

Joining the Western Region: Sociophonetic Shift in Victoria

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Abstract

The literature on Canadian English provides evidence of distinct dialect regions. Within this landscape, the province of British Columbia is set apart as a sub-region in the west, yet information concerning “local” English is notably skewed toward a single urban setting, Vancouver. To assess and extend the generalizability of prior observations, this paper targets the city of Victoria and situates the results from a large-scale sociolinguistic investigation within the model of the typical (western) Canadian city presented in Boberg (2008, 2010). We consider vocalic features characterized as either General Canadian or distinctively Western Canadian. We also consider “yod” (i.e., the presence of an onglide in *student*, *tune*, and the like), a conservative feature that is obsolescing across the nation. Our results support Boberg’s (2008, 2010) observations while positioning Victoria as both innovative—participating in national changes—and conservative—joining certain changes relatively recently and retaining older dialect features. Such results enable us to trace leveling to national and more local dialect patterns, while also reminding us of sociohistorical forces in the formation of dialects.

Keywords

Canadian English, leveling, Canadian Shift, back vowel fronting, GOOSE, low back merger, yod

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I. Introduction

The publication of the *Atlas of North American English* (ANAE; Labov, Ash & Boberg 2006) was a milestone achievement in North American English dialectology, providing a comprehensive overview of white urban vowel patterns and systems in the US and Canada. To this considerable body of evidence, the Phonetics of Canadian English project (PCE; Boberg 2008, 2010) added critical internal geographic detail for Canadian dialect regions. Importantly, where a primary concern of Labov, Ash, and Boberg (2006) with respect to Canada was to situate it within the taxonomy of North American English dialects (Boberg 2008:130), the explicit aim of the PCE was to provide a more elaborated picture of internal variation. As a result, the PCE has laid the groundwork for finer grained regional analyses, raising at least three topics for further exploration.

First, within the broader background of the PCE, areas that were aggregated within larger urban complexes as well as those with histories of isolation (social, geographic) remain relatively unexplored. By broadening the empirical database, sites such as these hold the potential to expand the sociolinguistic and regional validity of Boberg's (2008, 2010) observations. They can also reveal pathways of change as dialects begin to participate in supralocal patterns of variation, simultaneously shedding light on conservative and innovative features within a variety.

Second, as second-generation members of their native speech communities, the PCE participants were ideal representatives of local dialects, but the sample was limited to undergraduate students. This restricts the generalizability to some extent, in terms of synchronic, generational patterns of change and social effects on variation.

Third, a number of phonetic features of Canadian English overlap with similar features in the US (see Labov, Ash & Boberg 2006 for discussion). For example, a pattern resembling the Canadian Shift (lowering and retraction of KIT, DRESS, TRAP) has been observed, alongside merger of the low back vowels (LOT, THOUGHT, PALM), in areas of the Midland and Western United States (e.g., Bigham 2010; Durian 2012; Kennedy & Grama 2012).¹ This makes the broader cross-national profile relevant to local descriptions. Political borders are sometimes linguistic boundaries also (e.g., the Northern Cities Shift has not crossed into southern Ontario; see Boberg 2000; Labov, Ash & Boberg 2006), but sometimes they are not (e.g., the diffusion of Foreign (a), TRAP > LOT, into Canadian English from American English; see Boberg 2000, 2009).²

In this study we tackle these evidential points, problematizing space (within a region—British Columbia, and across regions—Canada, the US), diachrony (across apparent time), and social categories (across gender).³ We replicate the analytical methods of the PCE (Boberg 2008, 2010) and present a detailed analysis of five features (and thirteen lexical sets) of English in Victoria, a formerly isolated urban center in southern coastal British Columbia (BC). Our participants range in age from fourteen to ninety-eight years and represent diverse backgrounds. Our results thus fill a descriptive gap in the linguistic geography of North American Englishes, adding momentum to the growing movement toward what Eckert (2016:viii)

describes as “a detailed Western dialectology.” The sample design enables an analysis of change over time, revealing the ways in which a previously peripheral region becomes aligned (or not) with supraregional changes affecting the broader national variety. This has implications for comparative sociophonetics and regional dialectology, and serves as a reminder of the impacts of sociohistorical factors on the formation of dialects.

2. Victoria as a Sociolinguistic Entity

Victoria is located on a peninsula at the southern tip of Vancouver Island, separated from continental Canada by the Salish Sea. Settler colonialism began in the region with the establishment of a Hudson’s Bay Company trading post in 1843. Incorporation as a city followed in 1862, and when BC joined the Canadian Confederation in 1871, Victoria was named the provincial capital (e.g., Gregson 1970). Importantly, however, no overland routes connect Victoria (or any part of the island) to the mainland. As a result, Victoria was relatively isolated throughout much of its history. Transportation links (land, sea, air) are now regular and plentiful, but for more than a century land travel to elsewhere on the island required an arduous journey through a mountainous pass, and boat service was limited, particularly in the winter. The city was briefly a busy seaport during the BC gold rush (late 1800s), but it quickly lost ground to Vancouver, the terminus of the Canadian Pacific Railway, when the rush waned. Regular, year-round ferry service between the peninsula and the Canadian mainland was only established in 1960, the same period when affordable air travel became available.

The settler population was established by westward migration from southern Ontario; throughout the city’s history these Canadian migrants have consistently been the majority demographic input. At the same time, Victoria has always had a British substrate. From the mid-nineteenth to mid-twentieth centuries, just over 20 percent of in-migration came from England (D’Arcy 2015:49). It is therefore an important part of the city’s history that, integrated within the realities of colonial life, Victoria’s founders intended to establish a settlement to which “British subjects could safely migrate” and “[establish] their children’s inalienable heritage and an eternal link of sentiment with the Motherland” (Kluckner 1986:11; see also Reksten 1986). The primary means for ensuring this cultural continuity was education, paramount in the transfer of upper-middle-class English norms. Until the end of the Second World War, many teachers and virtually all private school headmistresses were recruited directly from England, as were models of governance, curricula, and pedagogical materials (Barman 1984; Trueman 2009).

Today the most enduring hallmarks of the English are primarily architectural and toponymic.⁴ The historically English-settled part of town, which remains affluent and independent despite its changing demographics, is known as the Tweed Curtain. It was where the private-school educated upper class was born and raised, and an English-like accent, known locally as “the Van Isle accent,” persevered among the city’s social elite. Features of this social accent include variable rhoticity in post-vocalic contexts,

variable application of the TRAP-BATH split, and retention of intervocalic [t].⁵ Speakers with this accent are all elderly now—the opening up of the island, the shift away from English teachers and school administrators, alongside other factors, has impacted its sustainability. What is important for our purposes is that these “English” children represented only a small proportion of Victoria’s young. The majority of the population has always lived in front of the Tweed Curtain, not behind it.

Nonetheless, the English substrate and the historically restricted level of contact raise the possibility that Victoria may not align fully with other urban centers that have provided the primary input to descriptions of Canadian English. This seems particularly pertinent at a time when the sociophonetics of English in BC are emerging as an area of interest (e.g., Sadlier-Brown & Tamminga 2008; Pappas & Jeffrey 2013; Swan 2016). In both historical and contemporary terms, research on BC has generally relied on evidence from Vancouver, the largest metropolitan area in the province and the third largest in the country (at roughly 2.5 million). Vancouver also belongs to the “super-diversity” category, characterized by population diversification through linguistic, ethnic, and country-of-origin channels (see Vertovec 2007). Victoria, by contrast, is much smaller (metropolitan population 350,000) and much less diverse (D’Arcy 2015:47-48).

Vancouver has either been the specific focus (e.g., Gregg 1957, 1992; Chambers & Hardwick 1986; de Wolf 1988, 1993; Esling 1991; Esling & Warkentyne 1993; Sadlier-Brown & Tamminga 2008) or the primary focus (Hung, Davison & Chambers 1993; Labov, Ash & Boberg 2006; Boberg 2008) of most previous work on English in the region. The rest of BC has figured much less prominently in descriptions of Canadian English. The PCE, for example, included a few speakers from the interior of the province but none from the island (Boberg, personal communication, November 3, 2016). Studies that include Victoria comprise impressionistic analyses of Canadian Raising and Fronting (Hung, Davison & Chambers 1993) and instrumental studies on Canadian Raising and the Canadian Shift (Rosenfelder 2007; Hoffman 2010; Pappas & Jeffrey 2013). Despite these exceptions, the picture of English in BC is notably skewed toward a single urban variety and is limited with respect to social and demographic breadth.

It goes without saying that any region is greater than a single city, and yet models of linguistic diffusion direct us to large conurbations as central vectors of variation and change (Trudgill 1974; Bailey et al. 1993; Labov 2003). In this case, there is reason to expand beyond such concentrated evidence. Within the linguistic ecology of English in BC, what do other locations and socio-cultural settings contribute to the overall picture?

Relying on Boberg (2008, 2010) as points of reference, this study seeks to position Victoria within the Western Canadian dialect region, thereby adding generalizability to previous results. In doing so, we examine change over time, effectively tracing the shift from isolation to integration within a social and geographic milieu. This allows us to ask not only how Victoria fits in but also how it came to fit in. In other words, we can begin to probe questions of leveling as features are shared across vast geographic expanses of the Canadian landscape.

Table 1. The SCVE Sub-Sample

| Year of birth | Age at time of recording | Female | Male | Total N |
|---------------|--------------------------|--------|------|---------|
| 1994-1998 | 14-18 | 4 | 4 | 8 |
| 1979-1993 | 19-33 | 13 | 13 | 26 |
| 1958-1978 | 34-54 | 14 | 12 | 26 |
| 1942-1957 | 55-70 | 12 | 14 | 26 |
| 1913-1941 | 71-98 | 16 | 12 | 28 |
| Total N | | 59 | 55 | 114 |

3. Data and Methods

To explore these questions, we draw on the Synchronic Corpus of Victoria English (SCVE), part of the Victoria English Archive (for details, see D’Arcy 2017). The full archive contains both contemporary and archival materials, representing over 300 hours of dialogue from 220 speakers of primarily British descent. The synchronic portion, the SCVE, consists of sociolinguistic interviews with 162 locals, collected by a team of field workers in 2011-2012. The speakers are first to sixth-generation Victorians—many of whom represent different generations of the same family—from a range of occupational and educational backgrounds. Their years of birth span 1913 to 1998, for an age range of fourteen to ninety-eight years at the time of recording. From the full synchronic corpus, a 114-speaker sub-sample was selected for analysis with the aim of balancing speaker sex and age as much as possible within and across cells; see Table 1. Selection was randomized. The eighty-five-year age range is an integral component of our analysis: it expands the window beyond university students and brings a continuous apparent time component to the question of dialect differentiation (or homogenization) in the Canadian context (cf., Boberg 2008, 2010).

The PCE analysis is based on word-list data. The full list is available in Boberg (2008:153), which the SCVE replicated (the word *witch*, not discussed here, was added to target the merger of /w/ and /ʍ/ [*witch*, *which*]).⁶ In Table 2 we present the part of the list, broken down by lexical set and, in some cases, phonological context, that is relevant to the analyses we present. While we acknowledge that word-lists are often used to elicit a more formal style in sociolinguistic interview contexts, replicating the PCE list has two main advantages. First, the list was custom-designed for Canadian English, with the target vowel consistently in primary stress position and phonological environments controlled for adjacent phonemes. Second, it provides an identical lexical set for comparative analysis with Boberg’s (2008) large-scale results.

Table 2. Target Words and Contexts from the SCVE (based on Boberg 2008)

| | Lexical set | Context | Target | Total N |
|----|-------------|----------------------------------|--|---------|
| 1 | FLEECE | | seat, seed, seen, veto, see | 537 |
| 2 | KIT | | did, kiss, sit, sick, tin, tip | 623 |
| 3 | FACE | | stain, state, stayed, say | 429 |
| 4 | DRESS | | dead, deck, set, step, ten, test | 630 |
| 5 | TRAP | | bad, cast, sad, sat, tap | 488 |
| 6 | BAN | pre-nasal (non pre-velar) | band, ham, stamp, tan | 388 |
| 7 | BAG | pre-voiced-velar | bag, bang, gag, hanger, tag | 460 |
| 8 | STRUT | | bus, cup, cut, duck, stud, sun | 608 |
| 9 | LOT | | bother, cot, Don, monitor, sock, sod, top | 701 |
| 10 | THOUGHT | | caught, dawn, saw, sawed, talk, toss | 631 |
| 11 | PALM | | calm, father, lager, palm, spa | 480 |
| 12 | GOAT | | boat, coat, code, go, stone, toe | 634 |
| 13 | | pre-lateral | bold, cold, stole | 300 |
| 14 | FOOT | | cook, foot, stood | 325 |
| 15 | GOOSE | | | |
| 16 | BOOT | post-labial, non-pre-lateral | boot, food | |
| 17 | TOO | post-coronal, non- yod | do, soon, too, tooth | 431 |
| 18 | NEW | post-coronal, historical yod | due, new, student, tube | 419 |
| 19 | FOOL | non-post-coronal, pre-lateral | cool, fool | 189 |
| 20 | START | | bar, car, dark, harp, star, start | 600 |
| | Total N | | | 9082 |

3.1. Analytical Foci: The Features

To capture the characteristics of Victoria speech while also situating the variety in a larger dialect geography, we focus on phonetic variables that document regional or supraregional patterns (Labov, Ash & Boberg 2006; Boberg 2008, 2010). Two features, the Canadian Shift and back vowel fronting, are described in ANAE as widespread in North America (see below); Boberg (2008, 2010) identifies them as General Canadian. These features enable assessment of mainstream influence and of leveling to broader, national patterns. To assess regional characteristics, we investigate *START* vowel retraction and the proximity of pre-nasal and pre-voiced-velar *TRAP* (i.e., *BAN*, *BAG*), features identified by Boberg (2008) as distinctively Western Canadian.⁷ Finally, to explore the possibility of dialect differentiation, we move beyond the features isolated in ANAE and the PCE and consider “yod” (i.e., the presence of an onglide in *student*, *tune*, and the like), a conservative feature argued to be obsolescing in North American varieties of English.

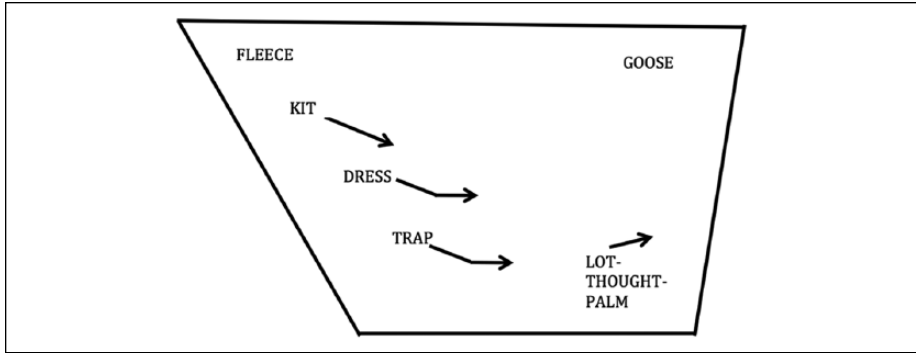


Figure 1. The Canadian Shift (adapted from Roeder & Gardner 2013)

3.1.1. The Canadian Shift. Research on North American Englishes has revealed a common pattern of systemic change in a subset of the vowel inventory—the KIT, DRESS, and TRAP vowels (rows 2, 4, and 5 of Table 2). Generally speaking, these lexical sets are exhibiting lowering and/or retraction in the Western and Midland regions of the US (e.g., Bigam 2010; Durian 2012; Kennedy & Grama 2012; but see Drager et al. 2013 for a different pattern in Hawai'i) and across Canada (e.g., Esling & Warkentyne 1993; Boberg 2005a, 2008, 2010; Hagiwara 2006; Sadlier-Brown & Tamminga 2008; Hoffman 2010; Roeder & Jarmasz 2010; Pappas & Jeffrey 2013; Kettig & Winter 2017). Although the phonetic details are somewhat different and shifts involving the lax front vowels in North American varieties are sometimes referred to by different names (e.g., the California Shift), we consider them to be governed by the same underlying phonology.

Regardless of locale, KIT and DRESS each pattern as unified lexical sets in Canadian English. That is, neither is subject to allophonic splits. TRAP, on the other hand, is subject to multiple sub-patterns. As shown in Table 2 (rows 5-7), we consider three of them here (see Labov, Ash & Boberg 2006): before a labial or coronal, before a non-velar nasal, and before a voiced velar. It is the pre-labial and pre-coronal contexts that participate in the Canadian Shift; these are the environments we refer to when we discuss TRAP. The other two contexts relate to a separate phenomenon, raising of BAN and BAG, discussed below.

Clarke, Elms, and Youssef (1995) first documented the Canadian Shift, which they proposed was triggered by the merger of the low back vowels (PALM, LOT, THOUGHT); this merged set also underwent further retraction (see Figure 1). That these features are linked remains a robust hypothesis, in that many regions with retraction/lowering of the lax front vowels are characterized by the low back merger (Labov, Ash & Boberg 2006). In addition to tracking the Canadian Shift in the SCVE materials then, we also explore the behavior of the low back vowels.

3.1.2. Raising of BAN and BAG. The raising patterns of BAN and BAG are diagnostic of regional dialect areas in North America.⁸ BAN commonly raises across varieties,

varying by degree of shift along F1. BAG raising is attested across the north-central and northwestern US (e.g., Zeller 1997; Bauer & Parker 2008; Wassink 2015), as well as from Ontario to Vancouver in Canada (e.g., Boberg 2008, 2010). The Prairies and BC are set apart, however, in that among young people, BAN and BAG exhibit equivalent degrees of raising (Boberg 2010:207). The more typical pattern is the “continuous” short-a pattern, in which the vowel raises more before nasals than before velars (Labov, Ash & Boberg 2006; Boberg 2010).

3.1.3. Back Vowel Fronting. Back vowel fronting is cross-linguistically common (Labov, Ash & Boberg 2006:155). In North American Englishes, fronting of GOOSE is well attested and is often accompanied by fronting of GOAT (e.g., Labov, Ash & Boberg 2006; Boberg 2010:230). FOOT is sometimes implicated as well (e.g., Ward 2003). Boberg (2008:141) found no significant variation between regions in Canada for the F2 of either GOOSE or GOAT, but he noted that Vancouver speakers were among the most innovative in the PCE (see also Labov, Ash & Boberg 2006:143-145, 150-157). Boberg (2010:209) subsequently reported a split in Western Canada, with GOOSE and GOAT more fronted in BC than in the Prairies. In short, Vancouver has highly innovative realizations of both GOOSE and GOAT. In varieties with back vowel fronting, GOOSE and GOAT tend to be more advanced following coronal onsets (probably for assimilatory reasons), while tokens before /l/ tend to be more conservative. For example, Boberg (2008:137) found GOAT to be higher and backer in pre-lateral contexts than elsewhere. We thus follow him in differentiating between these two environments (cf., Table 2, rows 12-13).

As outlined in Table 2 (rows 15-19), GOOSE was separated into four sets that reflect phonologically conditioned variation: post-labial and non-pre-lateral (BOOT), pre-lateral (FOOL), and two post-coronal categories, one with yod historically (NEW) and one without (TOO). These sets are motivated by phonetic factors, though the degree of TOO fronting varies regionally (Labov 2010:263).⁹

3.1.4. START Retraction. Boberg (2008, 2010) reported the F2 of START to be one of the most regionally distinct features of Canadian English. It is also stable (Boberg 2008:149). In Ontario, the Maritimes, and Newfoundland and Labrador, Quebec and the Western region, START is significantly more retracted.

3.1.5. Yod. Variable realization of the on-glide, “yod,” is a well-attested feature of Canadian English (e.g., Avis 1956; Pringle 1985; Gregg 1992, 2004; Clarke 1993, 2006). It occurs in post-coronal position in a historically related subset of GOOSE in which an initial coronal is followed by yod (NEW), as in *new* [nju]. This set contrasts with TOO, in which yod is historically absent, as in *too* [tu] (cf., Table 2, rows 17-18). Canadian English has retained yod to a greater degree than have US varieties, despite regular indications of a longitudinal shift toward yod-less pronunciations (e.g., Clarke 1993; de Wolf 1993; Boberg 2010). Given the conservative status of yod retention in Canadian English and the local historical context (geographically

peripheral and socially insular), yod is a feature of potential heuristic value for determining the degree to which the city's local variety does or does not reflect broader linguistic norms.

3.2. Exclusions and Target Words

Because liquids have considerable co-articulatory effects on adjacent vowels (e.g., Lehiste 1964; Harrington & Cassidy 1999), we excluded pre-rhotic tokens (except those in the *START* set) and pre-lateral tokens. The only exceptions were /ul/ and /ol/ words. Foreign borrowings, as determined by Boberg (2010:140), were also set aside because they displayed variable realizations that likely derive from variation in the underlying phonology. This resulted in a final dataset of 9082 tokens, as summarized in Table 2.

3.3. Acoustic Measurement and Normalization Procedures

The word-list files were annotated using Praat (Boersma & Weenink 2015). The Forced Alignment and Vowel Extraction (FAVE) measurement technique (Rosenfelder et al. 2011) was then operationalized for vowel measurement; FAVE output was double-checked for accuracy. To most closely approximate the methodological approach reported in Boberg (2008), we used FAVE's default measurement method, which measures each vowel at one-third of its duration. Exceptions to this were the front up-gliding *FACE* vowel (measured at maximum F1), the back up-gliding *GOAT* vowel (measured halfway between the beginning of the segment and maximum F1), and *TOO* and *NEW* (measured at the beginning of the segment). The PCE measurement point for these vowels was maximum F1 (Boberg, personal communication, October 14, 2016), which could not be replicated with FAVE. As such, the measurement points for *FLEECE*, *TOO*, and *GOAT* differ between studies. These relatively minor methodological discrepancies are discussed further in the presentation of results. To increase comparability with the PCE, we adopted the same normalization algorithm used by Boberg (2008), following Nearey (1978). We calculated a natural log from both the group mean (F1/F2 together) and the mean for each speaker's data. We then calculated a scaling factor for each speaker based on the difference between the two means; this was used to normalize each speaker's data.¹⁰

For yod we adopted an alternate methodology. Despite this feature being relatively well studied, the acoustic characteristics that distinguish retention versus loss (dropping) remain fairly obscure, for the simple reason that they are rarely reported. Even in Labov, Ash, and Boberg (2006) the details are sparse; they noted that when yod was elided, a more fronted nucleus (F2) sometimes maintained a distinction between the yod and non-yod sets (2006:54). Labov, Ash, and Boberg (2006:38) measured formant values "at the point where F1 reached its maximal value" and then took F2 at the same point. This suggests that F2 may be a useful criterion for yod identification, but the specific acoustic qualities of dropping versus retention were not explored.

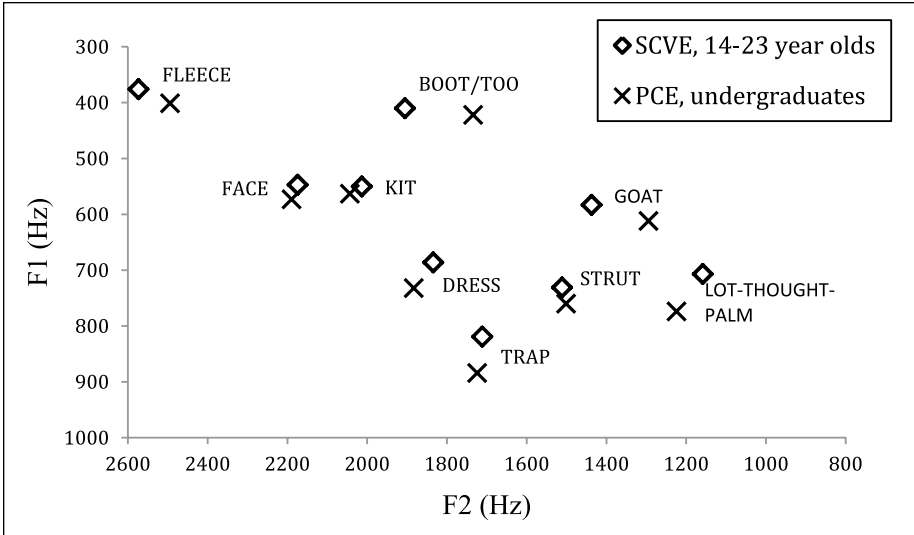


Figure 2. Mean F1/F2 for Speakers Aged 14-23 in SCVE ($N = 16$) and Boberg 2008 ($N = 86$)

We apply a more comprehensive instrumental approach. In a preliminary perceptual study, GOOSE tokens from a subset of the SCVE speakers ($N = 15$) were classified according to audible presence or absence of yod. In this task, carried out independently by each of the authors, the three-way inter-rater agreement rate was 81 percent ($N = 192$); non-unanimous tokens were set aside. Discrete measurements of vowel formants were then made at twenty time points across vowel duration. ANOVA testing revealed that the perceptual contrast between yod and non-yod was reflected most consistently in F2 at 25 percent of vowel duration, with a mean difference of 737 Hz. Since the nearest equivalent time point used by FAVE is 20 percent, that point was substituted in subsequent analyses. ANOVA testing also reveals the expected effect of GENDER related to F2 values on unnormalized data ($F = 122.4, p < .001$), which follows from physiological sex differences. In the analyses that follow, an acoustic diagnostic was selected for determining yod occurrence, set as the first quartile value of F2 within the perceptually classified set of yod tokens (i.e., including the upper 75 percent of that distribution). This value was determined on a per-gender basis: women, 2258 Hz; men, 1916 Hz. We elaborate on this when we discuss the results.

4. Results

The features that we consider represent a wide range of regional patterns. In what follows, we systematically work through each, examining their synchronic status in Victoria through two main lenses: comparatively, with Boberg (2008, 2010), and temporally, across apparent time. To first set the baseline, we can ask how the synchronic reality among younger speakers compares to the national picture presented by the PCE.

Figure 2 compares vowel means from young Victorians to Boberg's (2008) regionally balanced means for the PCE undergraduates, which he provides as "an abstraction developed for purposes of comparative analysis" (2008:135).¹¹ The PCE corpus was compiled between 1999 and 2005 (Boberg 2010:144), meaning that the youngest speakers were born no later than 1987. Our baseline comparison for the SCVE is speakers born 1989 to 1998. To maximize comparability, the SCVE data in Figure 2 were normalized using the group F1/F2 mean (1119 Hz) and the natural log (7.02) from the PCE.

The overall picture from Figure 2 is one of large-scale parallelism: the PCE and SCVE points generally approximate each other. Nonetheless, differences are evident. TRAP is higher in the SCVE than in the PCE, a result which may relate to the status of the Canadian Shift in Victoria. LOT-THOUGHT-PALM is also somewhat higher than the PCE mean, as well as slightly backer. Phonetically it is in the [ɔ] range, with a mean F1 close to that of DRESS, akin to the realization of the merged low back vowel that has been reported in California (e.g., Aiello 2010).

BOOT/TOO also presents a point of contrast, which we take as reflective of two factors: the more recent collection date of the SCVE materials and measurement point. This latter observation also affects FLEECE and GOAT. Given well-established vowel trajectory patterns, the means would almost surely be closer if taken at the same time point in the acoustic signal, although this remains to be verified definitively. As discussed above, in the SCVE data FLEECE was measured at one-third of duration, whereas the PCE measurements were taken at maximum F1—the beginning of the trajectory for an up-gliding vowel. This means that in Figure 2, FLEECE in the SCVE is positioned one-third of the way into the vowel. The fronted position of BOOT/TOO in the SCVE relative to the PCE can be similarly explained. In the SCVE, post-coronal tokens were measured at the beginning of the vowel but post-labial ones were measured at one-third of vowel duration, which would be a more fronted position. This would explain the more fronted data point, although as we discuss below, there is considerable variation for this vowel both within and across speakers in the SCVE. GOAT is more difficult to compare between studies. In the SCVE, GOAT was measured halfway between the beginning of the segment and maximum F1, whereas it was measured at maximum F1 in the PCE.¹² As a result, GOAT appears higher and fronter in the SCVE because it is midway through the descending trajectory of the vowel as it moves toward the nucleus.

4.1. The Canadian Shift

The PCE data indicate that the Canadian Shift is a cross-Canada development (Boberg 2008:136). To begin to assess its status in Victoria, we first consider KIT, DRESS, and TRAP in apparent time, as in Figure 3. Means for the oldest speakers, born between 1913 and 1941, are shown with solid black symbols. In order to simplify the figure, only means for the oldest, middle, and youngest cohorts are shown. MANCOVA indicates that the oldest group is significantly differentiated from the other groups for all six parameters measured—F1/F2 of KIT, DRESS, and TRAP ($p < .001$; F -ratio range between 13 and 38; partial eta-squared range between .138 and .306).¹³ Such results suggest that the Canadian Shift has been underway in Victoria since before the middle of the twentieth century.

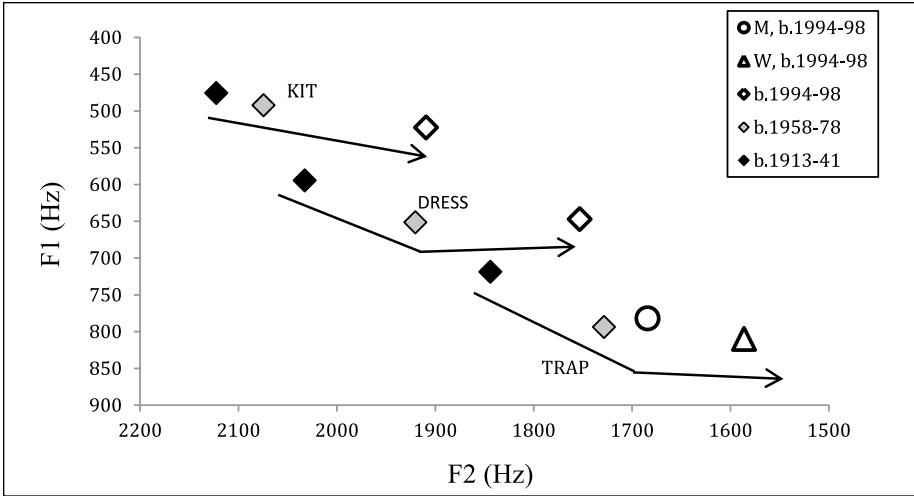


Figure 3. Mean F1/F2 for Canadian Shift by AGE and GENDER (for TRAP only)

The observed apparent-time trajectory of DRESS concurs with the proposal that retraction is a more pronounced direction of change only after significant lowering has occurred (Kettig & Winter 2017). This pattern is also apparent in the results. In general, when a vowel lowers along the outer front edge of the vowel space, some concurrent retraction inevitably occurs as a result of physiological factors (see Figure 7); it is the observed subsequent centralization of KIT, DRESS, and TRAP that we refer to here. In parallel with Boberg (2005a), the F2 of DRESS demonstrates the largest change overall ($F = 11.302$, $p < .001$, partial eta squared = .305). TRAP is the lowest vowel in the acoustic space and, beginning with speakers born in 1942, it appears to have reached its lower limit. From that point forward, the primary vector is retraction.

In fact, for each Canadian Shift vowel the large difference in means across age groups suggests dramatic change among speakers born since the Second World War (WWII). This period is also noted as a turning point in the Canadian Shift by Roeder and Jarmasz (2010) for another Canadian locale, Toronto. However, the rate of change appears to have increased in Victoria with speakers born around 1940 and later; in Toronto it slowed among speakers born in this period, appearing to have been nearing the end of its S-curve, and a similar observation was made for Thunder Bay, in northwestern Ontario (Roeder 2012). In Victoria, robust change has been ongoing across apparent time.

At the same time, GENDER only emerges as a main effect for F2 of TRAP, with women born in 1979 and later patterning roughly a generation ahead of men ($F = 7.396$, $p < .001$, partial eta squared = .223) (see also Pappas & Jeffrey 2013). MANOVA (which was controlled for phonological environment and takes speaker into account as a random variable) indicates the effect to be most distinct among the youngest speakers, born 1994 to 1998. The lack of a main effect of GENDER is striking, but it is possibly due to considerable variation within the sample, a predictable result of rapid change at the community level.

What emerges from these results is that—assuming that KIT, DRESS, and TRAP had similar starting points across regions—the Canadian Shift appears to be more recent in

Victoria than elsewhere (e.g., Toronto, Thunder Bay, Montreal). This is consistent with Victoria's more peripheral status historically (geographic and social), but it raises another question. If we accept the hypothesis that the shift was triggered by the merger of the low back vowels (Clarke, Elms & Youssef 1995), when did it entrench in Victoria? In other words, the diachronic status of the Victoria vowel system is directly implicated in patterns of change over time.

When speakers born before 1941 are excluded from the analysis, a MANCOVA of AGE and GENDER shows no significant F1/F2 differences between LOT, THOUGHT or PALM. However, when the older speakers are included, the Tukey *b* post hoc test reveals that the oldest group has a significantly higher THOUGHT and more fronted PALM than the rest of the community, and linear regression indicates change over apparent time for both the F1 of THOUGHT ($F = 11.886, p = .001, R^2 = .096$) and the F2 of PALM ($F = 9.403, p = .003, R^2 = .077$). The significant *p* value despite a low *R*-squared reflects the fact that, even though AGE does not correlate with the dependent variable for speakers born after 1941 ($N = 86$), it does correlate significantly for those born before then ($N = 28$). This strongly suggests that the back vowels were not stable in early twentieth-century Victoria English, with the merger going to completion only with speakers born after 1940.

As for the status of the merger in western Canada more generally during the mid-twentieth century, Boberg (2010:128) provides a detailed synopsis of the relevant contemporary observations. He notes that the merger was documented in Vancouver by Gregg (1957:21-22) and in Saskatchewan by Lehn (1959:93), though data collected in 1949-1950 and reported on in Allen (1976: vol. 3, 39-41, 156-157) brings into question whether the merger was yet fully completed in rural areas of northwestern Ontario, Manitoba, and Saskatchewan. It may be the case that Victoria patterns similarly to non-urban areas of western Canada in this regard. Given the city's history, this is not anomalous. Victoria's isolation was an ideal linguistic preserver across its first one hundred years, allowing a more conservative model to persist through to the WWII period.¹⁴ In Victoria, a later onset of this merger would be consistent with the dramatic trajectory of the Canadian Shift over the last eighty-five years.

In sum, the Canadian Shift appears to have had a later onset in Victoria than observed elsewhere, yet younger speakers pattern closely with general Canadian norms as captured by the PCE for these lexical sets (Figure 2). This suggests robust change over apparent time. Considered together, these results intimate that older Victorians are less mainstream (i.e., are more conservative) with respect to the quality of the Canadian Shift vowels, despite the innovative realizations used by younger Victorians.

4.2. Back Vowel Fronting

Another change affecting Canadian English on a national level is back vowel fronting (only the Maritimes and Newfoundland and Labrador appear to resist this trend; Boberg 2008). Since no direct comparison is being made to the PCE data, this portion of the analysis relies on data normalized using the SCVE corpus-internal F1/F2 mean (1072 Hz) and natural log (6.98). As a first approximation of the Victoria system, Figure 4 presents the results for BOOT, GOAT, and FOOT. All are fronting over apparent time, aligning the variety with the broad trends affecting North American varieties of English (Boberg 2010), but there is no effect of GENDER for F1 or F2 for any of these sets.

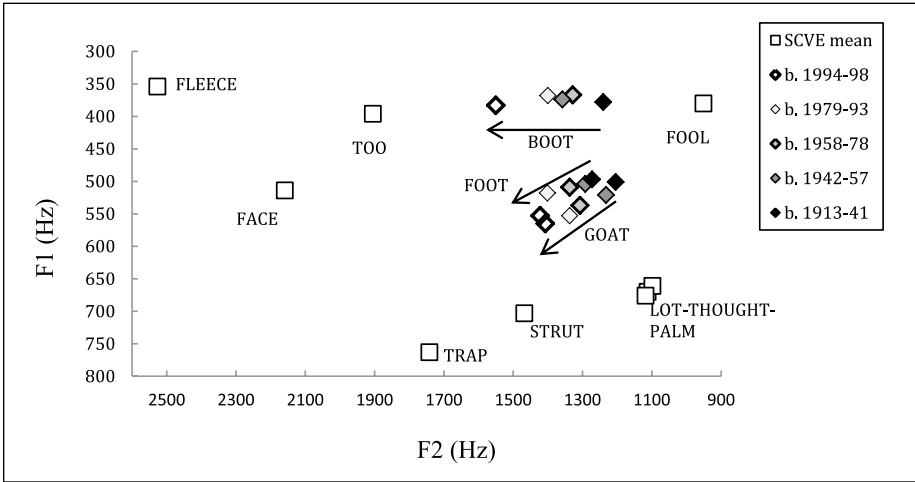


Figure 4. Fronting of BOOT, GOAT, and FOOT Across Apparent Time in the SCVE

The results in Figure 4 reveal the expected allophonic variation for BOOT, TOO, and FOOL. Linear regression results for BOOT indicate significant apparent time change along the F2 dimension (fronting); there is no significant change in F1. When considered relative to the retraction of TRAP in Figure 3, the tendency for the F2 of BOOT/TOO and TRAP to converge over apparent time (as BOOT fronts and TRAP backs) is clearly manifest (see Boberg 2008, 2010).

The normalized mean F2 for TOO of 1905 Hz situates Victoria alongside most of North America as dramatically fronted, although the effect may be exaggerated here because TOO was measured at the beginning of the segment, where co-articulatory effects of the coronal consonant are strongest. As we discuss below, TOO has experienced rapid change over apparent-time. For GOAT and FOOT, linear regression indicates significant change in both F2 (fronting) and F1 (lowering).¹⁵ The statistics are presented in Table 3.

Although the F1/F2 means for GOAT and FOOT are very close for the youngest speakers, born 1994 to 1998 (ages 14-18), several factors not examined here likely preserve the distinction between these vowels. GOAT is diphthongal whereas FOOT is monophthongal. There may also be effects of conditioning environment that distinguish words within the GOAT set from each other and from words in the FOOT set. Ward (2003) observed similar movement over apparent time for BOOT, GOAT, and FOOT, but noted a distinction in means for GOAT in syllable-final and pre-consonantal position.

Following the results in Boberg (2008:150), the fronted positions of BOOT/TOO and GOAT among younger speakers position Victoria with Vancouver as urban and innovative. Our observations also implicate FOOT in fronting of the back vowels over apparent time. An additional component of back vowel fronting relates to correlations between the trajectories of these three lexical sets at the level of the individual speaker; linear regression results between each of the parameters undergoing change are presented in Table 4.

Table 3. Change over Apparent Time for F1 and F2 of FOOT, GOAT, and BOOT

| Variables (linear regression) | F-ratio | p value | R-squared |
|-------------------------------|---------|---------|-----------|
| F2 BOOT | 16.97 | <.001 | .134 |
| F1 GOAT | 33.87 | <.001 | .235 |
| F2 GOAT | 44.03 | <.001 | .286 |
| F1 FOOT | 9.35 | .003 | .077 |
| F2 FOOT | 37.17 | <.001 | .249 |

Table 4. Correlations between F1/F2 of FOOT, GOAT, and BOOT

| Variables (linear regression) | F-ratio | p value | R-squared |
|-------------------------------|---------|---------|-----------|
| F2 GOAT / F2 BOOT (women) | 18.55 | <.001 | .249 |
| F2 GOAT / F2 BOOT (men) | 4.68 | <.035 | .083 |
| F2 FOOT / F2 BOOT | 55.41 | <.001 | .335 |
| F1 FOOT / F1 GOAT | 84.87 | <.001 | .431 |
| F2 FOOT / F2 GOAT | 21.08 | <.001 | .158 |

The regression results reveal significant correlations between all of these formant measurements. The correlation between the F2 of GOAT and the F2 of BOOT is more robust for women than men such that, particularly in the speech of women, if a speaker displays fronted GOAT, they are likely to also display fronted BOOT. For this reason, the correlations are shown separately for men and women. In contrast, aggregate results are presented for FOOT because the same correlations are statistically significant for both men and women. The results indicate that position of the FOOT vowel is strongly correlated with both BOOT and GOAT, particularly with respect to the F2 dimension for BOOT and the F1 dimension for GOAT. Given that each set is changing over apparent time (BOOT over F2, GOAT and FOOT over F1 and F2), the results in Table 4 provide compelling evidence that back-vowel fronting is a systemic process in Victoria. When a speaker is innovative with respect to one of these features, they are likely to be innovative with respect to the others. In other words, these vowels are moving in tandem.

4.3. Relative Positions of BAN and BAG

A diagnostic characteristic of the Western Canadian dialect region concerns the relative positions of BAN and BAG, where instead of lowering and retracting, the vowel raises and fronts. Following Boberg (2008), we use Cartesian distance on vowel means to assess the relative positions of these sets and compare Victoria to the PCE data in other regions, shown in Figure 5 (to facilitate the comparison, the SCVE data were normalized using the PCE group F1/F2 mean and natural log). In this figure, the distance between BAN and TRAP is measured on the x-axis; that between BAG and TRAP is measured along the y-axis. The dashed black line indicates the median point, at which BAN and BAG are equidistant from TRAP—in this case, in the same direction and overlapping in F1/F2 acoustic space.

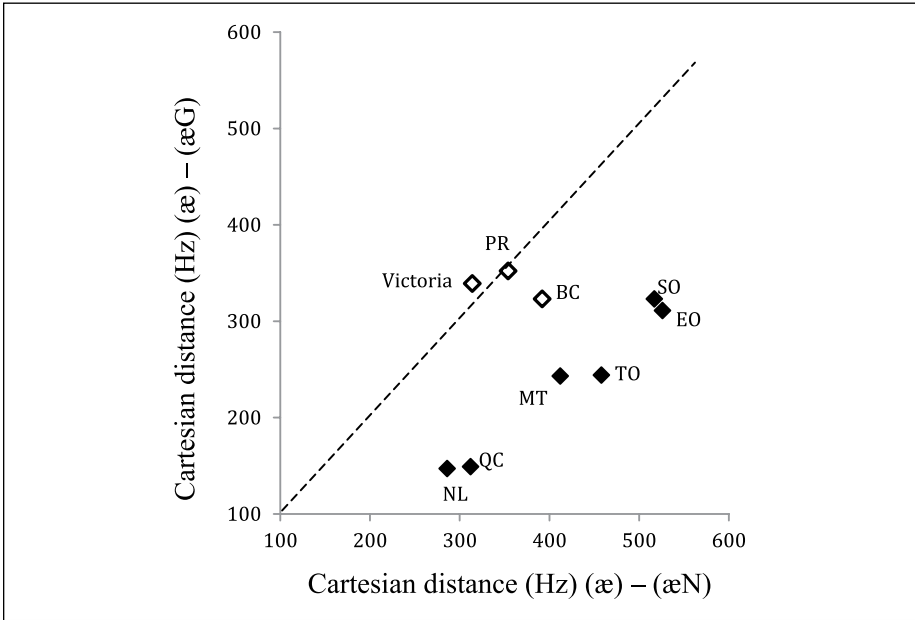


Figure 5. The Relative Position of BAN and BAG Across Canada

(Adapted from Boberg 2008:147, Figure 4. BC = British Columbia; PR = Prairies; SO = southern Ontario; TO = greater Toronto; EO = eastern Ontario; QC = Quebec; MT = Maritimes; NL = Newfoundland and Labrador).

Figure 5 indicates that Victoria patterns with BC and the Prairies, set apart from other Canadian areas: BAN and BAG are raised and fronted to a similar degree and are in relatively equidistant positions along both the x- and y-axes. Notably, these results include data from our full SCVE sample (not only younger speakers, as with the PCE data points). This is because MANCOVA shows that neither BAN nor BAG has undergone significant change over apparent time; GENDER does not correlate with variation either. This suggests that raising of BAN and BAG, iconic of the Western Canadian dialect region, is a stable feature of the local dialect, one that has characterized Victoria English for at least eighty-five years, dating to speakers born as early as 1913.

4.4. Retraction of the START Vowel

The relative position of START is one of the most regionally distinct features of Canadian English (Boberg 2008, 2010), with the vowel significantly more retracted in the West and in Quebec than elsewhere. Figure 6, adapted from Boberg (2008:144), shows the regional F2 means from the PCE; we have added Victoria. This mean includes data from all 114 speakers. As with BAN/BAG, there is no statistical evidence of either change over time or an effect of GENDER for either F1 or F2 of START in the SCVE.

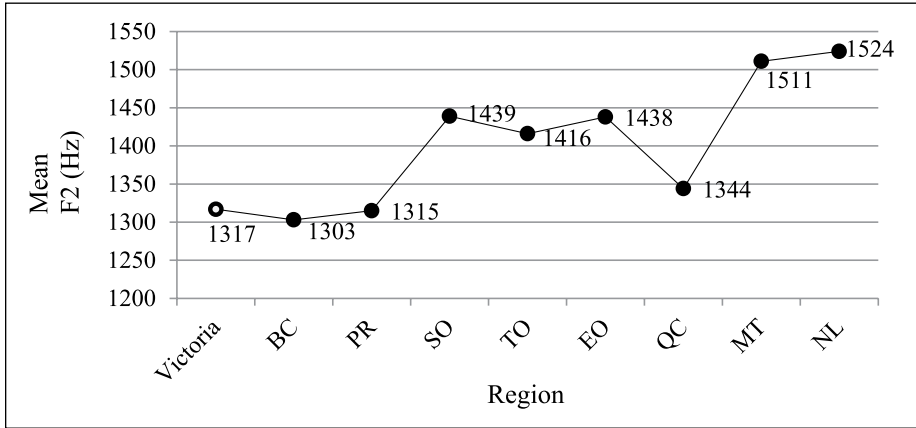


Figure 6. Mean F2 of START (in Hz) by Region, From West to East

(Adapted from Boberg 2008:144. BC = British Columbia; PR = Prairies; SO = southern Ontario; TO = greater Toronto; EO = eastern Ontario; QC = Quebec; MT = Maritimes; NL = Newfoundland and Labrador).

That there is no effect of AGE suggests longitudinal stability of retracted START in Victoria. Moreover, the SCVE mean is very close to those for BC and the Prairies, placing it firmly within the Western dialect region. In other words, for this feature—as with BAN/BAG—Victoria has consistently patterned with surrounding dialects of Canadian English across the twentieth century.

4.5. Yod

The final feature we consider is yod. Variable yod dropping advanced in English via lexical diffusion, and it remains robustly constrained by lexical item (Avis 1956; Phillips 1981). We focus on retention, as it is the traditional realization. In the SCVE, using the acoustic diagnostics outlined above, yod is retained 39.5 percent overall ($N = 440$). Compared to both self-report and production data, all of which come from older datasets, this rate of maintenance is striking, diverging from the lower rates of retention that are typically reported in the literature (cf., Clarke 1993, 2006; Gregg 2004). When considered by individual lexical item, the rates vary across a wide range: 22.3 percent (*due*; $N = 112$), 37.2 percent (*tube*; $N = 113$), 47.7 percent (*new*; $N = 111$), 51.0 percent (*student*; $N = 104$). Crucially, none is particularly low.

Although yod retention is considered prestigious in Canadian English (e.g., Clarke 2006), leading us to predict a main effect of GENDER, a Pearson's chi-square test indicated no significance for this predictor ($\chi^2 = 0.00085773$, $df = 1$, $p = .9766$). Likewise, AGE, which functions as diagnostic of historical stages, reveals no significant differences across apparent time ($\chi^2 = 1.8106$, $df = 4$, $p = .7705$). Indeed, the age pattern for each word in the NEW set is indicative of stability: the medians and interquartile ranges are remarkably consistent across cohorts (though there is variability with respect to the internal rate distributions).

This result runs in opposition to research on yod in Canadian English to date, which has consistently reported ongoing loss. If yod is relatively stable in Victoria (though also apparently characterized by large community-internal variation), then this—in addition to the high overall rate of retention—would suggest that local English remains relatively conservative with respect to this feature. However, it is possible that what looks like retention of yod overlaps acoustically with a bona fide ongoing change in Canadian English: the fronting of *TOO* (see also Sóskuthy et al. 2015).

Among coronal tokens that did not contain yod historically (i.e., the *TOO* set), fronting is evident in increasing F2 values over apparent time. Separate linear regression analyses on speaker means for unnormalized post-coronal *TOO* indicate significant change for both men ($F = 24.6, p < .001, R^2 = .317$) and women ($F = 30.56, p < .0001, R^2 = .338$). In fact, *TOO* is fronting even more aggressively than non-post-coronal *BOOT* in Victoria speech: F2 has increased steadily from a mean of 1834 Hz among the oldest speakers (71 to 98; years of birth 1913–1942), to 2030 Hz for the youngest ones (14 to 19; years of birth 1994–1998), a total increase of 196 Hz. For *NEW*, the comparison values are 2005 Hz and 2039 Hz respectively. Additionally, F2 values for the *TOO* set have steadily encroached on those of *NEW*; within the youngest age group, they are virtually indistinguishable. This creates an acoustic overlap in F2 space, one that cannot be disambiguated from genuine retention of yod in post-coronal contexts using the methods we have operationalized here. This ambiguity may extend to the realm of audition as well. During the initial classification phase, 11 percent of tokens we unanimously classified as containing an audible yod were *TOO* words, and thus contained not yod but only a highly fronted [u] (the majority of such tokens were produced by speakers in the youngest age bracket). As such, while it appears that Victoria has maintained a conservative feature of Canadian English, one that is historically associated with Anglo-Canadian identity (Pringle 1985; Clarke 1993, 2006), the confound of *BOOT/TOO* fronting means that this interpretation must be treated cautiously.

5. Putting the Pieces Together

Phonological simplification is common to areas that have experienced extensive dialect mixture and rapid population growth (Labov, Ash & Boberg 2006:214). It is possible that the Canadian Shift and back vowel fronting, both of which may have been triggered by phonological merger (a process of simplification), were established during periods of such demographic change in the North American dialects where they appear. If we accept this premise, then it is unsurprising that similar trajectories are observed for the *KIT*, *DRESS*, and *TRAP* vowels, as well as for *BOOT*, *GOAT*, and *FOOT* in both Canada and the American West. A number of studies have reported parallel back vowel fronting in the speech of young people in California (e.g., Hall-Lew 2009; Kennedy & Grama 2012) and Oregon (e.g., Ward 2003; Becker et al. 2016). In northern California, *BOOT*, *GOAT*, and *FOOT* fronting constitute part of a well-documented series of changes referred to as the California Shift that also includes the Canadian Shift-like movement of *KIT*, *DRESS*, and *TRAP* (e.g., Kennedy & Grama 2012). Figure 7 pulls together Figures 2 and 4, illustrating a similar pattern in Victoria.

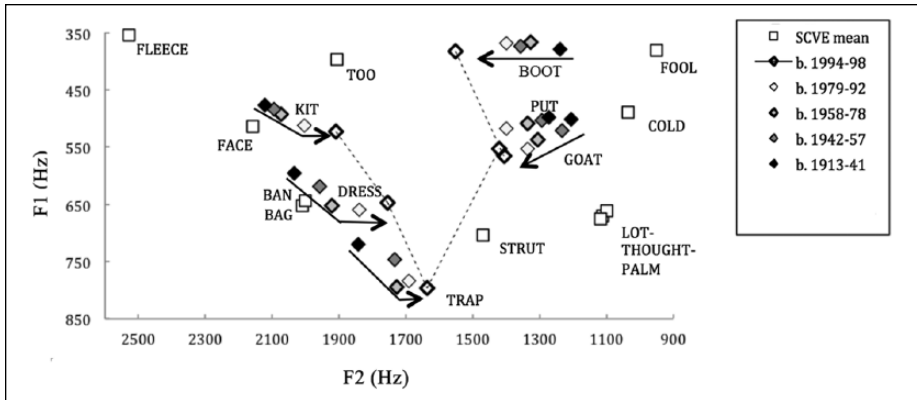


Figure 7. Centralization of KIT, DRESS, TRAP, BOOT, GOAT, and FOOT in the SCVE

In Figure 7, means for the youngest SCVE speakers for the vowels under examination here are connected with dashed lines. It is clear that across apparent time, speakers are increasingly using the middle of the acoustic speech range for these vowels, creating a configuration similar to that from the Canadian PCE results (cf., Figure 2).¹⁶ In other words, there is a widespread pattern that includes both the Canadian Shift and back vowel fronting. Roeder and Gardner (2013) propose that, as a consequence of the low back merger, TRAP became underspecified for backness, which facilitated its phonetic centralization and moved the system toward a triangular configuration that includes one low point vowel (see also Roeder & Jarmasz 2010; Boberg 2010, 2011). Such simplification of the inventory is consistent with hypotheses concerning extensive mobility and dialect mixing that characterized Canada and the US West throughout the late nineteenth and twentieth centuries (cf., Labov, Ash & Boberg 2006).

The centralizing tendencies observed for front KIT and DRESS and back GOAT and FOOT, on the other hand, may be purely phonetic. Roeder and Gardner (2013) propose that the lowering and retraction of KIT and DRESS was driven by phonetic analogy with TRAP (cf., Durian 2012) and by dispersion away from the outer front envelope of the vowel space. Similarly, fronting and lowering of FOOT and GOAT may reflect phonetic analogy with BOOT. Labov (2010:148), for example, states that “fronting of /ow/ is independent of any chain shifts, being essentially a parallel response to the fronting of /uw/.” With few exceptions (e.g., eastern New England, parts of Minnesota, Wisconsin, and northern Illinois), TOO fronting is ubiquitous in North American Englishes (Labov, Ash & Boberg 2006:154). Labov (2010:107) argues that the merger of TOO and NEW (as a consequence of yod dropping) has resulted in a fronted category that acts as a trigger for the fronting of BOOT. This hypothesis is compatible with the findings from Victoria, which indicate more extensive fronting of TOO over apparent time than BOOT in other environments. The result is that the range covered by the allophonic distribution of /uw/ covers most of the top of the vowel space (cf., Figure 7), a common pattern (Labov 2010:109). In this sense, the SCVE results align not only with broad sociophonetic processes in North American dialects but also with their phonological underpinnings.

6. Joining the Western Region (Mostly)

Walsh (1924:110) wrote that “plain, unpretentious Canadian is a lost language in Victoria.” If this was ever a reality outside the Tweed Curtain, it is certainly untrue in the city’s contemporary sociolinguistic ecology. The comparative sociophonetic evidence reveals a sound system that largely mirrors the innovative national patterns reported by Boberg (2008, 2010). This provides corroboration for Boberg’s observations and enriches ecological descriptions of (southern coastal) BC English and Western Canadian English. At the same time, the SCVE results reflect the region’s history. While the matched word-list data aligns younger Victorians with their Canadian peers, the apparent-time trajectory is characterized by rapid leveling to supralocal norms among speakers born in the decades after 1940 (Canadian Shift, back vowel fronting) alongside longitudinal stability of definitional Western Canadian features (BAN/BAG raising, START retraction) and maintenance of conservative features (retention of yod). The former exposes Victoria’s alignment with large-scale shifts affecting North American Englishes; the latter provides important insights to earlier stages of (Western) Canadian dialects.

These observations have implications for comparative sociophonetics and regional dialectology. Maintenance of yod imbues local speech with a hint of the conservative and reflects a small yet tenacious aspect of the city’s roots. The longitudinal persistence of START retraction and BAN/BAG raising, on the other hand, lead us to believe that these features were entrenched across the twentieth century. Considered in tandem with Victoria’s historically (geographic and social, if not political) peripheral status, this suggests that these features are rooted in BC and the Prairies more generally, reflecting diachronic isoglosses that may have long demarcated the Western dialect region. In contrast, the merger of LOT-THOUGHT-PALM may have occurred more recently in Victoria than elsewhere in Canada. If this is the case, then this would explain the observation that the Canadian Shift also appears to have had a later onset in the city (assuming the two are linked; Clarke, Elms & Youssef 1995). Chambers (2008) hypothesized that the merger of the low back vowels can be traced to the turn of the nineteenth century in Canadian English (see also Dollinger 2010). Although this predates extensive westward migration, the SCVE results suggest that the low back merger was not inherited whole-scale from westward migration in Victoria; rather, it is a product of mid-twentieth-century change. If such is the case, then it problematizes widely held assumptions regarding a single input source as the foundation of Canadian English (e.g., Bloomfield 1975; Chambers 2004; see also Denis & D’Arcy forthcoming).

When considered in the context of the city’s history, the bulk of our results suggest that Victoria has adopted ongoing changes in Canadian English via diffusion, perhaps from Vancouver. The evidence from the Canadian Shift and back vowel fronting indicates that young Victorians pattern closely with their peers across Canada, though change has been relatively recent and has progressed quickly. Specifically, once much of the isolation that formerly marked the region was lessened, leveling to supraregional patterns advanced at an accelerated rate, enabling the variety to effectively “catch up” to the urban centers captured in the PCE (Boberg

2008, 2010). This is not surprising (contact is a critical vector for linguistic change), but it is striking to see how rapidly change can progress, given the right circumstances.

At the same time, British Columbia is a large province. Vancouver and Victoria are both coastal, southern, and urban. We leave it to future research to explore the possibility of other boundaries within the province, and to test further the generalizability of Boberg's (2008, 2010) classification of the province as a reified dialect region.

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Notes

1. Except in cases where he does not distinguish between allophonic contexts (e.g., *NEW*, *TOO*), we use the standard lexical sets provided in Wells (1982) to refer to vowel phonemes.
2. We limit the discussion here to features of accent, yet multiple examples from the lexicon also exist (e.g., Chambers 1995; Boberg 2005b; Dollinger 2012).
3. Although education has historical significance in Victoria (e.g., Barman 1984; Trueman 2009), it regularly failed to exert a significant effect on variation in our dataset and so we do not report on it here.
4. Other traces include High Tea at the Empress Hotel, a popular tourist activity, and the playing of "Rule, Britannia" when the local hockey team scores a goal.
5. This description is based on contemporary recordings of locals held by the third author. The following excerpt, from an oral history in the Victoria English Archive (held by agreement with the University of Victoria Archives: Cecilia Bullen, b.1889), highlights the saliency of this accent: "After a bit she said to me 'What part of England do you come from?' And I

said ‘But I don’t. I was born here in Victoria.’ ‘Oh’ she said ‘I would never have believed it from your ultra English accent.’ I said ‘I don’t think there’s anything remarkable about my accent. I’m born here. I speak just as my parents taught me to speak.’ I hadn’t been born somewhere else. I said ‘No I’m very proud of being a native of Victoria.’”

6. The word-list was automatically randomized at every presentation. The format was uncompressed .wav files, recorded at a sampling rate of 44.1 Hz and a depth of 16 bits.
7. Boberg (2008, 2010) divided Canada into six dialect regions: the West (itself divided into two sub-regions: British Columbia and the Prairies—Alberta, Saskatchewan, Manitoba), Ontario, Quebec, the Maritimes (i.e., New Brunswick, Nova Scotia, Prince Edward Island), and Newfoundland and Labrador.
8. We excluded *sanity*, part of the BAN set, from the analysis. It did not pattern with other words in this lexical set, alternating between monophthongal and diphthongal realizations.
9. We excluded *tool* from the GOOSE set. It had an average F2 of 1448 Hz, midway between the post-coronal and pre-lateral averages, meaning that it did not pattern unambiguously with one set or the other.
10. The dataset used for normalization included the PRICE, MOUTH, and CHOICE diphthongs (not included in the current analysis), pre-rhotic FORCE, NEAR, NORTH, NURSE, and SQUARE, and pre-lateral GOAT. This resulted in 13,513 normalized tokens.
11. Boberg (2008) does not provide a comprehensive set of vowel means for the PCE speakers from BC (eight women, four men).
12. This measurement point is a consequence of the default settings in FAVE extract. The differences in measurement points between studies for FLEECE, GOOSE, and GOAT only affect the comparison with Boberg’s (2008) PCE data for young speakers and do not compromise the analysis of change over apparent time for this vowel in Victoria speech.
13. To ensure comparable variance of the dependent variable across groups, both Levene’s test of equality of covariance and Box’s test of equality of covariance matrices were used in all MANOVA and MANCOVA calculations presented here.
14. That WWII marks an important transition period in Victoria is likely the result of multiple factors. First, as outlined in Tagliamonte, D’Arcy, and Louro (2016), the end of the war heralded a new period of expanded international relations, affecting business, travel, and education. This era was quickly followed by major technological advances, including the introduction of the jet engine. These new realities would have directly impacted Victoria’s social and geographic isolation, creating tighter transportation and social networks with the mainland at a time when speakers born during and immediately after the war were entering their teens.
15. As with the FOOL sub-set of GOOSE, GOAT exhibits a strong tendency to retract in the pre-lateral environment. As raised in the methods section, these tokens were analyzed separately; MANCOVA showed no change over apparent time.
16. AGE does not correlate with FLEECE or LOT/THOUGHT/PALM; for these sets only the full SCVE means are shown.

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