Mapping patterns vs. surface patterns for semi-productive rules

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Zhang, Lai, and Sailor (to appear in *Proceedings of CLS*), in testing the productivity of Taiwanese tone sandhi, find an interesting difference between participants in Taiwan and those living in the U.S., and speculate that reduced language use attenuates frequency effects (and, in their case, allows a phonetic effect to emerge). Inspired by their findings, this talk revisits two unpublished experiments suggesting that weakened *mapping* frequencies can give way to *surface* frequencies.

Both experiments dealt with the nasal substitution rule of Tagalog, and were conducted over the web, with participants around the world. The first experiment, with Phillip Monk, was a reverse wug test (Berko 1958), asking speakers to "undo" the rule, which is neutralizing. For example, hypothetical *pa-**m**ugnat* could come from the root ***b**ugnat* or the root ***p**ugnat*. Similarly, *n* can derive from *t*, *s*, *d*, and *ŋ* from *k*, *g*, *ʔ*. The rule is semi-productive, with abundant exceptions, but the distribution of these exceptions is patterned (Zuraw 2000): voiceless consonants undergo the rule more than voiced, and "fronter" consonants more than "backer". The experiment tested which type of frequency was a better model for participants' choices. For example, *bugnat* is a-priori much more probable than *pugnat*, because more roots begin with *b* than with *p*. However, *pugnat* is a-posteriori slightly more probable than *bugnat*, because the greater productivity of the rule in *p*-initial stems outweighs the a-priori advantage of *b*. The ratings of participants residing in the Philippines were better modeled by the a-posteriori probability, and those of participants residing abroad by the a-priori, though in their case neither model does very well.

The second experiment was a normal wug test: given a novel stem (such as *pugnat*), subjects chose whether to apply nasal substitution or not. This experiment tested whether participants' choices mirror the lexical pattern described above. Few usable participants resided abroad, so a distinction was instead made between those who reported speaking another Philippine language—use of which might reduce their Tagalog use—and those who did not. Among the stimuli were sonorant-initial stems, which cannot undergo the rule; although for these stimuli both choices presented were legal in isolation, the nasal-substituted form was illegal as a mapping from the stem that was given. Surprisingly, most participants chose the illegal mapping for at least one sonorant, but there was a difference between the two groups: 64% of Tagalog-only participants chose at least one illegal mapping, and 81% of other-language did. Although the differences between groups are less clear here, the Tagalog-only participants who chose no illegal mappings show the closest match to the lexical pattern (for the obstruents). By contrast, the other-language participants seem to be better modeled by the a-priori probability of, for example, a word with the relevant prefix's having *m* (which could come from substituted *p* or substituted *b*) vs. *p*. Again, it seems that participants with a higher rate of language use are more sensitive to the distribution of the semi-productive mapping, instead of surface frequencies. (There may also be idiosyncratic differences in strategy, since 64% of the Tagalog-only participants did choose an illegal mapping at least once.)

I speculate that phonotactic frequencies are more resistant to reduced language use—because they are refreshed often—whereas frequencies in the distribution of a semi-productive mapping are more vulnerable, since they are refreshed only when the crucial construction is used. Moreover, accessing a mapping frequency requires recognizing the paradigm that the word belongs to, which may be more demanding, as Pertsova (2004) found for the Russian genitive plural. This view implies that the more infrequent a semi-productive mapping is, the more likely patterns in its distribution are to disappear or be replaced by a surface pattern.