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Allophonic Emergence: three Ways allophonic rules come to be

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Abstract stuff

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1 Introduction

2 Spontaneous phonologization

1. Spontaneous phonologization is how phonological change happens
   (a) Compare to traditional story (Ohala)
   (b) But lol, even an Ohalan story depends on phonologization to happen spontaneously
   (c) Joe's stuff about what spontaneous phonologization is (can be posited before phonetics)
2. We argue that spont. phon. is the only way that phonological change occurs. It can be probabilistically promoted in two ways:
   (a) Mechanical means (hypo and hyper correction of coarticulation by the listener)
   (b) Community level phonetic change (increase in community variance)

3 Older stuff from when we thought there were three ways of allophonic change

We are now reaching the point in the fields of language change, sociolinguistics, and language acquisition where we can go well beyond Neogrammarian descriptions of sound change, and even beyond the influential work by Kiparsky **[[JCW: get refs**

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]], to ask nuanced questions about how phonological systems emerge. This is to say that we can now treat the "actuation problem" as more than just a problem (**?**): it is a research program, with hypotheses posed at a high level of detail.

Our hypothesis is that there are three distinct possible diachronic paths to allophony, all of which may be currently attested:

1. **Mechanical Means:** The traditionally assumed scenario, Ohala **[[JCW: ref]]** recently elaborated by **?**, and previous work: a low-level phonetic, articulatory, or acoustic/perceptual effect created by a phonotactic context becomes strong enough to be phonologized, reanalyzed at some point by learners as an allophonic rule.
2. **Spontaneous phonologicization:** Speakers spontaneously create an allophone without any phonetic motivation: speakers split one phonological category into two through a pure reanalysis, creating an allophone with no initial phonetic difference from the other allophone. Subsequently, over generational time, the two purely phonological allophones diverge phonetically.
3. **Specialization of a Change in Progress:** A purely phonetic change begins, creating variation in phonetic space, and then different sections of this variation being to specialize for different phonological contexts over time. The phonological change occurs as a reanalysis of the "old" and "new" variants of a phonetic change in progress, after that change is well underway (for independent reasons).

We present evidence below suggesting that all of these scenarios have occurred in the histories of languages, but we do not pretend that this article will settle the question definitively. Rather, we intend the present discussion as a challenge to the fields of historical phonology and sociolinguistics to either confirm or falsify these hypotheses, or to show that some of these scenarios can in fact be reduced to one of the others.

In the first section below, we present some evidence showing that contextual phonetic effects can be reanalyzed as phonological rules. (As there is already a large literature on this topic, we only select a few clear examples.) In section 6, we present new data from an ongoing sound change in New Zealand English illustrating that an allophonic split can occur in the middle of an originally unconditioned sound change in progress. Section 5 reviews and builds on a potentially revolutionary result from **?**, showing that allophonic split can also occur in the absence of any phonetic contextual effects, as a "pure" reanalysis. Finally, section 7 proposes some ways in which the field can test and attempt to falsify the hypotheses presented in this paper.

4 Life Cycle of Phonological Processes

5 Spontaneous phonologization

Both spontaneous phonologicization and specialization of a change in progress involve specialization of phonetic targets for two phonological categories. The difference is just whether the categories precede the emergence of phonetic variation or not.

We build on **?** analysis of his important result by suggesting that the phonetic change which follows the phonological reanalysis can be explained by general principles of language acquisition.

6 Specialization of a change in progress

When a purely phonetic change is in progress (like Philly au fronting), the phonetic variance in the previous generation is larger than it would normally be due to simple production error surrounding a stable phonetic target. More importantly than the variation having a larger variance, the shape of the community's distribution is not symmetrical: it may even be bimodal, or tending towards bimodal. If allophones are learned by finding the center of roughly symmetrical distributions, then there is reason to posit two allophones.

7 Invitation to Falsification

7.1 Predictions

1. Allophonic emergence through mechanical means (articulatory or auditory)
   - The two allophones occur in a one-dimensional space: relative to each other, they are only toward mechanical coarticulation or away from it.
2. Allophonic emergence through spontaneous phonologization
   - Allophones may occur in a two-dimensional space: relative to each other, they may be orthogonal to the direction of mechanical coarticulation. Likewise, they may be orthogonal to the direction of phonetic change.
   - They may be differentiated by phonological processes that are not predictable (e.g. Philly ay-raising could have occurred before velars instead of before voiceless segments)
3. Allophonic emergence through specialization of a change in progress
   - Allophones occur in a one-dimensional space: relative to each other, they are only toward the older variant of phonetic change or toward the new variant.
   - In a case of emergence, this should look like one variant emerging by "reversing" the phonetic change that the variable is undergoing.

8 Conclusions