

Experimental evidence for perceptual hypercorrection in American r-dissimilation

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The cause of phonological dissimilation is much debated; it is often described as an “unnatural” process, as opposed to the articulatorily natural tendency towards assimilation. Ohala 1993 [1] proposes that dissimilation originates from perceptual hypercorrection for assimilation. Certain features, such as rhoticity, affect acoustics across several syllables. This drawn-out realization can cause perceptual masking of similar nearby sounds. For example, in American *surprise* /səpɹaɪz/, listeners may misinterpret the rhoticity of the first vowel as anticipatory assimilation to the later rhotic, and posit the representation /səpɹaɪz/. This has in fact become a common alternate pronunciation.

Although widely cited, Ohala’s proposal has rarely been empirically tested. As Garrett & Johnson 2011:21 [2] note, “there are almost no controlled observations suggesting that listeners hypercorrect in speech perception.” It has proven difficult to produce perceptual dissimilation in laboratory settings [3,4].

Experiment 1: Perception of 1 vs 2 /r/s.

We tested perception of nonce words that mimic the typical environments for /r/-dissimilation in American English. We created 26 pairs of stimuli by splicing naturally produced syllables containing unstressed /r/ to two different continuations: one that contained /r/ and one that did not (as below). We predicted that listeners would be more likely to miss the presence of the first /r/ when spliced to a continuation with another /r/ (Figure 1).

The nonce words were presented to listeners in naturalistic sentences accompanied by a picture. This method of presentation was designed to mimic the experience of acquiring a new word from conversation. Listeners typed the unfamiliar word, spelling it however they heard it. 20 listeners were divided into two groups, where each group heard half of the stimuli with two /r/s and half with one /r/.

As predicted, the target /r/ was omitted from the written response significantly more often when the continuation also contained /r/: 13/260 times in words with 2 /r/s, versus 4/260 times in words with 1 /r/ ($\chi^2 = 4.9$, $p = .027$). Moreover, the patterns of perceptual error largely followed the tendencies of actual American spoken /r/-dissimilation. For example, /r/-deletion was more common if the two /r/s were in adjacent syllables. We interpret this as evidence that Ohala’s perceptual hypercorrection theory is viable, although we acknowledge other possible explanations of the results as well, in particular, the possibility that listeners apply a grammatical dissimilation rule.

Experiment 2: Effect of intervening r-coarticulation.

In a second experiment currently underway, we attempt to distinguish between grammatical and perceptual explanations by testing whether the presence or absence of rhotic coarticulation on syllables intervening between two /r/s affects the rate of dissimilation. In a nonce word like [maɪ'nɪkjələ], we predict that if we splice in a token of [nɪkjəl] that was extracted from a word without rhotics (e.g. from [mə'nɪkjələ]), the absence of rhotic coarticulation on those syllables should make listeners less likely to interpret the first [ɹ] as anticipatory coarticulation with the [ə]. The grammatical approach to dissimilation would predict no effect.

This experiment uses 35 sets of words, each set including 4 conditions. A target /r/ is spliced to continuations with or without another /r/ (trigger and control conditions), with intervening portion with or without /r/-coarticulation, as shown in Figure 2.

We predict that the presence of a second /r/ and the presence of intervening /r/-coarticulation will each decrease recognition of the first /r/. We will present results of this experiment and discuss their implications for or against the perceptual hypercorrection hypothesis.

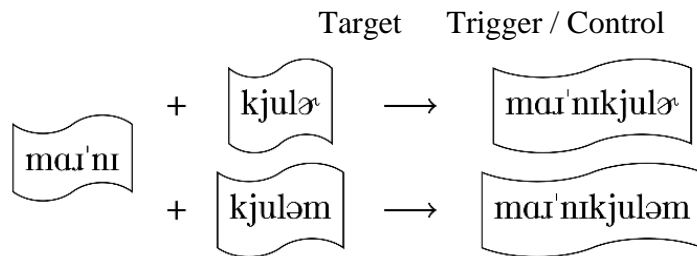


Figure 1

Target	Middle	Trigger / control
maɪ	'ni'kjəl (with r-coarticulation)	ə
		əm
	'ni'kjəl (without r-coarticulation)	əm
		ə

Figure 2

References

- [1] Ohala, J. J. (1993). The phonetics of sound change. *Historical linguistics: Problems and perspectives*, 237-278.
- [2] Garrett, A., & Johnson, K. (2011). Phonetic bias in sound change. In *UC Berkeley Phonology Lab Annual Reports*
- [3] Abrego-Collier, C. (2011). Liquid dissimilation as listener hypocorrection. In *Annual Meeting of the Berkeley Linguistics Society* (Vol. 37, No. 1, pp. 3-17).
- [4] Harrington, J., Kleber, F., & Stevens, M. (2016). The relationship between the (mis)-parsing of coarticulation in perception and sound change: evidence from dissimilation and language acquisition. In *Recent advances in nonlinear speech processing* (pp. 15-34). Springer, Cham.