

Emergence and acquisition of rules in recent morphological processes

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Across languages, morphological processes which exhibit perfect regularity and no variability are rare. In the creation of novel forms, speakers therefore typically have some freedom to choose between forms (Haber, 1976; Fehringer, 2004; Säily, 2011; Thornton, 2012). Recent studies have shown that the strategies that speakers use in the creation of novel forms depend on certain characteristics of the morphological process, particularly the type and degree of variability in patterns shown by existing forms (Dawdy-Hesterberg, 2014). Our research addresses the question of the transition from lexical learning to rule abstraction in morphological processes that have appeared or become productive recently in a language, and which present a limited list of existing forms from which speakers could abstract a rule. We explore this issue through an experimental task in which speakers were asked to create novel forms using a recent but productive morphological process in Japanese: the abbreviation of compound loanwords. We argue that in recent processes, while a rule is quickly abstracted from the dominant pattern, less general patterns remain unnoticed by speakers even though they are in principle predictable from existing forms. In other words, speakers are unable to fully reproduce the predictable regularity of attested forms in their creation of novel forms.

In Japanese, Compound Abbreviated Loanwords (hereafter CALs) are formed by blending two words of foreign origin. One well-known example is the word ‘pokemon’ which is derived from the two English words ‘pocket’ and ‘monster’ (pronounced *poketto* and *monsutaa* in Japanese). The general principle for creating a CAL is to combine the first two morae¹ of each word. However, in recent borrowings Japanese speakers tend to abbreviate more often in three morae (like in ‘potato chips’ > *po.te.chi*). In a previous study comparing lexicons of CALs from different time periods, we observed that the increase in three mora abbreviations was due to the regularization of the treatment of contradicting phonological constraints. There is one notable phonological condition that triggers such a contradiction: the presence of /R/ or /Q/ as the second mora of the second word. In Japanese phonology, /R/ traditionally represents the lengthening of the preceding vowel, and /Q/ represents the gemination of the following consonant. Those two moraic segments are subject to certain phonological constraints, namely they are dispreferred word-finally. This constraint is especially strong for /Q/ since it has no expected pronunciation when it is not followed by a consonant. When one of these two problematic moraic segments occurs as the second mora of the second word, fully general CAL-formation processes would cause them to occur word-finally. To avoid this violation, three patterns of abbreviation are frequently observed in attested forms:

1 – Follow pattern: include in the CAL the mora following /R/ or /Q/ so it is not in final position.

Ex: ‘plastic case’ > **pu.ra**.su.ti.Q.ku **ke.R.su** > **pu.ra.ke.R.su** (5 mora CAL)

2 – Deletion pattern: delete /R/ or /Q/ from the abbreviation.

Ex: ‘potato chips’ > **po.te.R**.to **chi.Q**.pu.su > **po.te.chi** (3 mora CAL)

3 – Replace pattern: remove /R/ or /Q/ and replace it by the following mora of the word.

Ex: ‘american football’ > **a.me.ri.ka.n** **fu.Q**.to.bo.R.ru > **a.me.fu.to** (4 mora CAL)

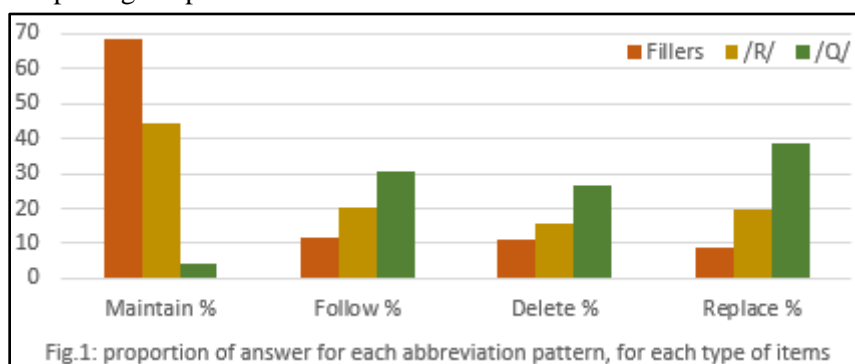
The observed increase in three mora CALs in more recent abbreviations is thus due to the generalization of the deletion pattern for /R/ and /Q/, which is applied in at least 80% of the cases.

In our current study, we asked Japanese speakers to create novel CALs in an experimental setting. Our goal was to assess whether a rule for the treatment of /R/ and /Q/ has been assimilated by Japanese speakers. If so, they would favor the deletion pattern when one of those moraic segments occurs as the second mora of the second word. This experiment is similar to a wug test (Berko, 1958) in that it puts to the test the acquisition of a rule by asking speakers to create novel forms out of a known morphological process. The experiment took the form of a computer game in which participants were

¹ The mora is the relevant rhythmic unit for Japanese (Labrune, 2012).

presented with pairs of loanwords and asked to choose which of four options they considered most natural corresponding to the four observed patterns: follow, delete, replace and the general pattern (maintain). One of two lists of 120 items was presented to each participant. Each list was divided into three groups based on the phonological features of the second word of the pair. “/R/ items” were pairs of words for which the second mora of the second word was /R/; for “/Q/ items” that same mora was /Q/; and for “filler items”, this mora was any other fully licit mora in this position.² We recruited 125 participants through a Japanese crowdsourcing website (lancers.jp). Fig.1 below displays the overall proportion of answers for each abbreviation pattern for those three item types (“Maintain” corresponds to the general pattern).

The results show that the general pattern (maintain) was highly preferred for the filler items. For /R/ items, the general pattern, though being the most frequent, was chosen less often than for the fillers. A χ^2 test showed a significant association between the item type (fillers or /R/ items) and the chosen abbreviation pattern ($\chi^2=760.89$; $df=3$; $p<0.001$). For /Q/ items, the occurrence of the general pattern was negligible. Here again, a χ^2 test showed a significant association between the item type (/Q/ items or /R/ items) and the abbreviation pattern variables ($\chi^2= 1525.73$; $df=3$; $p<0.0001$) This suggests that Japanese speakers have assimilated the general principle for the creation of CALs and reflects how it enters in contradiction with the soft constraint on /R/ and hard constraint on /Q/ in word final position. More interestingly, none of the non-general patterns seem to be preferred over the other ones. This is reflected in the fact that standardized residual values obtained in the χ^2 tests were similar across the alternatives to Maintain (see table 1). In other words, whenever participants did not use the general pattern, they chose from among the other plausible options, even though deletion is the pattern that clearly dominates in attested forms. This last observation is particularly interesting in that it underscores a discrepancy between forms used by the community and forms created by individuals. Our hypothesis to explain such a situation is that community level behaviors, particularly morphological convergence, play a crucial role in the emergence and acquisition of new rules, especially in the case of recent morphological processes.



	/R/ it.	/Q/ it.
Maintain	+18.63	-18.63
Follow	-5.74	+5.74
Delete	-6.14	+6.14
Replace	-9.53	+9.53
	Fillers	/R/ it.
Maintain	+12.61	-12.61
Follow	-8.43	+8.43
Delete	-5.36	+5.36
Replace	-11.02	+11.02

Table 1: z values for the χ^2 tests

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² Items were further divided into subgroups with more refined phonological features with potential influence on the abbreviation patterns, such as the vowel height for /R/ items or length of the word for /Q/ items. However, this will not be discussed in this abstract.

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