

Mergers, Distinctions and Shifts

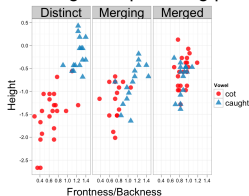
Introduction

Say the words **“cot”** and **“caught.”** Do they sound the same or different?

Historically, these two words have been pronounced differently. Over the past century, a change causing them to be pronounced the same has been steadily progressing throughout North America. This process has been called the “low-back merger.”

Perhaps counterintuitively, mergers between two sounds like this have little measurable impact on communication. However, they are not without consequences. Usually when the merger happens, *cot* begins to be pronounced the way *caught* was. This leaves a phonetic gap in the range of speech sounds utilized in the dialect (1). It also leaves a gap at the symbolic, phonological, level, where a specific combination of abstract features is no longer used to represent any vowel (2,3).

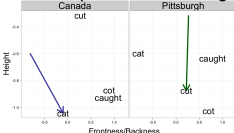
1. Merger and phonetic gap



	front	back	tense
high	kit	foot	
mid	dress	cut	caught
low	cat	cot	

	front	back	tense
high	kit	foot	
mid	dress	cut	caught
low	cat		

4. Consequences of the merger



What happens when these gaps are created? In many dialects, the gap is filled by a neighboring vowel. In some dialects (like Canada), the vowel in **cat** shifts back, sounding more like *cot* used to (4-l). In other dialects (like Pittsburgh), the vowel in **cut** shifts down, again, sounding more like *cot* used to (4-r).

However, it has not been previously explored how widespread these particular consequences are, or where one or the other occurs. It is also unknown which gap (phonetic or phonological) triggers the reaction. Addressing these questions is the goal of this study.

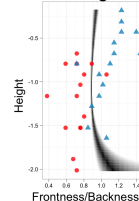
Methodology

I carried out an acoustic, geographic, and statistical analysis of these vowels based on data from the *Atlas of North American English*. The dataset consists of 132,051 measurements from 435 speakers from 256 speech communities.

First, I developed an acoustically based measure for merger. Since the main result of merger is an overlapping of categories, the measure reports degree of overlap in terms of what percent of points are closer to their own category center than to the other (5).

The acoustic correlates of backness and height are well-established. I used the conventional acoustic measure of backness for the degree of *cat*-Backing. To measure *cut*-Lowering I took the distance between *cut* and the lowest short vowel.

5. Calculating overlap



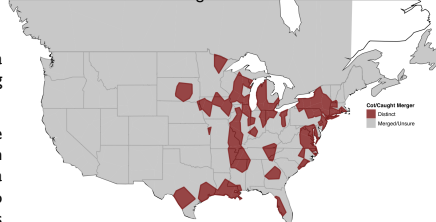
Results

Maps 7 and 9 show that the backing of *cat* is very widespread, even in many areas which maintain the *cot-caught* distinction. Maps 8 and 11 show that *cut*-lowering is more restricted in its distribution, and it does not co-occur with a low-back distinction. Most interestingly, Map 11 shows that *cat*-backing and *cut*-lowering are not mutually exclusive.

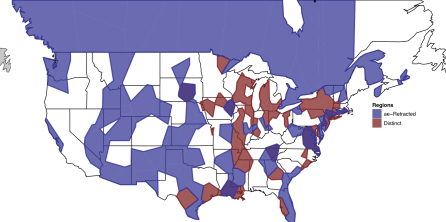
The stats in Tables 12 and 13 report the result of regression and ANOVA analyses. They are meant to distinguish the relative importance of the phonetic gap vs. the phonological gap. The response variables are the phonetic measurements of *cat*-backing and *cut*-lowering, with the (properly centered and residualized) phonetic measurements of *cot*, and the degree of phonological merger (as calculated above) as predictors. For *cat*-backing, the phonetic gap alone is a significant predictor of the shift. For *cut*-lowering, the phonetic gap is a significant predictor, but so is the degree of phonological merger.

Maps

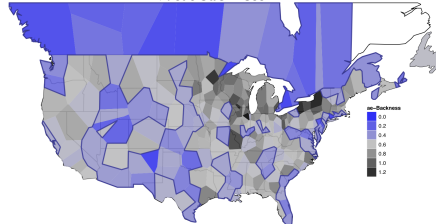
6. Cot/Caught Distinction



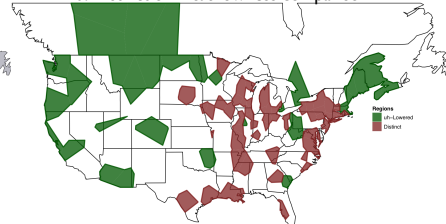
9. Distinction – cat backness comparison



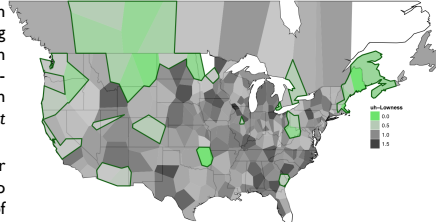
7. cat backness



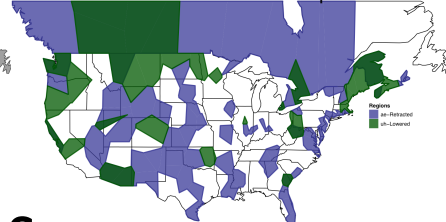
10. Distinction – cut lowness comparison



8. cut lowness



11. cat backness – cut lowness comparison



Stats

12. cat-Backness~	F	df	p
cot-Backness	246.7	1	<0.001 ***
cot-Height	8.8	1	0.003 **
Merger	2.0	3	0.112

13. cut-Lowness~	F	df	p
cot-Backness	76.3	1	<0.001 ***
cot-Height	175.4	1	<0.001 ***
Merger	2.7	3	0.043 *

Conclusion

The previous conclusion of the literature that the low-back merger is the triggering event causing *cat*-backing and *cut*-lowering seems well founded, but the larger pattern is more complex. *Cat*-backing occurs in even in low-back distinction areas, and *cat*-backing and *cut*-lowering can co-occur, even though they are both ostensibly consequences of the creation of a single gap.

The tantalizing analysis drawn from the statistics is that *cat*-backing is a result of the creation of a phonetic gap, whereas *cut*-lowering is a result of the creation of a phonological gap. If this is true, then it is necessary to clarify on which level of representation a specific language change is triggered and progressing.

References

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- Herold, Ruth. 1990. Mechanisms of merger: The Implementation and Distribution of the Low Back Merger in Eastern Pennsylvania. Doctoral Dissertation, University of Pennsylvania.
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