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## Article

# Subject relative *who* in Ontario, Canada: Change from above in a transplanted ecology

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## Abstract

*Who* as a restrictive relativizer in English is an old change from above. In urban dialects, it still acts as a prestige form, whereas it is infrequent or negligible in rural British and American varieties. We compare earlier findings from Toronto, the largest city in the province of Ontario (D'Arcy & Tagliamonte, 2010), with a range of communities from the Ontario Dialects Project (Tagliamonte, 2003–present). While none of the rural locations has as much *who* as Toronto, there is a substantial range. Regions along the major highways to the north and east of the city have more *who*, while the smaller towns in less accessible locations have less, consistent with a Cascade Model effect (Labov, 2003). Nonetheless, *who* shows evidence of diffusion, increasing in apparent time in recent decades. We suggest that this reflects overt pressure from above, consistent with the enduring role that prestige plays in English relativizer variation.

**Keywords:** Dialectology; Canadian English; language variation; language change; cascade model; relative clauses

## 1. Introduction

Restrictive relative clause markers in contemporary English, as in (1), have long been a reliable source of insight into social and linguistic processes in the study of language variation and change.

(1a)  And she also makes this one dish WHICH is like really really simple.
      (Carrie Tippman, F 18, Temiskaming Shores)
(1b)  There's people THAT's coming into this country Ø seems to want to be alone.
      (Otto Reichert, M 84, North Bay)
(1c)  I'm making up swears like the guy WHO stubbed his toe.
      (Chelsea McMac, F 22, South Porcupine)

The introduction of the relative *who* into English is one of the most well-studied changes from above on the morphosyntactic level (Romaine, 1982:213). Like the other *wh-* relativizers, it originated in the fifteenth century, likely introduced by the educated sector of society (Ball, 1996; Mustanoja, 1960). From the start, the *wh-* forms have functioned as highly standard forms (D'Arcy & Tagliamonte, 2010; Macaulay, 1991), while their major covariants—*that, which*, and the zero—have not. With subject gaps, the relative *that* can be either neutral (if the head noun is [-human]) or prescriptively frowned upon (if it is [+human]). The variant *which* is now unusual as a subject relativizer in Canadian English (Jankowski, 2013), and the zero-subject relativizer is certainly nonstandard and notable in normative dialects of English, including urban Canada (D'Arcy & Tagliamonte, 2010). This has led to the choice of subject relativizers being particularly sensitive to prestige, which

may be discerned in effects of education, occupation, class, and gender (Levey, 2006:65; Levey & Hill, 2013:37; Tottie, 1997:245).

Regional distribution, particularly the continuum between urban and rural, is also heavily implicated in the choice of forms. Relative *who* is most prevalent in urban varieties, at least in British and Canadian English (Cheshire, Adger & Fox, 2013; D'Arcy & Tagliamonte, 2010; Levey, 2006; Quirk, 1957; Tagliamonte, Smith & Lawrence, 2005b:93; Tottie, 1997). Beyond urban conurbations, a great deal of diversity is reported for the inner workings of relativizer systems (Ball, 1996:239; Geisler, 2002; Tagliamonte et al., 2005b; Tagliamonte, 2013). However, multiple researchers point out that there have been comparatively few studies of relativizers in rural, blue-collar, or otherwise nonstandard dialects (Ball, 1996:239; Bayley, 1999; Levey, 2006:46; Tagliamonte et al., 2005b:76; Tottie & Rey, 1997:219). One exception is Tagliamonte et al. (2005b), who demonstrated that the relativizer systems of four rural hamlets of the rural United Kingdom mostly lacked *wh-*relativization. The authors argued that the *wh-* relativizers never infiltrated these smaller and more remote places, at least not up to the oldest generation at the end of the twentieth century (Tagliamonte, 2013). The present study begins with this foundation and asks the question: what is the status of subject relative *who* across an urban-rural spread of varieties of English in a settler-colonial context (Denis & D'Arcy, 2018) such as those of Ontario?

## 2. Situating Canadian English

Canadian English is far younger than any UK dialect. While Anglo-America was settled by Europeans comparatively early, Canadian English bears substantial influence from later waves of migration, especially the United Empire Loyalists, who fled the Thirteen Colonies in the wake of the American Revolution, and ensuing waves of migrants to Canada from the United Kingdom and

elsewhere well into the nineteenth century (Chambers, 1986; Walker, 2015: Chapter 3).

Present-day Canadian English is widely cited as being homogenous, at least among urban and middle-class speakers (Chambers, 1986; 2010:19–20; Labov, Ash & Boberg, 2006; Priestly, 1951: 75–76), and rarely straying from a standard core (Chambers, 2004:233). However, many smaller communities outside of cities had a distinct settlement history such that Irish, Scots, and Northern English settlers made up a strong majority of the early populations, such as Newfoundland (Clarke, 1997, 2010), the Ottawa Valley (Pringle & Padolsky, 1981, 1983), and Cape Breton Island (Gardner, 2013). While the settlers of southern areas of Ontario were mostly Loyalists (e.g., Walker, 2015), regions to the north were more of a mix in terms of early European settlement (see Abel, 2006) and, until the late twentieth century, had not been the subject of linguistic scrutiny.

Recent research in Ontario has discovered that many linguistic features are regionally differentiated in a meaningful way (e.g., Tagliamonte, 2014). If Canadian English is indeed unusually homogeneous and/or standardized, then rates of the subject relativizer *who* may be largely comparable across different parts of English-speaking Canada. However, the findings of Levey & Hill (2013) hint that the proportion of *who* is quite different in communities outside of urban centers. What is not known is, with small enough towns far enough from Toronto, whether rates of *wh-* relativizers ever drop as low as they do in far-flung hamlets of the UK (Tagliamonte, Smith & Lawrence, 2005a). For all these reasons, these unexplored possibilities make subject-relative *who* in Ontario an ideal case study of social and geographic differentiation. Given the typical behavior of relative *who* as a prestige form, this feature also offers an excellent testing ground for how long-term changes from above evolve in transplanted regional and social ecologies such as settler-colonial Canada.

## 3. Background

### 3.1 Relative clause markers

The foundational restrictive relativize clause markers in English are *that* and zero (Dekeyser, 1984; Traugott, 1972). The *wh-* variants were grafted onto the extant system in a prototypical case of change from above (Ball, 1996:248, 213; Nevalainen & Raumolin-Brunberg, 2002:120). Early attestations of the *wh-* forms are limited to formal written styles and/or environments with complex syntax (Dekeyser, 1984:76; Jones, 1972:140; Nevalainen & Raumolin-Brunberg, 2002; Tagliamonte et al., 2005b:93–94). The first generations of *wh-* users were authors of fiction who were likely inspired by French and/or Latin, prestigious languages of scholarship that have interrogative particles able to serve as relativizers (Mustanoja, 1960:199–200; Rydén, 1983:133; Tottie & Rey, 1997:84).

The relativizer *who* apparently lagged behind the other *wh-* forms in this context, such as *which*, but is attested in English from the fifteenth century onwards (Montgomery, 1989:127–8; Romaine, 1983:223; Rydén, 1983). In the late seventeenth century, *that* "shifted away from personal subjects, *wh-* and zero expanded to take its place" (Ball, 1996:2467). The two forms *who* and *which* eventually developed specialized functions, [±human] (Ball, 1996:246), and, by the eighteenth century, human subject relativization in British writing was almost categorically represented by *who* (Ball, 1996:249).

In contemporary spoken English, the use of subject relative *who* is common in urban dialects (Cheshire et al., 2013; D'Arcy & Tagliamonte, 2010; Levey, 2006; Quirk, 1957) but is highly determined by broad social factors such as class (Macaulay, 1991:65), education (Tagliamonte, 2002:161), the interaction of gender and education (D'Arcy & Tagliamonte, 2010:396–7), and upward social aspirations (Tagliamonte et al., 2005b:107n18). In this way, relative *who* continues to correlate with elements of prestige, even centuries after its introduction into English.

The extent to which the relativizer *who* is found in rural or non-standard dialects has been less well-studied (Ball, 1996:239; Bayley, 1999:115; Tottie & Rey, 1997:219). In North American dialects of English, rates of *who* are either low or zero in Appalachia (Ball, 1996; Hackenberg, 1972), Oklahoma (Berni, 1995, as cited by Bayley, 1999:118), Mexican American English in Texas (Bayley, 1999), and African American Vernacular English of both the past and the present (McKay, 1969; Tottie & Harvie, 2000; Tottie & Rey, 1997). In the United Kingdom, dialects diverge in terms of both the proportions of the relativizers and the inventory of variants (Ball, 1996; Cheshire et al., 2013; Levey, 2006).[1] In the UK, several studies also suggest a north/south split in relativization strategies (Jones, 1972:140; Nevalainen & Raumolin-Brunberg, 2002:1112; Tagliamonte, 2002; Van den Eynden, 1993), with people in southern Britain having more *wh-* and those in the north more *that* and sometimes *at* (Beal & Corrigan, 2005; Jones, 1972).[2] The key factor appears to be distance from large cities. Small rural towns in the south of England are not so different from those in the north in terms of relativization (Tagliamonte, 2013:103), and proportions of *who* in the northern city of York are higher than expected from its location alone (Tagliamonte, 2002:161).[3] Rather than absolute size, "it is relative proximity of the dialects to mainstream norms that matters" (Tagliamonte, 2013:103) in terms of how much representation there is of *who* among the relativizers. Tagliamonte (2013:105) argues that in remote, small, rural communities in the UK, *who* and other *wh-* relativizers are "an overlay from outside the variable grammar." Consistent with earlier findings (Romaine, 1982:222), the *wh-* forms simply never spread to these locations from the geographic and social epicenter where it arose, that is, London (Tagliamonte et al., 2005b:94).

In Canadian English, there are signs of urban-rural differences in terms of relativizer behavior. In Toronto, *who* represents 31.2% of subject relativizers (D'Arcy & Tagliamonte, 2010:391). In Oshawa-Whitby, on the outskirts of the city, Levey and Hill (2013:48) find 23.4%. While a necessary caveat is that the data these studies were based on were collected by independent researchers, the difference in terms of the number of tokens of *who* and *that* in Toronto versus Oshawa-Whitby is highly significant (Pearson's $\chi2$: $p < 0.001$, df = 1, N = 2228).

Given that this variable remains sensitive to prestige even centuries after its emergence, our central research question is the status of subject relativizers in a cross-section of outlying communities in English-speaking Ontario. Is *who* arrayed across the landscape in an interpretable way, as in the UK?

### 3.2 Models of diffusion

In terms of linguistic diffusion, the Canadian situation cannot, of course, be taken as a mirror of the UK situation, where *who* was a fully innovative form at the point of actuation centuries ago. However, Toronto is the cultural and economic core of the province and thus can be taken as the epicenter for linguistic prestige. If relative *who* is still in the process of infiltrating restrictive subject relatives clauses in Ontario, it may pattern in accordance with one of several models of diffusion (see Britain, 2013).[4] A *wave model*

(Bailey, 1973) predicts that the proportion of an innovation—in this case, relativizer *who*—is correlated with geographic distance from its point of origin, as per ripples in a pond. A *cascade model* or *hierarchical model* (Chambers & Trudgill, 1998:192; Hernández-Campoy, 2003; Labov, 2003:192) rests primarily on community population size, with innovations spreading from large cities to medium-sized ones, then to the smallest, with less regard for absolute distance. Taking both distance and population size into account yields a *gravity model* (Chambers & Trudgill, 1998: Chapter 11; Trudgill, 1974).

Changes in progress may behave differently in terms of which of these models is the closest match (Bailey et al., 1993; Britain, 2013; Labov, 2003). As a result, our developing understanding of the geographic behavior of changes in progress will eventually depend on studies of a large assortment of innovations from different levels of the grammar (e.g., Maegaard et al., 2013), different levels of salience, etc. Vernacular speech corpora that encompass communities with a range of distances and a range of settlement sizes, where these factors are not collinear, are the key to disentangling the respective influences of distance and population size.

## 4. Methodology

### 4.1 Data

This study draws on the Ontario Dialects Project (ODP) (Tagliamonte, 2003–2006: et seq.) as of April 2018. At that point, the corpus comprised approximately ten million words composed of sociolinguistic interviews (Labov, 1984) conducted with individuals born and raised in various towns in Ontario. We target ten communities, shown in Table 1, as shown on Map 1. The speaker sample is stratified by age, gender, education level, and occupation. Crucially, the locations vary in terms of both population size and isolation vis-à-vis Toronto without these dimensions being conflated. A Spearman's correlation test between these measures reveals a coefficient of 0.16, which is close to neutral (the reference range being −1 for a perfect negative correlation and +1 for a perfect positive one).

Belleville is a medium-sized, predominantly white-collar town to the east of Toronto along Highway 401 and the northern shores of Lake Ontario. The settlement history overlaps with that of Toronto in that the founders were mostly Loyalists (Boyce, 1967). Almonte is a small town located in the Ottawa Valley at the eastern extent of the province of Ontario. It is well known to be an enclave of conservative dialect features due to its distinctive Irish heritage (Jankowski & Tagliamonte, 2017; Pringle & Padolsky, 1981, 1983). Beaverton, Burnt River, Haliburton, and Lakefield are small towns lying off the major highways (e.g., Highways 401 and 400 and 11) that extend eastward and northward from Toronto. North Bay, Temiskaming Shores, Kirkland Lake, and Timmins/South Porcupine are all located along Highway 11, the main north-south corridor that splits Ontario into eastern and western regions.

As noted, the historical settlement of areas north of Toronto differed from that of the southern areas of the province around Lake Ontario and Lake Erie in multiple respects (Tagliamonte, 2014). While southern Ontario was populated mainly by United Empire Loyalists fleeing the United States in the wake of the American Revolution, the north was settled around small, dispersed towns that sprang up around natural resources (lumber, paper, mining, etc.). The population in these areas was multicultural from the beginning and represented several different socioeconomic strata (e.g., Tagliamonte, 2014:204, 214–15). Moreover, the more northerly regions have "a strong and distinct northern identity" (Tagliamonte,

**Table 1.** Communities in Ontario with distances from Toronto (Google Maps 2017–2018) and populations.
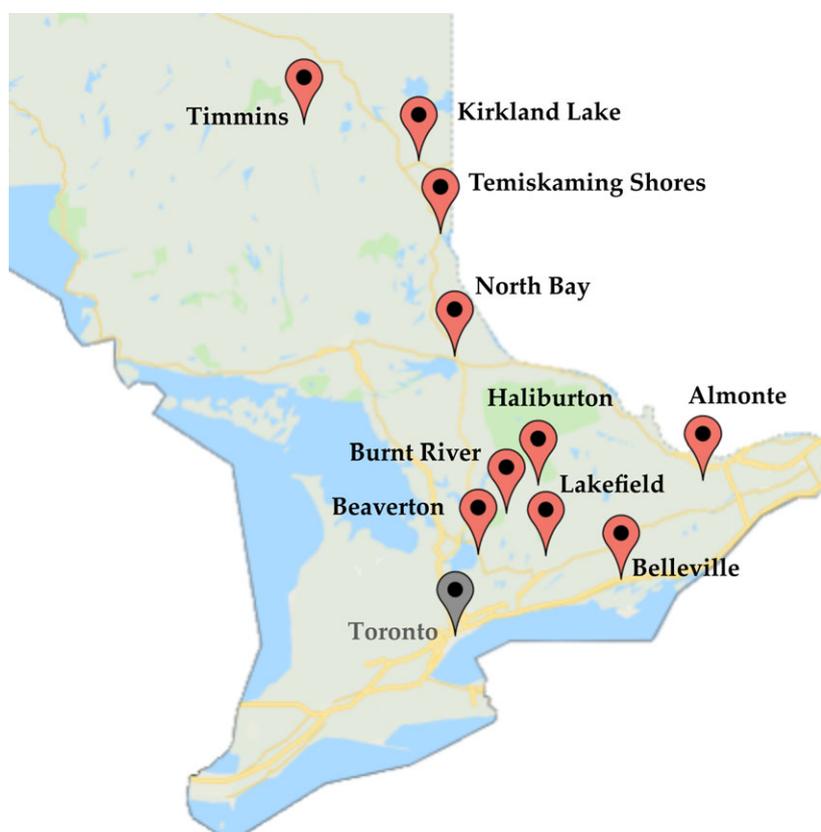
|  | Road distance from Toronto[15] | Population |
|---|---|---|
| Beaverton | 110 km/68 miles | 2,822 |
| Lakefield | 156 km/97 miles | 2,753 |
| Burnt River | 166 km/103 miles | < 300 |
| Belleville | 188 km/117 miles | 50,716 |
| Haliburton | 216 km/134 miles | 1,149 |
| North Bay | 345 km/214 miles | 50,396 |
| Almonte | 371 km/231 miles | 5,039 |
| Temiskaming Shores | 497 km/309 miles | 9,920 |
| Kirkland Lake | 586 km/364 miles | 6,305 |
| Timmins/South Porcupine | 697 km/433 miles | 29,331 |

2014:204; Zaslow, 1973). In terms of linguistic features examined thus far, there are some similarities across Toronto and the north, but a range of conservative UK features exist in the small towns of Ontario, especially among the older population (Tagliamonte, 2014:215). Even within some phenomena that north and south share, there are sometimes subtle differences in rates and usage: such as the *be like* quotative (Tagliamonte, 2014:226–7), the difference between supper and dinner for the evening meal (Jankowski & Tagliamonte, 2019), the use of certain swear words (Tagliamonte & Jankowski, 2019), and discourse-pragmatic uses of *there/here* (Tagliamonte & Jankowski, 2020).

### 4.2 Extraction and coding

All restrictive subject relative clauses were extracted and coded following the protocol detailed in an earlier study of Toronto (D'Arcy & Tagliamonte, 2010). This, in turn, was adapted from that of Tagliamonte et al. (2005b) and Tagliamonte (2002) following Tottie and Harvie (2000). Adverbial relatives (*when, where, why*, etc.) were excluded for being syntactically and semantically divergent (Levey, 2006:54; Tagliamonte, 2002:152). A necessary caveat is that even when nonrestrictive relative clauses are excluded (Ball, 1996:228–9; Tagliamonte et al., 2005b:85), relativizers are a syntactically partitioned system. Relativizers with subject gaps diverge so much from those with object gaps that these contexts need to be considered separately (D'Arcy & Tagliamonte, 2010; D'Arcy & Tagliamonte, 2015). In Toronto, relative *who* is seldom found beyond subject gaps (D'Arcy & Tagliamonte, 2010:391), and the object relativization system consists largely of stable variation between *that* and zero (D'Arcy & Tagliamonte, 2010:393). For these reasons, we consider only restrictive relativizers with subject gaps.

As with Tagliamonte et al. (2005b), we include cleft (2a), possessive (2b), and existential (2c) structures (see also Ball, 1996:257), on the basis of two of their properties. One is that they are not different enough from canonical relative clauses to warrant omission (Ball, 1994:196; Ball, 1996:236). The other is that they are fairly infrequent and so are unlikely to overwhelm the canonical relative clauses in terms of number and/or patterning. The envelope of variation is thus defined as a relativized subject regardless of the syntactic context preceding the head NP. AntConc (Anthony, 2019) was used to search for the strings "that," "who," and "which,"

**Map 1.** Ontario communities (Google Maps, 2018).

and then the output was manually sorted to identify restrictive relative clauses.[5]

(2a) So it was two forty-five-gallon *drums* THAT had to be filled every day for them pigs.
(Rachel Moyles, F 76, Almonte)
(2b) I had a *boarder* one time THAT had a- a two-seater plane.
(Celine Yates, F 75, Kirkland Lake)
(2c) There is still *people* WHO work hard, but in proportion. (Luciano Bananno, M 83, Timmins/South Porcupine)

The zero-subject relativizer[6] is uncommon in most dialects (Bayley, 1999: 134; Guy & Bayley, 1995:155; Levey, 2006:59; Sigley, 1997) and is often considered nonstandard or stigmatized (Beal & Corrigan, 2005; Beal & Corrigan, 2000:15; Cheshire et al., 2013:58; D'Arcy & Tagliamonte, 2010:392).[7] In Toronto, this variant is both unusual and declining in apparent time (D'Arcy & Tagliamonte, 2010:393; Levey & Hill, 2013:48-49). However, zero-subject relativizers have often been found at higher rates in rural/working-class varieties than in those of normative urban dialects (e.g., Bayley, 1999:118; Britain, 2008; Clarke, 2004; Comrie, 1999:83; Hackenberg, 1972:114; Henry, 1995: Chapter 6; Macaulay, 1991; Quirk, 1957; Tagliamonte, 2013:102; Wolfram & Christian, 1976:120–21). As could be expected for a nonstandard form, the zero-subject relativizer also appears more in speech than in writing (Hinrichs, Szmrecsanyi & Bohmann, 2015:808n2; Levey, 2006:51–52; Sigley, 1997:224). Given the potential importance of zero-subject relativizers in Ontario, we were interested in taking these into account.

Zero variants of any morphosyntactic variable are difficult to find with efficiency or automaticity.[8] To find a baseline for the syntactic distribution of the zero-subject relativizers, we manually read through the text files of one of the community samples of the ODP

(Belleville) in order to find the zeros (N = 40). Table 2 shows that, as with earlier analyses (e.g., Doherty, 2000), a majority of the zero-subject relativizers (N = 27, or 67.5%) are found in an existential or possessive construction. Therefore, we used AntConc (Anthony, 2019) to find all of the constructions in Table 2 and manually examined them to find zero-subject relativizers. We estimate that this procedure has located about two-thirds of the zeros in the corpus.

We exclude proper names, relative adverbials, atypical gapless relative clauses, ambiguities, WHIZ deletion, fossilized phrases, etc. (Tagliamonte et al., 2005b:85–86). We also disregard *whose*, the possessive *thats* (McDaniel et al., 2002; Seppänen & Kjellmer, 1995), and doubly filled heads such as *that who* or *who that* introducing a restrictive relative clause.

Each token was coded for animacy of the head NP, as per five categories based on those of Tagliamonte et al. (2005a:91) and D'Arcy and Tagliamonte (2010): things and other inanimate nominals; small numbers of individual humans; the word *people*; collectives (including groups and indefinite pronouns); and animals.[9]

This accounts for the two major linguistic factors that have consistently been found to affect English relativizer variation in prior studies (see Tagliamonte et al., 2005b:87). We have controlled for syntactic role by restricting the sample to subject gaps only and coding for animacy. Beyond those, there are several minor linguistic factors that are also recognized as playing a role in restrictive relative clause variation, including the type of construction (Ball, 1996:235; Tagliamonte et al., 2005b:96), length of clause (Cofer, 1975:31; Sigley, 1997:214; Tagliamonte et al., 2005b:97), adjacency of head NP and relative clause (Guy & Bayley, 1995:150; Montgomery, 1989:130–31; Sigley, 1997:214; Tagliamonte et al., 2005b:98), definiteness of head NP (Tagliamonte et al., 2005b:98; Tottie, 1997:233), and more (Cheshire et al., 2013:62; Hinrichs

**Table 2.** Contexts of the zero-subject relativizer in Belleville.

| Collocation | N |
| --- | --- |
| there was/were | 9 |
| there is/are/'s | 8 |
| it was | 5 |
| I have | 2 |
| that was | 2 |
| there used to | 1 |

**Table 3.** Proportions and total number of subject relativizers in each Ontario community. Values for Toronto are from D'Arcy and Tagliamonte (2010:392).

|  | *that* | *which* | *who* | *zero* | Total N |
| --- | --- | --- | --- | --- | --- |
| **Toronto** | 65.0% | 3.6% | 31.2% | 0.3% | 1675 |
| **Almonte** | 70.9% | 2.3% | 10.9% | 16.0% | 570 |
| **Beaverton** | 73.6% | 2.2% | 17.3% | 6.9% | 626 |
| **Belleville** | 66.6% | 2.9% | 27.4% | 3.1% | 817 |
| **Burnt River** | 78.1% | 2.4% | 13.2% | 6.3% | 333 |
| **Haliburton** | 81.9% | 1.6% | 10.2% | 6.4% | 580 |
| **Kirkland Lake** | 70.1% | 1.7% | 25.3% | 2.9% | 1587 |
| **Lakefield** | 69.8% | 1.0% | 26.6% | 2.5% | 199 |
| **North Bay** | 69.4% | 2.1% | 26.2% | 2.3% | 827 |
| **Temiskaming Shores** | 69.8% | 1.7% | 25.1% | 3.3% | 1261 |
| **Timmins/South Porcupine** | 70.8% | 0.1% | 26.9% | 2.1% | 699 |

et al., 2015:816–819). However, as with D'Arcy and Tagliamonte (2010), we focus on social factors that govern the use of the relativizers. Paramount in our study are the roles of population size, distance from Toronto, and whether these elements correlate with the use of *who*.

Subject to these restrictions, the data comprise over 7,000 restrictive relative clauses with subject gaps from the ODP, from a total of 347 speakers.[10]

## 5. Results and discussion

### 5.1 Geographic distribution of variants

Table 3 and Figure 1 display the proportion of each subject relativizer for each of the ten communities in Ontario targeted for this study compared to the proportions for subject relativizers in Toronto. Appendix A has the proportions and total number by community.

Figure 1 shows that the proportion of *who* (the light gray bars) is higher in Toronto (31.2%) than it is in any of the ten towns in the hinterland. The proportion of relative *who* in these communities spans a range from a high of 27% in Timmins/South Porcupine to a mere 10% in Haliburton and Almonte.

The communities are also distinguished by the relative proportions of the other relativizers: *which, that,* and zero. Timmins/South Porcupine patterns with Toronto. The three other towns along Highway 11, between Toronto and Timmins/South Porcupine (North Bay, Temiskaming Shores, Kirkland Lake), have a slightly lower proportion of *who*, but what sets them apart from Toronto and Timmins/South Porcupine is their use of *which*. Belleville has greater use of relativizer *which* than in any of the other places.[11] Almonte stands out for a different reason: the proportion of the zero-subject relativizer is the highest of all the communities. However, those interviewed in Almonte were all older speakers, likely explaining this heightened rate of zero. The other small towns—Lakefield, Beaverton, Burnt River, and Haliburton—also have a healthy representation of relative zero and comparatively low rates of *who*.

To confirm commonalities across communities, we use a conditional inference tree analysis (Baayen, 2009; Hothorn, Hornik, & Zeileis, 2006; Tagliamonte, 2012: Chapter 5; Tagliamonte & Baayen, 2012). This procedure, which operates iteratively within subsets, exposes divisions corresponding to statistically significant differences. Figure 2 shows a conditional inference tree created in R 3.6.3 (R Core Team, 2020) with the *party* package (Hothorn et al., 2006), using subject relativizers as the dependent variable and community as an independent factor.

Figure 2 shows divisions at nodes 1, 3, 4, and 7. The first community to split off from the rest is Almonte. As is visible here and in

Figure 1, this community has a distinctively high rate of the zero-subject relativizer and is the only place in the current study where there is more zero than *who*. The analysis identifies another regional set at node 3, which splits off the other small towns (consisting of Burnt River, Beaverton, and Haliburton) versus mid-size cities both north and south: Timmins/South Porcupine, Kirkland Lake, Temiskasming Shores, North Bay, and Lakefield. The proportion of *who* is lower in these small towns, with a subject relativizer system dominated by *that*. At the third level of division at node 4, the tree distinguishes Burnt River and Beaverton from Haliburton. At node 7, Belleville separates from the rest, possibly due to its higher rate of *which*. The position of Lakefield is curious; however, there are only 199 tokens of relativizers (as per Appendix A). Given that it is also geographically distant from the northerly towns (see Map 1), for the sake of regional grouping we reassign it to the node with Belleville, to which it is proximate. The four Highway 11 towns we henceforth refer to as the "northern towns," Haliburton, Beaverton, and Burnt River are the "small towns," and Belleville and Lakefield represent the "southeast."

Figure 3 shows the distribution of relativizers in these four regions. The southeast and the northern towns pattern together in terms of their proportion of *who*; Almonte is *sui generis*, as noted. The key pattern of differentiation is, on one hand, the small towns (Beaverton, Burnt River, and Haliburton) as well as Almonte, and, on the other hand, the northern towns and the southeast, where the proportion of *who* is comparably higher. These regional differences point to a role for population size and local connectivity rather than raw distance as an explanatory factor in the use of relative *who* in Ontario English. Indeed, a Spearman's correlation test in Microsoft Excel 2016 between the proportions of *who* across these eleven sites and distance from Toronto (see Map 1) show only moderately positive correlation (0.53). A similar test with the proportions and settlement population size is stronger (0.65).

### 5.2 Apparent time

D'Arcy and Tagliamonte (2010:394) reported a classic inverted-V shaped trajectory in apparent time of subject relative *who* in
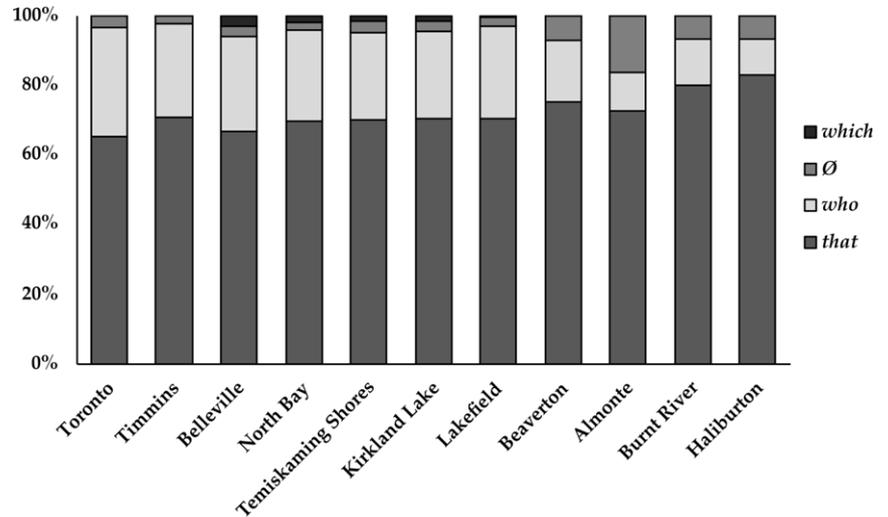
**Figure 1.** Subject relativizers as percentage of the total subject relatives in 10 Ontario communities. Values for Toronto are from D'Arcy and Tagliamonte (2010:392).
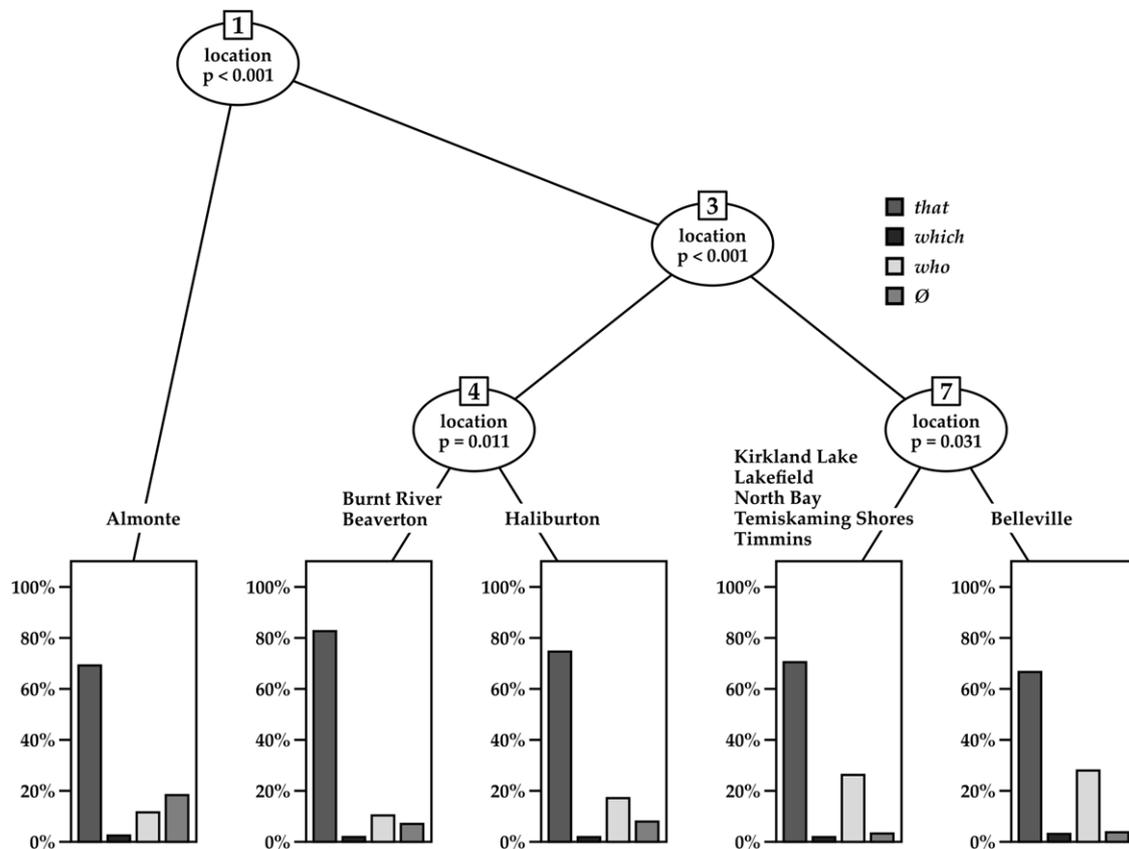


**Figure 2.** Conditional inference tree (Hothorn et al., 2006) conducted in R 3.6.3 (R Core Team, 2020).

Toronto, the reflex of an age-graded variant (Downes, 1998; Holmes, 1992; Labov, 1994:73). This pattern suggests that the subject relativizer system of the city is stable over time with individuals changing their use as they age, but the community, in general, stays the same as time goes by. A first step in assessing this possibility for the current data is to visualize the variation among subject relativizers in apparent time (i.e., by decade of birth), in Figure 5.

The results primarily indicate stability. The proportions of *who* and *that* are steady for most of the twentieth century, but it is worth noting that plotting the full range of the scale visually highlights the

low frequency of *who*. Both *which* and zero are rare from the earliest decades of the twentieth century and show a visible downward trend. Notably, among speakers born after 1980, the proportion of *who* increases and *that* decreases.

The stability of these relativizers in apparent time can be interpreted in terms of what Labov (2007) refers to as *transmission*: when there is parallel frequency of forms across generations and locations. While this view of the data obscures the regional patterning that we have already identified, this finding suggests that the English-speaking settlers brought *who*-relativization
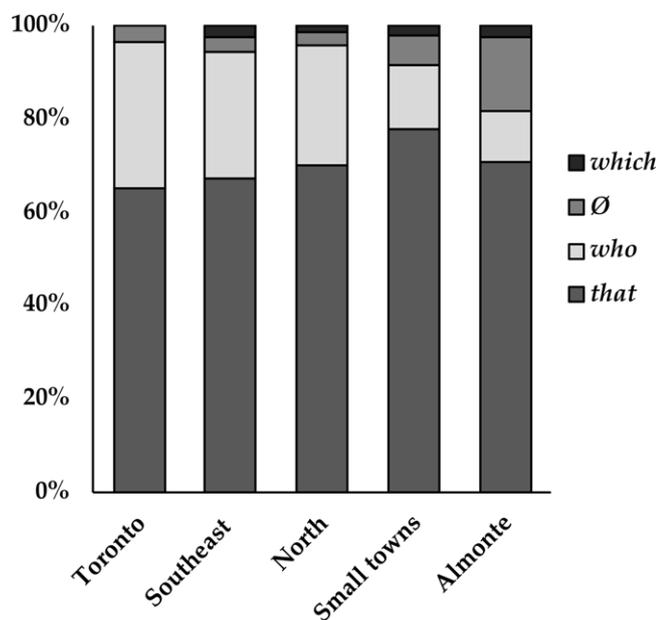
**Figure 3.** Subject relativizers as percentage of the total subject relatives in five regions of Ontario. Values for Toronto are from D'Arcy and Tagliamonte (2010:392).

with them—as per the *founder principle* of Mufwene (1996)—and that the system has remained essentially stable since that time. However, given the rise of *who* in the youngest speakers, *diffusion* (Labov, 2007) must also be involved with this variation. *Who* as a relativizer, as noted, came about as a change from above and continues to have prestigious connotations in urban English-speaking populations in several countries. If diffusion is indeed involved, we might expect linguistic change in progress such that women lead change toward the more prestigious form, as per Labov's Principle 3 (2001:274). Figure 6 tests this possibility by showing subject relative *who* by speaker gender.[12]

Figure 6 offers several important findings. First, beginning with individuals born in the 1960s, women start to break away from the men by using more *who*. Second, in both gender groups, there is an evident change in progress beginning in speakers in the 1980s. These results support the interpretation of a change from above (Labov, 2001:274). The Toronto data also showed that women used more *who* than men, but especially within a restricted group of more educated speakers. D'Arcy and Tagliamonte (2010:397) argued that the female lead went hand-in-hand with stability (i.e. Labov's Principle 2 [2001:266]) and that the heightened use of relative *who* in female to female speech was a synchronic reflex of social meaning from the old prestige associated with the *wh-* relativizers. The new findings presented here from northern cities and rural small towns of Ontario show stability as in the city and are also consistent with an interpretation of enduring prestige. Unlike in Toronto, however, they reveal a distinct increasing use of *who* in recent decades, especially by women.

Another reasonable hypothesis is that more educated speakers or those with white collar occupations are leading the change toward *who*, as part of a long change from above. Figures 7 and 9 test this possibility by showing the use of *who* by speaker decade of birth and binary level of education (any postsecondary education versus none) and binary occupation (blue-collar versus white-collar).

Figure 7 reveals a nuance to the apparent time trajectory: more educated and less educated speakers diverge. Both groups are stable

in apparent time until the 1970s. Up to that point, educated speakers used more *who* (with the exception of those born in the 1980s). Then, there are two patterns. The less educated speakers have an increased use of *who*, rising to rival the more educated speakers in the 1970s. Thereafter, among those born in the 1980s, both groups show an increase in use of *who*. We will return to interpret these trends below.

Figure 8 reveals that individuals with white collar occupations show a consistent, slightly higher use of relative *who* among the oldest generations, but less so in later decades. Along with the fact that the differences are modest at every point in the trajectory, this suggests that occupation type is comparatively less diagnostic of relative *who* usage.[13]

Strong evidence for diffusion alongside transmission would come from differing frequencies and/or grammatical patterns of the use of *who*, demonstrating contact with or influence from urban (mainstream) norms over time. Was the shift toward more *who* in rural Ontario only the result of social influence, or are there internal mechanisms of this linguistic change? Is there longitudinal transmission of constraints as well as frequency? To address these questions, we consider the remaining linguistic factor: the type of head noun by semantic category.

### 5.3 Semantic class of head noun

Historically, subject relativizer *who* came to favor [+human] subjects (Ball, 1996:246); conversely, *that* became specialized for the opposite, and the zero-subject relativizer was relegated to specific constructions and conservative varieties. As an incoming form in rural Ontario, *who* may be continuing to encroach on human subjects. In this way, semantic class of the head noun may offer further insight into recent stages of this change.

Figure 4 displays the proportions of *who* in Toronto (D'Arcy & Tagliamonte, 2010) and in the four geographic regions outside the city according to four semantic categories of head nouns in the data. This visualization excludes the category of inanimate objects or concepts (things), since those are decidedly nonhuman and thus have near-categorical use of *that* (Ball, 1996:246). Appendix B contains the counts and percentages.

Table 4 and Figure 4 show that animacy of the head NP operates in parallel across Ontario. Each region has the same constraint hierarchy: collectives and animals have the least use of relative *who*, collectives have a little more, and [+human] head nouns and the noun *people* have the most.[14] This stability of the constraint ranking of the semantic class of head noun across locations is consistent with *transmission* of the incoming form in this region. The ODP data show that, with respect to both the internal patterns of the system (the proportions of the variants) and the internal constraints (i.e., [±human]), the subject relativization system has been transmitted faithfully across generations and is (mostly) parallel across communities. However, there is a hint that this system continues to encompass prestige and geographical gradation. In order to test how the different factors operate together, we turn to statistical modeling. This enables us to assess the significance of the factors when treated simultaneously, evaluate interactions, and treat the many individuals in the sample as random.

### 5.4 Statistical modeling

As per D'Arcy and Tagliamonte (2010:401; 2015:273), given the nearly categorical use of *that* with nonhuman head nouns (Bailey & Ross, 1988:131), the model was run on only the [+human] tokens from the ODP data (N = 4356, from 347
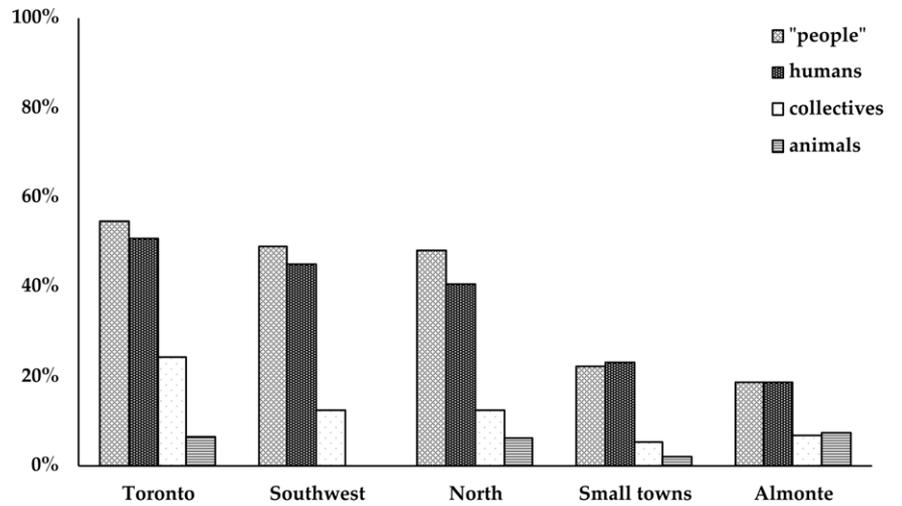
**Figure 4.** Proportions of *who* in five Ontario locations by animacy of the head NP. Values for Toronto are from D'Arcy and Tagliamonte (2010:392).
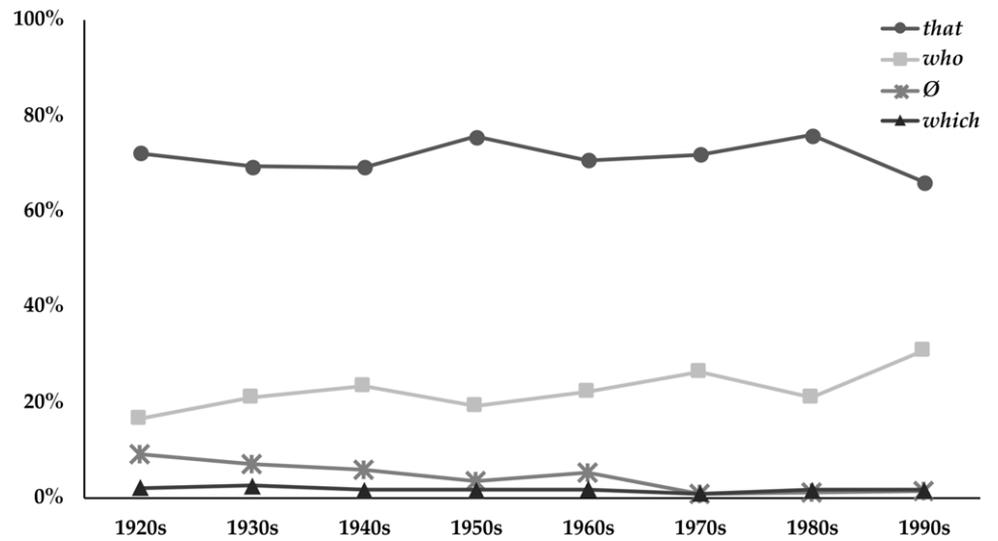


**Figure 5.** Proportion of *who* among subject relativizers in apparent time (i.e., by decade of birth).



**Figure 6.** Proportion of subject relative *who* in apparent time (i.e. by decade of birth) by gender.
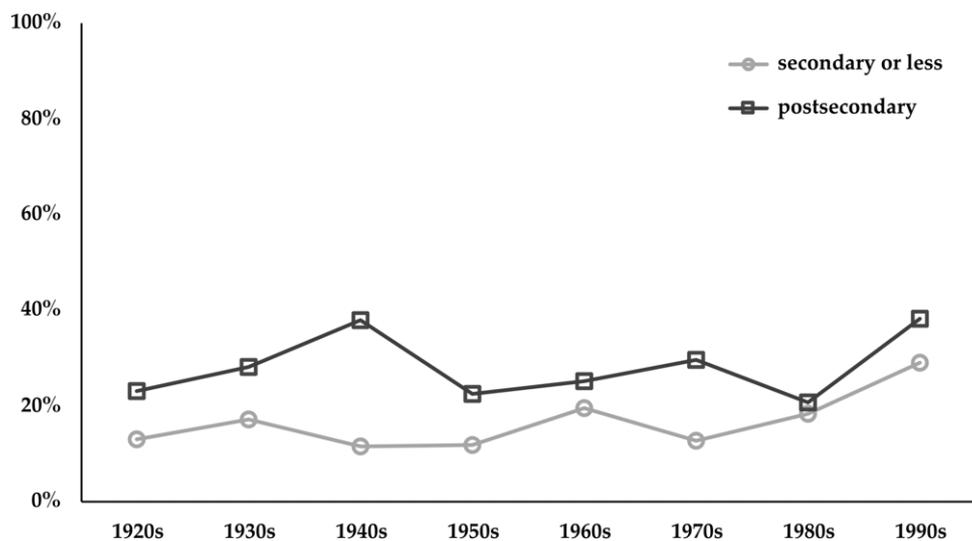
**Figure 7.** Proportion of *who* among subject relativizers in apparent time (i.e., by decade of birth), by education level (more-educated = at least some postsecondary education).



**Figure 8.** Proportion of *who* among subject relativizers in apparent time (i.e., by decade of birth), by occupation (white collar versus blue collar).

individuals), that is excluding animals, collectives, and inanimate objects. From there, all the predictors and their interactions were tested together in R 3.6.3 (R Core Team, 2020) via mixed-effects logistic regression using the *lme4* package (Bates, Maechler & Bolker, 2011) and the *BOBYQA* optimizer (Powell, 2009). The model was gradually refined in order to capture the significant factors. Even with the large token count, modeling date of birth as continuous was untenable, so decade of birth was used instead. Occupation was never selected as significant, so it was removed. The results are shown in Table 5.

Each of these independent factors—region, decade of birth, gender, and level of education—contributes explanatory value due to encompassing one or more significant differences. In terms of region, the northern towns and the southeast both contain significantly more *who* than the small towns do: the effect size is both larger (higher absolute value of the estimate) and more highly significant (lower *p* value) for the southeast. In terms of decade of birth, against the reference value of the 1910s, the only decade with a proportion of *who* that differs significantly is the 1990s: the youngest people in the corpus use significantly more *who* than the oldest people, while none of the other decades is statistically distinguishable from the people born in the 1910s. The possibility

of age-grading away from the standard in young adulthood, *who*, cannot be ruled out; Brook et al. (2018) found this in a panel study of a young woman in Toronto. However, the sex effect and educational effect suggest a role for change in progress with an acceleration occurring recently in apparent time. The sex effect reaches significance such that men use less *who* than women, and the educational effect is highly significant: people with more education in rural Ontario use more *who*. The social factors point to change from above in progress, and the regional patterning indicates the key role of region and population size.

## 6. Conclusion

We began our study by asking how subject relative *who*—a long-term change from above—would operate in a settler-colonial ecology where considerable migration occurred from the early to late nineteenth century, and to what extent this variant would be geographically variegated in a region as expansive as Ontario. We focused on speakers born and raised in communities that have an assortment of sizes, ancestral settler roots, relative isolation, and distance from the major urban center of the province (Toronto). We discovered that the situation in Ontario, with

**Table 4.** Proportions of *who* in five Ontario locations by animacy of the head NP. Values for Toronto are from D'Arcy and Tagliamonte ([2010](#):392).

|  | Toronto | southeast | northern | small towns | Almonte |
|---|---|---|---|---|---|
| "people" | 54.6% | 48.9% | 48.1% | 22.2% | 18.5% |
| humans | 50.8% | 45.0% | 40.7% | 23.2% | 18.8% |
| collectives | 24.3% | 12.3% | 12.3% | 5.2% | 6.7% |
| animals | 6.5% | 0.0% | 6.2% | 2.0% | 7.4% |
| things | 0.0% | 0.0% | 0.1% | 0.0% | 0.0% |
| **Total N** | **1675** | **1016** | **4374** | **1539** | **570** |

**Table 5.** Mixed-effects logistic regression on the likelihood of *who* as a relativizer (versus all of the alternatives together) for tokens with [+human] head nouns.

|  | Estimate | Std. error | z value | p value |  | % *who* | Total N |
|---|---|---|---|---|---|---|---|
| (Intercept) | -1.05290 | 0.69385 | -1.517 | 0.129146 |  | n/a |  |
| **Community** small towns | reference value |  |  |  |  | 21.9% | 1207 |
| northern towns | 0.60351 | 0.20877 | 2.891 | 0.003843 | ** | 42.5% | 2562 |
| southeast | 0.95264 | 0.28276 | 3.369 | 0.000754 | *** | 45.8% | 587 |
| **Decade of birth** 1910s | reference value |  |  |  |  | 28.7% | 94 |
| 1920s | 0.10376 | 0.71016 | 0.146 | 0.883840 |  | 27.1% | 602 |
| 1930s | 0.38229 | 0.70322 | 0.544 | 0.586695 |  | 33.9% | 749 |
| 1940s | 0.42468 | 0.71565 | 0.593 | 0.552902 |  | 40.3% | 496 |
| 1950s | 0.07800 | 0.71669 | 0.109 | 0.913332 |  | 34.4% | 585 |
| 1960s | 0.39757 | 0.72874 | 0.546 | 0.585363 |  | 37.9% | 377 |
| 1970s | 0.24681 | 0.73926 | 0.334 | 0.738482 |  | 42.3% | 336 |
| 1980s | 0.01406 | 0.72060 | 0.020 | 0.984431 |  | 35.1% | 487 |
| 1990s | 1.55476 | 0.71257 | 2.182 | 0.029117 | * | 50.8% | 630 |
| **Gender** female | reference value |  |  |  |  | 40.5% | 2244 |
| male | -0.41093 | 0.17104 | -2.402 | 0.016285 | * | 33.8% | 2112 |
| **Education** more education | reference value |  |  |  |  | 44.6% | 2115 |
| less education | -0.88155 | 0.19283 | -4.572 | 4.84e-06 | *** | 30.2% | 2241 |
| **Random effect:** individual | variance: 1.717 std. dev.: 1.31 |  |  |  |  | n/a |  |

British-majority founders up to the mid-nineteenth century, pre-serves a trace of the conservative vernacular system of the English relativizer system at earlier stages in the UK. The contemporary geographic patterning of variants in Ontario illuminates a change from above as it spreads through about one hundred years of time and space.

First, subject relative *who* is found at varying proportions across Ontario communities. These range from a low of 10%, nearing the low rates found in rural UK communities in the late twentieth century (Tagliamonte et al., [2005](#)b) to 27%, almost a full third of subject relative clauses. The communities with the highest proportion of *who*, Belleville and Timmins/South Porcupine, have virtually the same amount of this variant as Toronto does (D'Arcy & Tagliamonte, [2010](#)), but they are neither near each other nor at

similar distances from Toronto. Rather, the proportion of *who* ends up hinging on population size. Timmins/South Porcupine is the most distant place represented in the data examined here, but it has a large size for its remoteness and an airport with flights to Toronto. The other northern towns—Kirkland Lake, Temiskaming Shores, and North Bay—are still more than 300 kilo-meters from Toronto but are much larger in size than the small towns closer to the city (see Table [1](#)) and have fairly high rates of *who*. The places with the substantially lower rates are those that have small population sizes, even if they are nearer to Toronto in terms of raw distance. This is the pattern predicted by the *cascade* or *hierarchical* model of diffusion, which proposes that changes propagate from urban centers outward by targeting the outlying settlements in descending order of population (Labov, [2003](#)).

A striking finding is that on top of broad stability, signs interpretable as change from above are evident in the apparent-time patterning of relative *who* in Ontario. Across all three categories of settlement in the Ontario Dialects Project (the northern towns, the southeast, and the small towns including Almonte), *who* as a relativizer has increased recently in apparent time. While individuals with postsecondary education use more relative *who* consistently from the early decades of the twentieth century (Figure 7), in the later generations, those with less education are catching up and patterning with their stable, more educated counterparts. Further, from the 1960s onward, women use more relative *who* than men (Figure 6). These observations were tested in the statistical modeling, which confirmed the prevailing influence of the educational and gender effects as well as the lag in small communities and the increasing use of *who* toward the end of the twentieth century. We suggest that these temporally specific and socially demarcated developments are the result of external influences. While the jump in the use of *who* by people born in the 1940s may simply be the result of small token numbers in that decade in these data, the trends in the late twentieth century are more substantial and require comment. It is well known that Canadian education has been constantly under reform for more than a century (O'Sullivan, 1999). In the context of broader global changes, Ontario has undergone expansive changes to its curriculum with specific bursts of education reform from the 1960s onward that have led to shifting standards for education and concomitant shifts in social attitudes toward education. One of the outcomes of this is an increasing proportion of the population with higher-level educational attainment, a globally reported trend (e.g., Breen, 2010:367). While detailed analysis of these trends and their impact on linguistic phenomena is beyond the scope of this paper, similar influences on other linguistic variables in Ontario suggest that these broader influences are a topic ripe for further research. For now, what these trends underscore is that change from above is "clearly the result of social factors operating upon language" (Labov, 2010:185). In this case, our findings indicate the extent to which the progression of relative *who* is regulated by geographic influences even several centuries after its onset. In sum, the adoption of relativizer *who* in the English-speaking world is a longitudinal process driven by social pressures, scaffolded by linguistic constraints (in this case, semantic class of head noun) and geography, each influence preserving an imprint of the development even after centuries.

Britain (2013) cautions that different types of variables in different places, situations, and languages might be subject to different forms of diffusion, but this is not the only variable in the Ontario Dialects Project for which Cascade Model patterning has been uncovered. Jankowski and Tagliamonte (2021) found similar results for indefinite pronominal quantifiers in the ODP. For this variable, there is also a change in progress: the quantifiers are increasingly formed with -*one* rather than -*body,* with a strong effect of education underlying the change. Similarly, Franco and Tagliamonte (2021) showed that the lexical item *guy* has increased dramatically in the late twentieth century, with partial Cascade Model effects also driven by speakers with more education. These combined findings suggest that prescriptive norms more generally are implicated in at least some of the linguistic changes in progress in Ontario. However, it is the lingering influence of spatially embedded patterns that leads us to an explanation centered on geography. Even when it comes to a change in progress dating back further than the arrival of European settlers in Ontario, one's place of birth and location in time and space continue to be highly relevant to linguistic variation and change.

## Notes

**1** See also Geisler (2002) for Ulster English.

**2** For two reasons, the situation is complicated by the presence of the nonstandard relativizer *what* in the United Kingdom (Beal & Corrigan, 2005; Levey, 2006:51; Poussa, 1991). First, reports on its distribution do not always match each other; second, it is unclear whether *what* can be considered a *wh-* relativizer as per *who* and *which* (Ball, 1996:240–1; Levey, 2006; Seppänen, 1999; Tagliamonte et al., 2005b:107n17).

**3** However, note a decline in the use of *who* in apparent time in both York (Tagliamonte, 2002:161–2) and London (Cheshire et al., 2013:58–59).

**4** This overview does not include the possibility of occasional rural-to-urban spread, that is, counter-hierarchical diffusion (Bailey et al., 1993; Britain, 2013; Trudgill, 1986).

**5** We also searched for *what* but did not find it used as a restrictive relativizer.

**6** Restrictive relative clauses that have a subject gap and are headed by a zero are sometimes referred to as "subject contact relatives" (see Haegeman et al., 2015).

**7** Quirk, Greenbaum, Leech and Svartvik (1985:865) consider zero-subject relativizers ungrammatical.

**8** However, see Hundt, Denison, and Schneider (2012), and Hinrichs et al. (2015).

**9** Studies of relativizers generally find very few tokens of animals and/or hypothetical nonhuman animates (e.g., Guy & Bayley, 1995:151; Tottie & Rey, 1997:245n12; Cheshire et al., 2013:60n5). The authors of the present study were in the entertaining position of having to come up with animacy values for, among other things: a robot, an extraterrestrial being, an unspecified group of micro-organisms, and multiple sets of zombies. Aside from the aforementioned extraterrestrial ("who was pregnant"), these parahumanoid entities as head nouns in our study all took *that* rather than *who*.

**10** Where quantitative results from Toronto are reported, they are taken from D'Arcy and Tagliamonte (2010:391).

**11** According to Jankowski (2013:69), restrictive *which* is "no longer a productive variant" in Canadian speech in this syntactic context (see also Hinrichs et al., 2015 for American English), but we see that it endures in some of these rural areas. Notably, a nonrestrictive use of *which* is found in rural Ontario even after unequivocally human referents, as for example, "And then I have my brother Dexter, which is thirteen years younger than me" (Vincent Dufresne, M 44, North Bay) or, "So he wrote Melissa Bowen, which was living in Ardmore, Alberta" (Richard Boyd, M 73, Temiskaming Shores). There is historical precedent for the personal *which* from earlier stages before *who* took on its denotation of animacy starting in the seventeenth century (Ball, 1996:246–8; Montgomery, 1989:125; Mustanoja, 1960:195). Such a personal *which* can be found in seventeenth-century American English (Ball, 1996:248; Cheshire et al., 2013:55) and in modern African American Vernacular English (Labov & Cohen, 1967:227).

**12** What we refer to as "gender" here is actually assumed binary gender, based on characteristics of the individual at the time of interview (see Zimman, 2018).

**13** The vast majority of the individuals born after 1990 could not be distinguished on this dimension as most of them were still students at the time of data collection. They have thus been excluded from the figure.

**14** The behavior of the collectives (*family*, *team*, etc.) seems to be distinct in Toronto. The proportion of *who* with collectives never exceeds 13% in the rural areas, whereas in Toronto, a full quarter of the collectives as head nouns have *who* as their relativizer. We leave this observation for future work.

**15** Calculated with Google Maps in July, 2017.

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