tableau in (2) we see that (a) American English does not bar consonant-glide (CG) onsets, but (b) it does disprefer homorganic ones over its faithfulness to the [±vocalic] feature status.

<sup>4</sup>Some Spanish loanwords (e.g., *Buena Vista* [bwe.nə.'vis.tə]) seem an exception to this, while others don't (e.g., *Puerto Rico* [pɔɪ.rɔ.'i.koʊ]). I will still assume this homorganicity constraint, apparent in both native and loanwords (if not categorically applied in the latter).

- (1) a. IDENT[voc]: One violation mark per [ $\pm$ vocalic] feature in the input corresponding with an output [ $\pm$ vocalic] feature of the opposite status.  
 b. \*<sub>σ</sub>CG: One violation mark per syllable-initial consonant-glide sequence.  
 c. \*<sub>σ</sub>CG-HOMORG: One violation mark per syllable-initial [C<sub>[Ling]</sub>] or [C<sub>[Lab]</sub>W] sequence.

(2) a.

/twid/	MAX	DEP	* <sub>σ</sub> CG-HOMORG	IDENT[voc]	* <sub>σ</sub> CG
→ twid					*
tu.id <sup>5</sup>				*W	L
tə.wid		*W			L
tid	*W				L

b.

/kjoto/	MAX	DEP	* <sub>σ</sub> CG-HOMORG	IDENT[voc]	* <sub>σ</sub> CG
→ ki.o.to				*	
kjo.to			*W	L	*W
ki.jo.to <sup>5</sup>		*W		L	

There are cases of word-medial [j] preceded by a lingual consonant, such as in *Kenya*. However, in these cases the preceding consonant can be licitly parsed as the coda of the preceding syllable: [ˈkɛn.jə]. In a case like *Tōkyō*, the [k] is not allowed to be parsed into the preceding coda; this coupled with the constraint against a homorganic CG onset forces the glide to be changed to its [+vocalic] counterpart. The tableau in (4) demonstrates this using the fixed-ranking scalar constraints in (3) regarding the steepness of heterosyllabic sonority rises (Gouskova 2004). (I hereby assume MAX and DEP to be undominated by the constraints relevant to this analysis.)

- (3) a. \*T.G: One violation mark per heterosyllabic sequence of a voiceless stop and glide.  
 b. \*N.G: One violation mark per heterosyllabic sequence of a nasal stop and glide.

(4) a.

/kɛnjə/	*T.G	* <sub>σ</sub> CG-HOMORG	IDENT[voc]	*N.G	* <sub>σ</sub> CG
→ kɛn.jə				*	
kɛ.njə		*W		L	*W
kɛ.ni.ə			*W	L	

b.

/tokjo/	MAX	DEP	* <sub>σ</sub> CG-HOMORG	IDENT[voc]	* <sub>σ</sub> CG
→ to.ki.o				*	
to.kjo			*W	L	*W
tok.jo	*W			L	

The constraint ranking in (4) is the usual state of the American English phonology. However, recall from Section 4 that the output by subjects of the nonce loanword *Wakyōsei* is best classified as a [kj] sequence. Were an input of /...akjo.../ passed through the grammar in (4), though, the output should be a [ki.] sequence. I turn to accounting for this discrepancy in the next section.

## 5.2 The Preservational Style at Dissemination

In these data, the new, nonce loanword behaves differently from native words and established loanwords. The appearance of the divergent /...akjo.../ → [...a.kjo...] output<sup>6</sup> observed here suggests that, in this evaluation, IDENT[voc] outranks \*<sub>σ</sub>CG-HOMORG. But what is the cause of this re-ranking? I propose that this is the result of constraint shifting due to the activation of a PRESERVATIONAL STYLE, which I will detail here. By “style”, I refer to Boersma and Hayes’ (2001, Appendix C) proposal of “style sensitivity” in Stochastic OT, as defined in (5):

<sup>5</sup>I will not assume that what rules out this candidate is the resultant hiatus. Davidson and Erker (2014) find that American English is surprisingly permissive of hiatus without any phonetic evidence of glide insertion, as often assumed. Therefore, nor will I assume that [ki.jo.to] is the established adaptation of *Kyōto*.

<sup>6</sup>Subjects’ output could also have been [...ak.jo...], but determining which would require more fine-grained phonetic analysis. I will proceed with the analysis necessary to account for the [...a.kjo...] output.



- (5)  $SelectionPoint = RankingValue + (StyleSensitivity \cdot Style) + Noise$ , where...
- SelectionPoint*: final value dictating where constraint stands in strict-dominance ranking upon EVAL
  - RankingValue*: constraint’s base value (center of its bell curve of variability)
  - StyleSensitivity*: how sensitive constraint is to whatever style is active
  - Style*: how strongly activated the style is ( $0 \leq x \leq 1$ )
  - Noise*: random number from bell curve distribution centered at 0

I propose that only faithfulness constraints are sensitive ( $StyleSensitivity \neq 0$ ) to the preservational style. This *StyleSensitivity* is positive, meaning that faithfulness constraints are *raised* when this style is activated. In these data, this raising results in IDENT[voc] outranking \*<sub>o</sub>CG-HOMORG, and thus producing the [...a.kjo...] output (cf. tableau in (4)).

This idea of heightened faithfulness is not a new proposal. Coetzee and Kawahara (2013) observe a phonological effect of frequency: words of higher frequency tend to undergo more phonological neutralizations. In a Noisy Harmonic Grammar model, they propose that the bell curve of noise in the weighting of faithfulness constraints is skewed upward for less frequent words and downward for more frequent ones. In fact, I propose that this frequency effect is a major component of the preservational style. The NEWNESS of young, freshly disseminated loanwords brings this about: brand new words are inherently less frequent in the borrowing language than established ones, which induces an upward shifting of faithfulness constraints.

However, we may not be able to apply this equally across all faithfulness constraints. Paradis and LaCharité (1997) observe that, cross-linguistically, loanwords exhibit a preference for epenthesis to avoid phonotactically illicit sequences. This preference can be strong enough to diverge from the behavior of native words. For example, Smith (2006) points out that in modern Japanese loanwords, consonant clusters illicit in Japanese are resolved via epenthesis, whereas consonant clusters in native words brought about by morphological concatenation (e.g., a consonant-final root and consonant-initial suffix) are resolved via deletion. Upward shifting of faithfulness constraints does not account for this observation. If both DEP and MAX were to simply shift upward by an equal degree, this wouldn’t explain the change to a preference of epenthesis over deletion in Japanese loanwords. I propose that this inclination to preserve rather than delete is an effect of the FOREIGNNESS of loanwords. Weinberger (1994) presents the ‘recoverability principle’ in L2 acquisition: if one is unsure as to what features (or even phonetic-level cues: Davidson 2007, Kang 2003) are more expendable, they are inclined to keep as much as possible to avoid ambiguity, even if having to add some new material to make it more pronounceable. This can be represented as an asymmetry in constraints’ *StyleSensitivity* to this style, with DEP a candidate for less sensitivity.

**5.3 Shifting vs. Loan-Specific Constraints**

A different approach to explaining divergent loanword behavior is Smith’s (2006, 2009) proposal that there are loan-specific (SB: Source-Borrowing) versions of faithfulness constraints which can be ranked differently from their Input-Output (IO) counterparts. In the case of Japanese, Smith argues that the MAX-SB constraint is ranked higher than both its IO counterpart and both versions of the DEP constraint, contrary to the relative ranking of the two IO constraints, as demonstrated in (6) with native word violations expressed as \* and loanword violations, as °.

(6)

/...VCCV.../	MAX-SB	*CC	DEP-SB	DEP-IO	MAX-IO
Loan → ...VCVCV...			°	* °	
Native → ...VCV...	°				* °
...VCCV...		* °			

If we applied this proposal to the data at hand, it could be that there is an IDENT[voc]-SB constraint ranked higher than \*<sub>o</sub>CG-HOMORG, which would successfully predict the [...a.kjo...] output. I will argue against Smith’s approach on theoretical grounds and then present empirical data challenging it, in favor of the above proposed shifting of the very same IO faithfulness constraints.

For one, in the present data new loanwords are behaving differently than established loan-

words. Smith’s proposal predicts no such difference. The preservational style account, on the other hand, remains consistent with the idea of gradual loanword adaptation and can capture the observable differences between new and established loanwords. Both the newness and foreignness factors this style comprises logically lessen as a loanword’s use becomes more frequent and widespread in the borrowing language. So too, then, must the *Style* part of the equation lessen. As a loanword becomes more established, the preservational style’s activation weakens, and loanwords are more strongly forced into a form fully complicit with the usual state of the borrowing language phonology. However, the *effects* of this do not depend on constant, parametric activation every time a loanword is uttered. Effects on the pronunciation at earlier stages can become manifest in the underlying representations further on in the dissemination/adaptation chain, as in Davidson’s (2006, 2007) studies.

Also, the SB constraint account provides too much freedom. Smith does not detail how the ranking of SB constraints is induced. She suggests that these rankings may be learned by “convention”, based on established loanword behavior. However, this still requires explanation on the origin of such a convention and on why conventions cross-linguistically converge on (or at least prefer) certain patterns. The DEP-SB constraint could just as easily be ranked above MAX-SB.

I propose that there is a testable difference between Smith’s SB constraint approach and the preservational style. The idea of loan-specific constraints limits observable effects purely to loanwords. If IO faithfulness constraints are shifting, these are the very same constraints that apply also to native words. I examined the surrounding English speech with the hypothesis that native words neighboring the newly disseminated loanwords may undergo a similar effect of heightened faithfulness. Previous variationist work (e.g., Scherre 2001, Tamminga 2014) finds that variable phenomena tend to “persist” over certain spans. That is, tokens of variation are more likely to turn out one way when surrounding tokens of the same variable exhibit that same output, suggesting that variation of the grammar is not necessarily immediate and parametric but perhaps more gradual. I treat this as support for examining a function word neighboring a content constituent that may trigger a stylistic effect on the grammar.

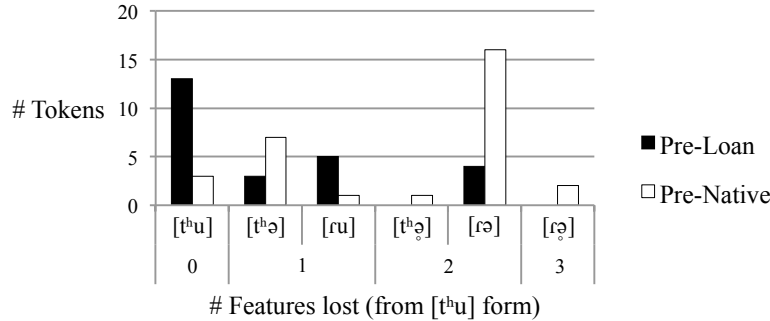


Figure 3: Forms of locative *to* across following word type.

Due to the nature of the story read by subjects, the subsequent recounting in English contained many utterances of locative *to* both before native English words and before the experimental nonce loanwords: e.g., “If they go **to** *Shokyūmi*, they can go **to** the beach.” A trained phonetician, unaware of the hypothesized results, was recruited to transcribe all tokens of locative *to* in participants’ speech, extracted along with the preceding and following few words for phonetic context. Unlike the auditory coding task above, this phonetician was instructed to use Praat so as to transcribe narrowly and accurately. The data in Figure 3 are the different forms locative *to* took, separated by following DP (native English word vs. nonce loanword) and quantified by features lost from the maximally faithful [tʰu] form. Features examined were vowel quality, vowel voicing, and form of the initial consonant. While these results are tentative, as analysis of prosodic situation is not taken into account here, locative *to* seems to be pronounced in a more faithful form when preceding a nonce loan than when preceding a native English word. A Fisher-Freeman-Halton Exact test was performed across following environment (pre-loan, pre-native) and features lost (0, 1, 2, 3) revealing this effect to be significant:  $\chi^2 = 15.751$ ,  $p = .001$ .

By these data it appears that a neighboring native word undergoes an effect similar to the

nonce loanword above. Both exhibit a higher faithfulness: the loanword itself preserves a feature that is otherwise dispreferred in that environment, and the locative *to* preserves more features and undergoes less neutralization when preceding a nonce loanword than when preceding a native word. This lends support to the idea that stylistic changes in the grammar extend beyond the word boundary. This also challenges Smith's proposal of loan-specific constraints. If native words undergo similar effects, IO constraints are better explained as the locus of such effects.

## 6 Discussion

This study's results corroborate the findings of other experimental and variationist studies that loanword adaptation is not completed in a one-pass manner. The production of a nonce loanword took an acoustic form between the source language form and that of established loanwords. There seemed to be no relative effect of the amount of L2 experience on subjects' production; however, *both* groups at a rather early stage of Japanese L2 learning diverged from producing the expected form. The form produced is not generally licit in American English phonotactics (while featurally available), thus suggesting a difference in the grammar from the usual state. Comparing a constraint-shifting approach with Smith's (2006, 2009) approach of loan-specific faithfulness constraints, I examined the surrounding speech. This examination revealed a native English function word (locative *to*) exhibiting a significantly more faithful pronunciation when preceding nonce loans than when preceding native English words. By this, I concluded in favor of the approach of upward shifting of faithfulness constraints caused by the activation of the PRESERVATIONAL STYLE.

Since it is difficult, if not impossible, to track a loanword from its initial dissemination, experimental methods should try as much as possible to replicate real-world dissemination. This method more closely resembles loanword dissemination than previous methods. It is most logical to assume that a disseminator has at least *some* experience in the source language. It is also valuable to observe loanword dissemination within a communicative task in the borrowing language given that this 1) more accurately reflects the usage of loanwords as such, 2) lessens any concern that subjects are paying unrealistic attention to their pronunciation (compared to repetition tasks), and 3) allows for examination of surrounding native words, further motivated by the results here.

The theoretical account proposed brings up further questions. Of course, fine-grained details of the model (e.g., shifting vs. noise skewing) would require the analysis of a much more robust corpus of data. And, as mentioned earlier, the specifics of constraint sensitivity are up for debate. The cross-linguistic epenthetic inclination in loanword adaptation motivates formal expression of Weinberger's (1994) recoverability principle, such as the DEP constraint being less sensitive to the preservational style. Further examination of cross-linguistic loanword trends may guide the consideration of asymmetries in constraint sensitivity. Future analyses should test if these asymmetries hold in surrounding native speech. The observed effects on surrounding speech also raise the question of how far from their locus such effects are still observable.

Finally, both this method and the topic of loanword adaptation at large call for attention to sociological aspects. Recall that not every subject even *did* utter the nonce loanword in question. Non-utterers may have been those of lower proficiency or less confidence in their Japanese. And subjects did know that the interviewer spoke some Japanese, which could have an enhancement effect on those factors, along with the interview setting. Besides the components of NEWNESS and FOREIGNNESS, there may also be a factor of more agentive preservation: a *desire* to preserve the source form. There could be effects of attitude towards the source language or engagement with it outside of the classroom. Recall, though, that subjects produced this more source-like form in spite of unequivocally pronouncing the established loanword *samurai* in its full Anglicization, therefore not suggesting some propensity to pronounce all loanwords markedly source-like. This also brings up the more pragmatic methodological issue of robustness. Future versions or editions of this method will want to increase the token count in some way. A method that maintains the goal of communication over that of pronunciation is desirable: e.g., Brown et al.'s (1983) map task. However, experiment design should always consider whether anything is being lost from the representativeness of loanword dissemination when utterances are being more strongly elicited from those who, otherwise, may not have been disseminators to begin with.

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