

Perceptions of phonological phenomena in Southern Alberta and Saskatchewan English

Bryce Jacob Wittrock

Lund University SOL Centre for Languages and Literature

wittrock@ualberta.ca

Abstract

This investigation explores perceptions of two particular phenomena in Southern Alberta and Saskatchewan English (SASE) and how judgements of these vary between two other English variants. What appears to be Canadian Raising (CR) before voiced segments and an optional alternation of /ɑ/ → [ʌ] before [ɪ] are explored. A task was designed to measure “perceptual constancy,” that is to say the extent to which perception of phonological categories remains consistent across neutral or change-triggering environments (Beddor, P. S., et al., 2007). The perception task highlights differences among the two participant listener groups and also offers insight into the nature of vowel qualities of the stimuli speaker group. Participants from Ontario and the UK judged the vowel qualities of CR diphthongs before voiced and voiceless segments as well as qualities of [ɑ] or [ʌ] before [ɪ] and elsewhere as articulated by SASE speakers. This project sheds light on phonetic differences between all three groups with regards to the two targeted phenomena. Results suggest that CR is realized differently in SASE and Ontario English, UK English speakers (predictably) do not discriminate between raised and unraised minimal pairs, and that SASE’s pre-[ɪ] allophone of /ɑ/ is perceived roughly equivalent to /ʌ/.

Background and research goals

CR describes the transformations of /aɪ/ into [ʌɪ] and /aʊ/ into [ʌʊ] before voiceless consonants among some English di-

alects, including most variants in Canada (Chambers, 1973). In contrast to this description, many SASE speakers do not observe the change of /aʊ/ → [ʌʊ]/__C[-voice] and many transform /aɪ/ into [ʌɪ] preceding voiced segments (Wittrock & Tucker, 2019). For example, ‘spy’ is often pronounced predictably as [spaɪ] but ‘spider’ not uncommonly as [spraɪdɪ] or [spraɪrɪ]. This data inspires the first research question of this investigation:

1. How might different varieties of English perceive expected and unexpected realizations of CR in SASE?

Also within the corpus gathered in Wittrock & Tucker there is what appears to be an optional vowel alternation of /ɑ/ → [ʌ] before [ɪ]. Words such as ‘guitar’ and ‘cigar’ may be pronounced as either [gɪtɑɪ] or [gɪtʌɪ] and [sɪgɑɪ] or [sɪgʌɪ] respectively. As phonemes, /ɑ/ and /ʌ/ were also pinned close to one another in the SASE vowel space. This data inspires this investigation’s second research question:

2. How do other English varieties perceive SASE [ɑ] and [ʌ] before and independent of [ɪ]?

This is to say: to what extent is this allophonic realization passable as a phonemic /ʌ/ in other English varieties?

Material and methods

Participants

Two participant pools were recruited through word-of-mouth and personal relationships. Three women in their late teens to early twenties from Orangeville, Ottawa, and Toronto, ON, Canada make up the Ontario English group. Five men

in their early twenties from Blackpool, London, Seaford, and Welwyn Garden City, UK make up the UK English group. Participants were asked to provide their age, gender, first language(s), other languages spoken, any issues with their speech and/or hearing, and the town/city they consider themselves to have grown up in. If participants felt that multiple places were significant, they were instructed to include them all and specify an approximate age range for each location. This information was collected to ensure that all participants were healthy native speakers who are more or less representative of the areas they come from.

Presentation of the task

A perception task was created in the form of a PowerPoint file and sent to participants individually via email. Respondents were first presented a slide on which they were to fill in their metadata information described in the previous section. Participants were then presented a slide informing them that they were invited to participate as non-compensated volunteers in a study investigating “how different speakers perceive the language they hear.” Participants were informed that no personally identifying information would be asked of them and their responses and metadata are used for research purposes only. Consent was given by replacing an underscore following this information with an X and further given by submitting the file edited to contain their responses. Participants were free to withdraw at any time and dispose of the file sent to them.

Design of stimuli

The stimuli consist of twenty one audio files plucked from the Wittrock & Tucker SASE corpus. Stimuli were drawn from either a careful speech context (word list reading) or an interview context wherein the pronunciation of the target word was sufficiently long and clear. The recordings were edited so that

participants would hear only the onset and nucleus of each item. The editing was done to eliminate the triggering environment for any possible change in vowel quality. Participants made their judgements on vowel quality by selecting what they believed the unedited word should be. There are two types of stimuli corresponding with the two research questions of this investigation: CR questions and [ɑ] or [ʌ] questions. When judging a CR item, participants had the following options:

- a word with [aɪ] before a voiced consonant
- a word with [ʌɪ] before a voiceless consonant
- I hear both words equally
- It cannot be either word

For these stimuli, either a voiced or voiceless consonant coda was removed to isolate the influenced vowel. In a similar fashion, [ɑ] or [ʌ] questions had the following response options:

- a word with /ɑ/
- a word with /ʌ/
- I hear both words equally
- It cannot be either word

For these stimuli, either a coda of [ɪ] or an elsewhere environment was removed. The two word options were minimal pairs differing only in vowel quality and in the case of CR questions, voicing of the following consonant. In this style, neither of the word options need to be the true unedited word from the corpus. In the example of ‘wire’ pronounced as [waɪəɪ] participants were given the options of ‘wide’ (denoting [aɪ]) and ‘white’ (denoting [ʌɪ]). In the case of [ɑ] or [ʌ] questions before [ɪ], providing minimal pair options including the actual word is not even possible as there is no phonemic distinction between [aɪ] and [ʌɪ].

Beyond CR questions and [ɑ] or [ʌ] questions, each stimulus falls into one of seven categories:

1. [ɑ] before [ɪ]
2. /ɑ/ elsewhere
3. [ʌ] before [ɪ]
4. /ʌ/ elsewhere
5. /ʌɪ/ before C[-voice] (expected CR)
6. [ʌɪ] before C[+voice] (unexpected CR)
7. /aɪ/ before C[+voice]

Note that while there is an eighth logical category stimuli could fall into, /aɪ/ before C[-voice], this category does not exist since all instances of /aɪ/ in this environment are raised to [ʌɪ] in the SASE corpus. Three representative tokens for each category were shuffled and presented in the PowerPoint file. No fillers were necessary as participants were blind to the independent variables and any recognition of a pattern could not influence the perception of it.

Results

In Tables 1 and 2 participant responses are tallied and expressed as percentages for each option sorted by stimulus category. No statistical model is used outside of comparing raw percentages because the small sample sizes cannot garner generalizations that are sufficiently statistically significant. The scope of this project lends itself more to a glimpse of what may be significant if executed on a larger scale.

Discussion

Interpretation of this data operates under the general assumption that the closer a given SASE vowel is in quality to the corresponding vowel in a speaker's dialect, the higher the degree of accuracy the speaker will have classifying it. Under this assumption we gain insight into differences between participant groups in cases where one is more accurate in sorting SASE vowels than the other. Moreover, in cases where neither participant group agrees on categorizing an SASE vowel as something mirrored in

their own speech we may conclude either that this is a way SASE may be dissimilar to both groups or that the stimuli itself is inadequate and unrecognizable.

One such example is the first category where neither group is cohesively confident in identifying [ɑ] before [ɪ] as [ɑ]. When contrasted with the overwhelming agreement between both groups on classifying /ɑ/ in other environments as [ɑ], we may infer that there is something going on qualitatively with SASE [ɑ] before [ɪ] that differentiates it in this environment even among the most /ɑ/-like tokens available in the corpus. However, this is not to rule out some acoustic differences between SASE elsewhere /ɑ/ and that of Ontario or UK English since some instances of this were perceived as equal to [ʌ] or something else entirely despite majority agreement. Regarding [ʌ] before [ɪ], Ontario English speakers perceive this realization roughly as often as in the elsewhere environment and with a high degree of consistency whereas there is something about the [ɪ] context that mildly lowers UK accuracy.

As a group, the CR categories' results are perhaps less straightforward. What was supposed to be a control for the fellow Canadian English speakers, perceiving /ʌɪ/ in a voiceless context as [ʌɪ], was not easily recognized and even rejected almost a third of the time. This suggests that SASE speakers and Ontario English speakers transform /aɪ/ in acoustically different ways or to different extents. Given this result and the independent nature of the /aɪ/ and /aʊ/ alternations (Chambers, 1989), it may be inauthentic to label one or both of these groups' transformations as "Canadian Raising" at all.

The UK English group, who of course have no CR distinction in their dialects, were predictably less confident in classifying the diphthong, with outright rejection being the most common response. Among those UK respondents

Table 1. Ontario English responses to each stimulus category

1: [ɑ] before [ɹ] as [ɑ]	[ɑ] 33%	Equal 33%	[ʌ] 22%	Neither 11%
2: /ɑ/ elsewhere as [ɑ]	[ɑ] 77%	Equal 11%	Neither 11%	
3: [ʌ] before [ɹ] as [ʌ]	[ʌ] 88%	Neither 11%		
4: /ʌ/ elsewhere as [ʌ]	[ʌ] 77%	Equal 11%	Neither 11%	
5: /ʌɪ/ before [-voice] as [ʌɪ]	[ʌɪ] 44%	Neither 33%	Equal 22%	
6: [ʌɪ] before [+voice] as [ʌɪ]	[ʌɪ] 55%	Equal 44%		
7: /aɪ/ before [+voice] as [aɪ]	[aɪ] 44%	Equal 33%	[ʌɪ] 22%	

Table 2. UK English responses to each category

1: [ɑ] before [ɹ] as [ɑ] ¹	[ɑ] 46%	Neither 20%	[ʌ] 20%	Equal 6%
2: /ɑ/ elsewhere as [ɑ]	[ɑ] 73%	Neither 26%		
3: [ʌ] before [ɹ] as [ʌ]	[ʌ] 60%	Neither 26%	Equal 26%	
4: /ʌ/ elsewhere as [ʌ]	[ʌ] 86%	[ɑ] 6%	Equal 6%	
5: /ʌɪ/ before [-voice] as [ʌɪ]	Neither 40%	[ʌɪ] 26%	Equal 20%	[aɪ] 13%
6: [ʌɪ] before [+voice] as [ʌɪ]	[ʌɪ] 60%	Equal 20%	Neither 20%	
7: /aɪ/ before [+voice] as [aɪ]	[aɪ] 46%	Neither 26%	Equal 13%	[ʌɪ] 13%

¹ One respondent left an item blank, hence a missing 6%.

who do not reject the raised form, it is perceived either as the unraised [aɪ] or recognized as equivalent to it half the time, leaving the other half being accurate classifications as [ʌɪ]. This result could be interpreted as guessing and would corroborate a predictable lack of distinction for raised/unraised forms in UK English.

Perceptions of the form unexpectedly raised before a voiced segment as [ʌɪ] were actually more common than perceptions of the CR controls as [ʌɪ] by the Ontario English speakers. This category of unexpected CR was judged as [ʌɪ] or equally [ʌɪ] and [aɪ] but never only [aɪ] or rejected. This result of SASE [ʌɪ] before C[+voice] being more palatable than before C[-voice] for the Ontario English group buttresses the hypothesis that these groups' realizations of CR are not acoustically identical. Further, the UK English group was more successful in identifying [ʌɪ] in the voiced environment than in the voiceless one. Perhaps the SASE raising to [ʌɪ] in voiceless contexts is to a great enough extent that it is no longer reconstructable

as an [aɪ]-like diphthong to UK English speaker ears.

In a similar situation as the CR control stimuli, /aɪ/ was perceived as [aɪ] before a voiced consonant a surprisingly low amount – slightly less than half the time in both groups. Ontario English speakers even classified the SASE articulation as [ʌɪ] 22% of the time. For the group that has a CR distinction to categorize what were intended to be unraised controls as raised variants suggests that perhaps all SASE /aɪ/ diphthongs are generally higher than those of Ontario English.

Conclusion

While the scope of this project is admittedly small, we are able to glean some insight into its two research questions and narrow the questions of future research. With regards to the first question, we are able to see some general perceptual differences between Ontario and UK English when evaluating SASE pronunciation of CR. Predictably, the UK group did not reliably sort raised and unraised forms in either voiced or voiceless environments. The Ontario English

group surprised in this area by not judging SASE realizations as matching their own perceptions of CR. Future investigations ought to acoustically analyse and compare CR as articulated by Ontario English speakers and both expected and unexpected instances of raising by SASE speakers.

For the second research question, our answer is again partial. There is evidence that the SASE phoneme /ʌ/ and pre-[ɹ] allophone of [ɑ] are perceived as equals. Future research ought to acoustically examine these two realizations. Further investigation into the relationship between [ɑ] and [ʌ] should address questions about a potential merger, SASE perception of these vowels, and the conditions under which the apparent alternation occurs.

Acknowledgements

Enormous thank you to Mechtild Tronnier for her mentorship in this project

over the course of FONM11: Experimental Phonetics, for which this work was originally prepared. Thank you to Lund University as a whole for the warm hospitality on my academic exchange from the University of Alberta, Edmonton, Canada.

References

- Beddor, P. S., et al. (2007). Applying perceptual methods to the study of phonetic variation and sound change. In Sole, M., et al (Eds.), *Experimental approaches to phonology* (pp. 127-143). Oxford: Oxford University Press.
- Chambers, J. K. (1973). Canadian raising. *Canadian Journal of Linguistics/Revue canadienne de linguistique*, 18(2), 113-135.
- Chambers, J. K. (1989). Canadian raising: blocking, fronting, etc. *American Speech*, 64(1), 75-88.
- Witrock, B. J., Tucker, B. V. (2019) *Canadian prairie dialects: An exploration of Alberta and Saskatchewan vowels*. Manuscript in preparation.