Individual conditioning factors and system knowledge contribute to evaluation of phonological systems

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Recent work in Philadelphia describes a shift in the phonology of the /ae/ system. Some native Philadelphian college students are abandoning the local Philadelphian split system in favor of the more geographically-widespread Nasal system (Labov et al. 2013; Prichard and Tamminga 2012). This shift involves changing the conditioning factors that determine which tokens are tense /aeh/ and which are lax /ae/, as shown in Table 1.

<table>
<thead>
<tr>
<th>Environment</th>
<th>Lexical items</th>
<th>Voiceless fricative</th>
<th>/NG/</th>
<th>Intervocalic nasals</th>
<th>Tautosyllabic /m/ or /n/</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coding in Figure 1</td>
<td>MBG</td>
<td>aEF</td>
<td>aENG</td>
<td>aeNV</td>
<td>aeN#</td>
<td>Other</td>
</tr>
<tr>
<td>Example</td>
<td>mad</td>
<td>class</td>
<td>hang</td>
<td>manage</td>
<td>plan</td>
<td>Cat</td>
</tr>
<tr>
<td>Philly System</td>
<td>TENSE</td>
<td>TENSE</td>
<td>LAX</td>
<td>LAX</td>
<td>TENSE</td>
<td>LAX</td>
</tr>
<tr>
<td>Nasal System</td>
<td>LAX</td>
<td>LAX</td>
<td>TENSE</td>
<td>TENSE</td>
<td>TENSE</td>
<td>LAX</td>
</tr>
</tbody>
</table>

Table 1: Six conditioning factors, their corresponding labels in Figure 1, and their status under both systems

Although the change from the Philadelphia system to the Nasal system is a shift from a local system to a supra-regional standard, there is little work done on whether the Philadelphia system is evaluated differently from the Nasal system. In this paper, I investigate the following two questions:

1. Is there a difference in the subjective evaluations of the Nasal system and the Philadelphia system by the community?
2. If so, is this difference caused by the negative evaluation of certain phonological environments or is it caused by the negative evaluation of a system as a whole?

I used a modified magnitude estimation perception experiment to measure system evaluations from 57 native speakers of English who were born and raised in Philadelphia. Magnitude estimation has been shown to be a useful way to obtain acceptability ratings on syntactic forms (Sprouse 2008). For this study, participants were played a reference word (“chocolate”), which was assigned a score of 100. They were then presented with individual auditory stimuli and asked to rate the stimuli for how “well pronounced” they sounded relative to the reference word. Each participant was played an equal number of lax and tense words from each conditioning environment, for a total of 48 target words. An additional 47 tokens, which did not contain an /ae/ token, were used as control (filler) words.

Responses were z-scored by participant. Figure 1 depicts boxplots of participants’ responses to lax (red) and tense (blue) tokens, separated into the six possible conditioning environments. The plot is split into tokens that follow the Nasal system (left), Philadelphia system (right), and neither (middle).
I find two overall patterns. First, participants rate tense tokens low except for the tense tokens that follow the Nasal system ($p=.006$). Second, participants rate lax tokens high except for the lax tokens that do not follow either system ($p=.02$). I argue that while participants seem to show a preference for the phonetic quality of lax tokens over tense tokens, this preference is also mitigated by their knowledge of the two systems. While participants prefer lax tokens overall, they also prefer tense Nasal tokens to tense Philly tokens, and tense Nasal tokens to lax no-system tokens.

These findings show that Philadelphians do rate the Nasal system higher than the Philadelphia system, but that their ratings are also sensitive to individual conditioning factors within the system and are not just a reaction to the system as a whole. As a dialect-specific finding, this suggests that the tense environments of the Philadelphia /ae/ system is stigmatized by the community. More generally, these findings show that speakers use both systemic knowledge and individual conditions in evaluating phonological systems.

References

