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On the genitive's trail: data and method from a sociolinguistic perspective[1]

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Research on the English genitive (e.g. Rosenbach 2007: 154) reports increasing use of the *s*-variant. This has been explained as extension to inanimate possessors, a semantic shift (e.g. Hundt 1998; Rosenbach 2002), or due to the pressures of economy in journalism, a register change (Hinrichs & Szmrecsanyi 2007; Szmrecsanyi & Hinrichs 2008). The present work reports on a large-scale sociolinguistic investigation of the genitive in vernacular Canadian English using socially stratified corpora and individuals of all ages. The results show that human, prototypical possessors are 96 per cent *s*-genitive and non-humans are 95 per cent *of*-genitive. Within the small envelope where both forms are possible, we discover that variation patterns quite differently depending on animacy. For humans, use of the *s*-genitive is stable in apparent time and correlates with whether or not the possessor ends in a sibilant. In contrast, non-human collectives/organizations reveal an increasing use of *s*-genitives in apparent time and a favouring effect of short possessors, persistence (when an *s*-genitive has occurred recently in the previous discourse) and when the individual has a blue-collar job. Groups comprising humans (collectives and organizations), such as *our church's youth group*, and places that are possible locations for humans (countries, cities, etc.), as in *Toronto's best restaurant*, are the prime conduit for this change. These findings from vernacular speech confirm the extension of the *s*-genitive in inanimates by semantic extension.

1 Introduction

Investigation of the genitive alternation (*-s* and *of*) has received considerable attention in historical and contemporary standard varieties of English, for the most part using written data (see e.g. Altenberg 1982; Hinrichs & Szmrecsanyi 2007; Hundt & Szmrecsanyi 2012; Jankowski 2013; Jucker 1993; Leech *et al.* 2009; Ljung 1997; O'Connor *et al.* 2013; Rosenbach 2002, 2003, 2005, 2007, 2008; Szmrecsanyi 2006, 2013; Szmrecsanyi & Hinrichs 2008; Wolk *et al.* 2013; the articles in this volume). The genitive in vernacular speech has received less attention except where the focus is on a comparison to standardized written data.[2] The aim of this article is to explore

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[2] Szmrecsanyi & Hinrichs 2008 analyzed the Corpus of Spoken American English (CSAE) (Du Bois *et al.* 2000, 2003) and the Freiburg English Dialect Corpus (FRED) (Hernández 2006), alongside written data from

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the genitive alternation in vernacular Canadian English, which has not yet received attention for this variable, and to identify whether there are *social* correlates that play a role in the alternation between the two forms. The variation is illustrated in (1)–(3).[3] Examples are from the Toronto English Archive (Tagliamonte 2003–6, 2006, 2008) and the Southeastern Ontario Archive (Tagliamonte 2007–10).[4]

(1) (a) I think she was washing ***the country's*** *clothes* . . . (N/S/49/M)
(b) I know it's still like *the honeymoon capital* ***of the world***. (N/ʃ/32/F)

(2) He was the manager of *the Toyland* ***of the T-Eaton company***, ***the T-Eaton company's*** *Toyland*, and so they were fairly well off . . . (N/Q/72/ F)[5]

2 Background

In order to contextualize the genitive alternation in contemporary English, we first summarize its historical trajectory. The older form is the synthetic Germanic *s*-inflection, which came into competition with the analytic Latinate *of*-genitive construction in Middle English. The *s*-genitive lost ground dramatically to the *of*-genitive as observed in written materials from that time, as illustrated in figure 1.

The *s*-genitive began to increase again by the sixteenth century and has been in competition with the *of*-genitive ever since. During the Middle English period the *s*-form came to be associated with human and other animate possessors, as in (3), and the *of*-form with inanimate possessors, as in (4) (Rosenbach 2002: 180, 190–2; Altenberg 1982: 146–7). This correlation continues in contemporary English (e.g. Ljung 1997: 25; Biber *et al*. 1999: 302–3; Rosenbach 2005: 614, 2008: 152).

(3) (a) Because ***the turtle's*** *face* sort of turns up like a smile. Cute. (b/P/77/F)
(b) Like our parents knew who ***the bigger kid's*** *parent* was. (N/M/82/F)

(4) (a) They just started putting sticks through *the spokes* ***of the bike*** – (I/a/29/F)
(b) It's still like *the honeymoon capital* ***of the world***. (8/N/32/F)

Researchers report that the *s*-genitive has continued to rise in frequency throughout the twentieth century in both American and British English, an increase that is most notable in press registers (e.g. Hinrichs & Szmrecsanyi 2007; Jucker 1993; Leech *et al*. 2009: 222–5; Mair 2006b: 144–8; Rosenbach 2002, Szmrecsanyi & Hinrichs 2008).

the Brown family corpora (Johansson *et al.* 1978; Francis & Kucera 1979; Mair 1997; Hundt *et al.* 1999). Rosenbach's data include spoken portions of the ICE-GB corpus (Nelson *et al.* 2002). Mair 2006b uses the BNC (BNC Consortium 2007; Burnard 2007) in addition to Brown. Börjars *et al.* (2013) contains a detailed multivariate investigation of the genitive alternation in the spoken part of the BNC. The bulk of previous research on the genitives, though, has been restricted to written language, taking comparisons across different written genres as a proxy for differences in formality, and thus ongoing language change.

[3] It is notable that in (2), where both variants are used with the same grammatical context in a single utterance, there is also near-identical intonation for both variants.

[4] Details of these corpora, which serve as the data set for the current study, are discussed in section 3.1.

[5] Codes in parenthesis refer to the community or subcorpus of the Archives (e.g. N, 2, 3, 4, I, b, l, r) followed by a single-digit letter, number or symbol identifying the individual, as well as their age (numeric) and sex (F/M).

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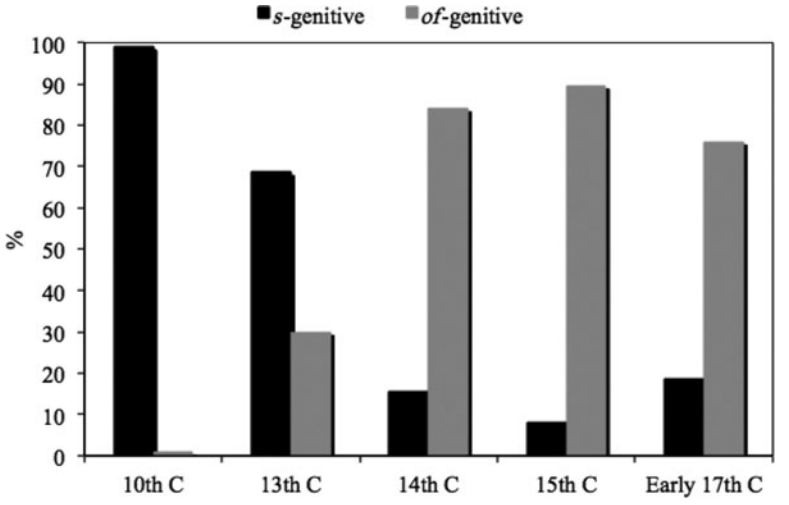


Figure 1. Trajectory of the genitive variants in Early and Middle English (adapted by Rosenbach 2002: 179, 186 from Thomas 1931 and Rosenbach & Vezzosi 2000)

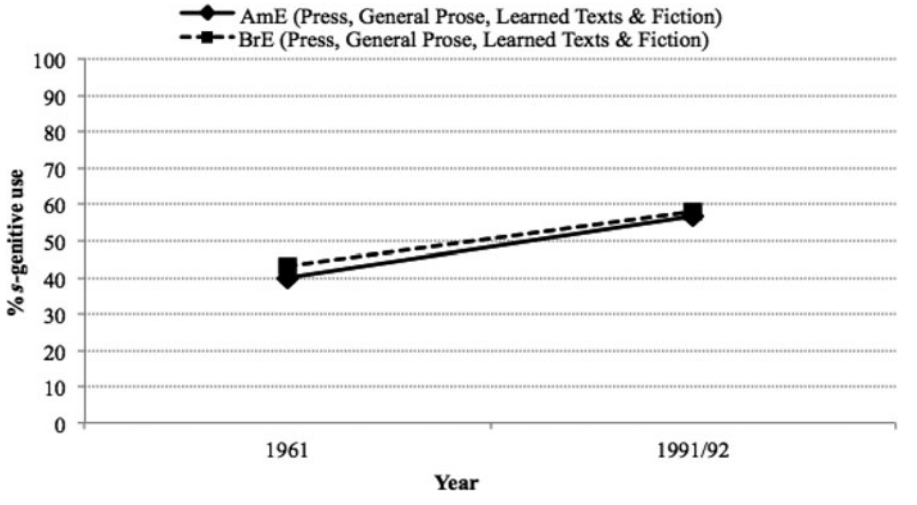


Figure 2. Proportion of *s*-genitive in four American and British English written registers in the late twentieth century (adapted from Leech *et al.* 2009: 225)

One explanation given for this is that the press registers are highly 'innovative' (Hundt & Mair 1999), and further that they are responsive to the pressures of *economy* – the need to fit as much information as possible into a finite amount of text space. Economy is considered to be active in modern journalistic prose (see e.g. Biber 2003: 180) and has been shown to be active for the genitive alternation in particular (Hinrichs & Szmrecsanyi 2007: 441, 457–8, 469; Szmrecsanyi & Hinrichs 2008: 300–1, 307).

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Figure 2 shows the proportion of the *s*-genitive from 1961 to 1991 in four written genres in the Brown family of corpora. This long-term increase in the *s*-genitive has been attributed to its spread into certain subtypes of possessors, particularly those that fall along a point below *human* on an animacy hierarchy such as that in (5), adapted from Zaenen *et al*. (2004: 11):

(5) Human >> other animates (includes organizations, animals, intelligent machines and vehicles) >> inanimates (includes concrete inanimate, non-concrete inanimate, places, time.)

It has been argued that the 'the animacy constraint is currently being loosened for collective nouns, not inanimates . . . ' (Hinrichs & Szmrecsanyi 2007: 440, citing Mair 2006a, 2006b). Rosenbach (2005: 615, 2003: 386) finds that the *s*-genitive is common with certain subsets of inanimate nouns, such as places (geographic locations) and units of time. This highlights the importance of distinguishing subtypes of animates and inanimates, a point to which we will return below.

Jankowski (2013: 73, 101–5) found the overall proportion of *s*-genitives to be increasing across the twentieth century in data from standardized, written contemporary Ontario English, supporting previous findings of continued increase of the form. Figure 3 shows a rise in *s*-genitives in real time over the twentieth century with non-human possessors in written Ontario English text registers, *Maclean's* magazine, and the Federal Hansard, transcripts of the Canadian House of Commons parliamentary debates. This demonstrates that expansion of the *s*-genitive into inanimates is not unique to written language. Although Hansard transcripts are edited so as to make them 'more readable' (Hansard n.d.: 48) and so are not considered to be verbatim, they have their

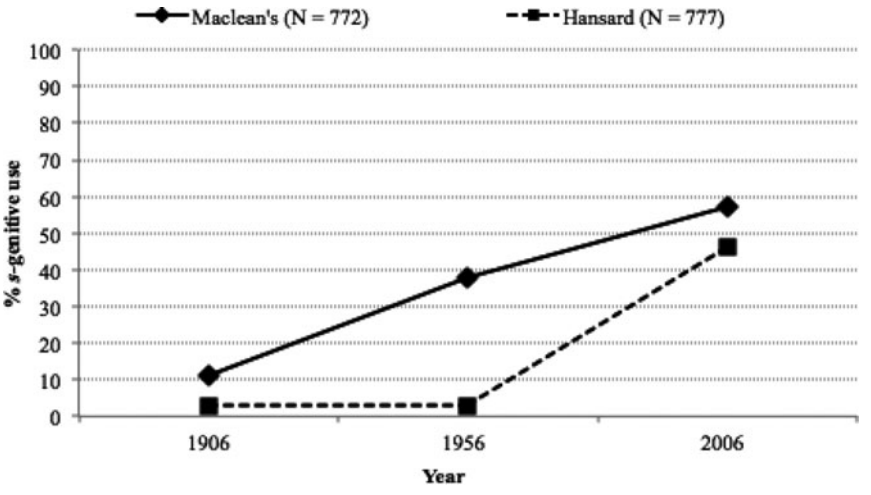


Figure 3. Proportion of *s*-genitive over time with non-human possessors in journalistic prose (*Maclean's* magazine) and parliamentary transcripts (Hansard) in Ontario English (adapted from Jankowski 2013: 102)

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origins in formal spoken language. This result provides further impetus for testing the claims for expansion of the *s*-genitive in vernacular speech.

The *of*-genitive is said to have had formal connotations since at least the seventeenth century. Altenberg (1982: 268–9) describes the *of*-genitive as being 'generally restricted to situations demanding some degree of formality and politeness or when the language is raised to the level of rhetoric'. This suggests that standard sociolinguistic indicators – age, gender, socioeconomic status (as indicated by occupation and education) (e.g. Labov 2002) – may also offer useful insight into the distribution of the forms. For example, linguistic features that are socially evaluated to have higher prestige tend to be reinforced by the educational system (Wolfram 1996: 120–2), leading individuals with more formal education to use the *of*-genitive more than those with less formal education. Those with occupations that require managerial and customer service skills might be expected to use the more formal *of*-genitive at higher rates than those with manual labour jobs, and women might use it more than men (see e.g. Labov 1990, 2001). The *s*-genitive, as the alternative variant, would then be expected to correlate with lower education levels, workers with manual-labour jobs, and men. In the next section, we detail the methodology of our data collection, extraction and coding.

3 Methodology

3.1 Data

Our data are drawn from the Toronto English Archive (TEA) (Tagliamonte 2003–6, 2006, 2008) and the Southeastern Ontario Archive (Tagliamonte 2007–10). These data comprise over 300 individuals and more than 3.3 million words of vernacular speech stratified by age, sex, education, profession and other social factors.[6] The materials were collected using sociolinguistic interviewing techniques designed to elicit casual speech. As the many examples in this article show, the discussions are highly informal, often jocular, with many stories and reminiscences. Individuals range in age from 9 to 92.[7] The sample used for the present study, shown in table 1, is comprised of 191 individuals across this age span and divided between male and female. The location of all the communities on the north shore of Lake Ontario, Ontario, Canada is shown on the map in figure 4. These materials represent Canadian English as spoken in Ontario at the turn of the twenty-first century. We will refer to this variety as Ontario English.

[6] The ~2.5 million word Toronto English Archive was collected between 2002 and 2005 in Toronto, Ontario, the largest urban centre in Canada. The ~1.3 million word Southeastern Ontario Archive, collected between 2007 and 2009, includes data from non-urban communities including the mid-size city of Belleville, Ontario, and the small towns of Lakefield and Burnt River, Ontario. All individuals were born and raised in their respective communities.

[7] In this article, we include only the data from individuals aged 17 and older.

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Table 1. *Sample design by age, corpus and gender*

Age	Toronto	Southeastern Ontario	**Total**	**191**
17–29	22	4	26	Male
	27	1	28	Female
30–59	27	11	38	Male
	36	8	44	Female
60+	18	11	29	Male
	18	8	26	Female



Figure 4. Map of Ontario showing location of the four communities

3.2 Circumscribing the variable context

Mindful of Rosenbach's (2002: 71–2) observations regarding the lack of methodological comparability across previous studies of this variable, considerable effort was made to ensure that the analysis is as comparable as possible to more recent studies in terms of the nature of data extraction and circumscription of the variable context. To do so, we followed the procedures used by Hinrichs & Szmrecsanyi (2007), Szmrecsanyi & Hinrichs (2008), Wolk *et al*. (2013) and Ljung (1997). Our analysis includes only those tokens of the *s*- and *of*-genitive that could be expressed by either variant without changing, adding or removing any material from the possessor or possessum, beyond the addition of a determiner to the possessum for the *of*-genitive (see Hinrichs & Szmrecsanyi 2007: 445). This meant excluding indefinite possessums (6a), where there is a change of meaning between the two expressions. Also excluded

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were set or 'idiomatic' phrases (6b), 'descriptive' genitives (6c) and partitives (6d), as these have previously been reported to have no interchangeability (Rosenbach 2002: 29), and cases where the genitive phrase has a postmodifier (6e) (see Hinrichs & Szmrecsanyi 2007: 447 and Ljung 1997: 30).

(6) (a) Indefinite possessum (change of meaning): *a designate of the mayor ≠ the mayor's (only) designate*
(b) Set phrases (including in proper place names): *the Village of Bedford Park*, *Murphy's Law*, *Peggy's Cove*, *'for God's sake'*
(c) Descriptive and measure genitives: *a men's change-room*, *children's magazines*, *an hour's wait*, *a month's delay*
(d) Partitives: *some of the people*, *one of the problems*
(e) Genitive phrases with post-modifier: 'sports is the attempt to master *the combination of your mind and body and the pursuit of something*'

In addition, we discovered a tremendous number of additional cases of categorical behaviour in these materials. Standard practice in variation analysis is to exclude contexts that are found with ≤ 5 per cent or ≥ 95 per cent of one variant or the other (see Guy 1988: 131). For example, human *proper name* possessors, such as (7), were realized 99 per cent of the time (N = 475/481) with the *s*-genitive.[8]

(7) (a) That's ***Marissa's*** *dog.* (N/D/26/M)
(b) She had said, 'Well I'm gonna give you *the number* ***of Lindsay***,' 'cause I had met Lindsay a few times during high school. And she said, 'I'm gonna give you ***Lindsay's*** *number* because she's taking E-C-E too, and you guys . . . ' (b/C/30/F)

Units of temporal measure, as in (8a–e), were realized 95 per cent of the time with the *of*-genitive (N = 171/181) and were also excluded.[9]

(8) (a) I could see how *the youth* ***of today*** could be overcome with ennui. (N/5/50/F)
(b) Well, that's ***today's*** *world*, right? (N/7/38/F)
(c) What's gonna be *the crisis* ***of the day***? (b/L/55/F)
(d) . . . in *all the years* ***of my life,*** never- never raised any stink- (l/L/21/M)
(e) Save power, do it at *the height* ***of like the summer*** . . . (N/I/24/M)

Non-human animate (animal) possessors (i.e. *the turtle's face*, *the name of the pig*, *a polar bear's fur*), while variable, were very sparse (N = 26) and so have been excluded. Even accounting for all these exceptional distributions, further scrutiny of the data exposed additional near-categorical contexts as will be detailed in section 4.1.

The principal finding of earlier research on the genitive is that the *s*-variant is extending from marking humans and other animate beings, to collective/organization nouns, and also possibly to geographic locations. Concrete or abstract inanimate

[8] Example (7b) contains an exceedingly rare *of*-genitive with a proper name possessor, which is immediately followed (within a few seconds of speech) by the same possessor using the *s*-genitive. This highlights how misrepresentative a single token can be of broader trends in a data set.

[9] It is interesting to note that all but one instance of *s*-genitive (N = 10) in this context is with the lexical item *today* as the possessor, as in (8b) *today's world* (also: *today's standards*). Although the data are sparse, it is possible this is a lexical effect.

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possessors, meanwhile, largely retain the *of*-form. This makes different types of possessors particularly relevant to the prevailing issues on genitive variation and thus key to our investigation. Because one of the goals is methodological compatibility with previous studies and future replicability, in section 3.3 we detail our procedure for coding animacy.

3.3 The categorization of non-human nouns

A critical decision is how to categorize *collectives* and *organizations*. Previous studies have applied different labels, undoubtedly due to the nature of this semantic class:

> Especially prevalent cases of metonomy are the use of names to refer both to organizations (e.g. IBM) and to characteristic members of them, and the use of place names (e.g. Russia) to refer both to organizational entities and geographical places or inhabitants of them. **Terms belonging to these semantic classes are systematically ambiguous** . . . organizations are often presented as groups of humans engaging in actions that are typically associated with humans. (Zaenen *et al*. 2004: 10–11, emphasis ours)

Mair (2006b: 147, data from Raab-Fischer 1995) and Rosenbach (2006: 105) make a distinction between humans and collective nouns. Similarly, Hinrichs & Szmrecsanyi (2007: 449) use the term *collective* to refer to the category that Zaenen *et al*. call *organizations* (or [ORG]), which they define as 'collectivities of humans when displaying some degree of group identity' with 'a collective voice/purpose' (2004: 11).[10] Under this classification scheme, 'a group with collective action, such as a mob' would be coded as human rather than organization, because it does not display a collective voice or purpose.

In the interest of comparability, we use the Zaenen *et al*. classification for this study, and label the category 'collective/organizations'.[11] This includes examples such as *the public* in (9) and *the head table* and *education* in (10).

(9) (a) That was ***the public's*** *perception* of the east-end. (N/J/41/F)
(b) *the reaction* ***of - of the public*** was you-know . . . (N/n/53/F)

(10) (a) You're not supposed to take ***the head table's*** *food* you-know. (5/k/18/M)
(b) . . . and I would say it's ***education's*** *fault*. (N/g/55/F)

Collective/organizations are by definition animate, as they are comprised of humans; however, in context of the animacy hierarchy given in (5), they fall somewhere below humans but above concrete and abstract inanimates (see e.g. O'Connor *et al.* 2013: 97). Even a lexical item as canonically inanimate as a *table*, as in (10a) *the head table*,

[10] O'Connor *et al.* (2013: 97) also use Zaenen *et al*.'s classification scheme, referring to this category as *Organizations*. Szmrecsanyi (2013: 69) collapses this distinction further, distinguishing only between human and non-human.

[11] We adopt this label in order to highlight that there is some evidence that collectives and organizations are separate categories. Jankowski (2013) separated organizations and collectives based on whether the 'group with collective action' did or did not display some kind of 'collective voice or purpose'. Organizations patterned more with inanimates in her (written) data, while collectives patterned more with humans (2013: 54–5, 80–2).

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can serve as a metonym for the collection of people who are sitting at it – the food in question belongs to the people *at* the table, not to the physical object itself – making *the head table*, in this case, a collective/organization.

Another important category to code consistently is place-possessors. As Zaenen *et al*. (2004: 11) describe: 'There are two different problems with the delimitation of place. On the one hand, any location can be a place, e.g. a table, a drawer, a pinhead, . . . On the other hand some places can be thought of as ORGs.' We again follow their coding scheme here, in which 'only potential locations for humans' can qualify as places, such as *the world* in example (1b), and the examples in (11):

(11) (a) . . . like ***Canada's*** *Silicon Valley* right? (I/q/22/M)
(b) I went to it and it was all on, um, ***China's*** *boom* right now (N/$/44/M)
(c) You'll see pictures of ***other cities'*** *ghettos* (I/d/19/M)

Rosenbach (2002: 248–50) uses the term *personification* to describe this effect, a process of *metaphorical extension*. In order to test whether the *s*-genitive is spreading to these types of situations we paid particular attention to the context of place names, which could refer to either a location or to the people who make up a collective/organization. For example, ***China*** in (11b) was coded as a place, as it arguably refers to the country as a political and geographical entity. In contrast, ***Toronto***, in (12a), does not refer to the city of Toronto, but rather to a sports team. In (12b) ***the museum*** is acting as a metonym for the *staff* of the museum (who might have an *idea*). The examples in (12) were therefore coded as collective/organizations.

(12) (a) I want to see ***Toronto's*** *home games*. (I/1/51/M)
(b) . . . talk about what would be the best pose, what ***the museum's*** idea of the pose is and ah, can the T-Rex naturally run like that? (b/f/22/M)

Two additional categories are relatively straightforward: non-concrete (or 'abstract') inanimates, such as *democracy* in (13) and concrete inanimates, as previously in (4a) (*the bike*).

(13) (a) When that goal went into the net it was then that I knew *the true meaning* ***of democracy***. (N/n/53/F)

3.4 The final data set

Collecting sufficient non-human possessors proved to be one of the biggest challenges of this study. The data comprise highly informal conversations in which people discuss intimate topics, often dominated by stories about their families and friends – in other words, they talk about humans. Non-human genitives were sparse, particularly collectives, organizations and places, the crucial types implicated in change. Preliminary extraction from 100 individuals yielded only 304 non-human tokens containing only 15 *s*-genitives. Our strategy to mitigate this imbalance was to extract only non-human genitives for another 90 individuals.

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Table 2. *Overall distribution of genitive variants in Ontario English (N = 1,368)*

s-genitive		*of*-genitive	
N	**%**	N	**%**
639	**47**	729	**53**

With this procedure and after the exclusions mentioned above, we accumulated 1,368 tokens for analysis. The overall distribution of genitive variants is shown in table 2. The genitive alternation in Ontario English appears to be robust, with 47 per cent *s*-genitive and 53 per cent *of*-genitive. What factors determine when one variant will occur rather than the other? We now turn to the linguistic factors other than animacy that have been claimed to influence the alternation.

3.5 Other internal linguistic factors

A number of internal factors are consistently reported as influencing the selection of *s*- or *of*-genitive. These include the end weight of the possessor and possessum, the phonological shape of the possessor, the type of possessor relationship (non-prototypical or prototypical) and persistence, i.e. the influence of a previous instance of *s*- or *of*-genitive. We introduce each of these predictors in turn.

The principle of end weight dictates that shorter constituents will precede those that are 'heavier' (Hinrichs & Szmrecsanyi 2007: 453–5; Szmrecsanyi & Hinrichs 2008: 292–3, 299–300). We coded for this following the methodology of Szmrecsanyi & Hinrichs (2008: 299–300), by counting the number of 'graphemic words' in each possessor and possessum, and using that as a gauge of their relative 'weight' (see also Börjars *et al*. 2013: 134–5). This predicts that when a possessor is fewer words than the item it possesses, the possessor will take the *s*-genitive, as in (14a), which has a one-word possessor (*Americans*) and two-word possessum (*grand plan*). Conversely, the *of*-genitive is more likely when the possessum is fewer words than the possessor, as in (14b), where the possessor is two words (*certain professors*) and the possessum only one (*feelings*).[12]

(14) (a) . . . acquiescing too much to ***Americans'*** *grand plan* to have one defense system for North-America. (N/J/41/F)
(b) . . . on the basis of your work and the, ah, *the feelings* ***of certain professors*** you're streamed off into different things. (I/f/27/F)

The presence of a sibilant as the final phonological segment of a possessor, such as with the plural *nuns* in (15a) or with *research* in (15b), has previously been found to

[12] A determiner is not counted as part of the possessum length, because a determiner would not be present in the *s*-genitive: ***certain professors'*** *feelings*.

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discourage the use of the *s*-genitive (Altenberg 1982; Szmrecsanyi & Hinrichs 2008: 299).

(15) (a) I was taking *the original material* ***of the nuns*** because that's the first material we have of women anywhere in the world . . . (N/i/30/F)
(b) I had *the physical aspect* ***of the research*** . . . . (3/E/18/M)

Hinrichs & Szmrecsanyi refer to this as a 'phonological *horror aequi* effect' in which speakers 'avoid an immediately adjacent sibilant in the form of an *s*-genitive' (Hinrichs & Szmrecsanyi 2007: 452)[13]

A third factor is possessor relation. Recent studies (Wolk *et al*. 2013: 397, see also Grafmiller 2010: 18) use a typologically based distinction of 'prototypical vs non-prototypical' based on Rosenbach (2002: 58–64, 120–6). *Prototypical* possessors include body parts (16a), kinship terms (16b) and whole/part relationships of concrete inanimate things (16c). Permanent/legal ownership, as in (16d), is also considered by many to be 'a central meaning of the English *s*-genitive' (Rosenbach 2002: 121, citing Taylor 1989, 1995), and so is considered prototypical possession in this classification system.

(16) (a) . . . working with *the joints* ***of the body***. (N/G/26/F)
(b) . . . and I guess ***his friend's*** *brother* answered the phone. (2/i/19/F)
(c) They had a plaque on *the wall* ***of that building***. (N/[/85/M)
(d) We used to go to ***this lady's*** *house* to steal zucchinis. (4/J/19/M)

All others are *non-prototypical* possession. Examples are given in (17):

(17) (a) I was *president of* ***the organization***. (N/d/83/M)
(b) I don't know ***the man's*** *name*. (b/R/77/M)
(c) She's ah, you know, on ***Canada's*** *best-dressed women's list* (N/L/53/F)
(d) . . . near ***the principal's*** *office*, with the photos . . . (N/^/40/F)
(e) . . . going up and down *the coast* ***of British Columbia***. (N/Q/72/F)
(f) . . . might have a book on the *history* ***of Burnt River*** maybe? (r/f/63/M)

The prediction is that prototypical possessors will be more likely to take the *s*-genitive (Wolk *et al*. 2013: 398), since the 'possessor and possessum form a very tight, if not inseparable, relation' that 'should be encoded by more implicit linguistic means' (Rosenbach 2002: 123).

Finally, it has been demonstrated that genitive choice is affected by which variant was used in the most recent prior genitive token. If an *s*-genitive has been used within the previous 100 words, then the likelihood increases that the next instance of a variable genitive will be an *s*-genitive. If an *of*-genitive is used, then it is less likely that the next variable genitive used will be an *s*-genitive. This is due to the effect of the processing constraint of *persistence* (Hinrichs & Szmrecsanyi 2007: 455; Szmrecsanyi 2006: 87–

[13] Unlike the *horror aequi* (Rohdenburg 2003: 236; Rudanko 2003: 662), which specifies the avoidance of adjacent identical *grammatical* structures, this is a case of users attempting to avoid ambiguity between the *s*-genitive inflection and the regular English plural inflectional morpheme.

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101) – a previous instance is believed to prime an upcoming instance, and the speaker reuses the same form.

4 Results

4.1 Human vs non-human possessors

Figure 5 shows that a full 89 per cent of the human possessors take the *s*–genitive, and 92 per cent of the non-human possessors take the *of* genitive.[14] Given the distributional results in figure 5, it is evident that most contexts are invariant once humanness has been factored into the analysis. This is consistent with Szmrecsanyi & Hinrichs' analysis of the vernacular speech of traditional British dialects (FRED) (see note 2), where 'human possessors – for all intents and purposes – categorically trigger the *s*-genitive' (2008: 303).

Further examination within the human and non-human contexts revealed additional splits of this type in the data. First, we consider the distributions according to the semantics of the possessor relationship: prototypical possession, examples in (16a–d), or non-prototypical possession, examples (17a–f). Prototypical possessors (body parts, kinship terms, whole/part relationships of concrete inanimates and permanent/legal ownership) are expected to favour the *s*-genitive (Wolk *et al*. 2013: 398; Rosenbach 2002: 121). This is the case in our data: of the 390 prototypical contexts, a full 305 (78 per cent) are with the *s*-genitive.

This is not the whole story, however. Prototypical human possessors (figure 6), are realized with the *s*-genitive 96 per cent of the time, while prototypical non-human

[14] Recall from section 3.3 above that collective/organizations, while not inanimate, are considered 'non-human'.

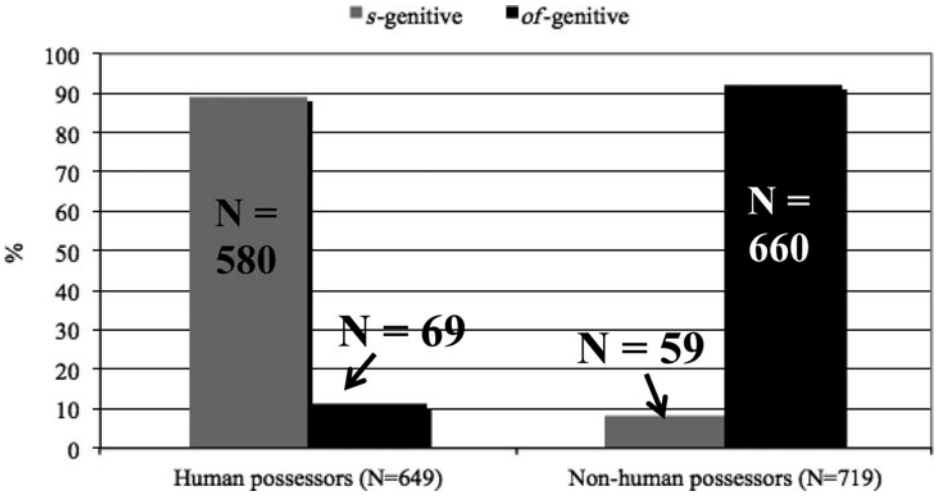


Figure 5. Proportion of genitive variants by animacy of possessor in Ontario English

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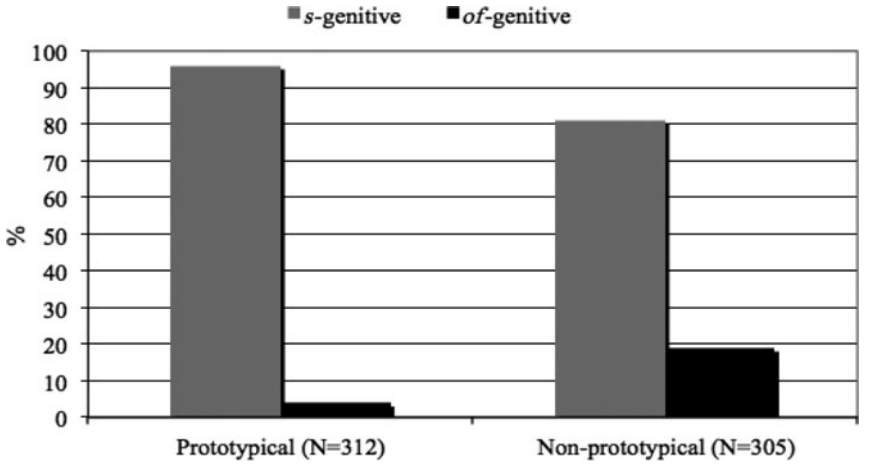


Figure 6. Proportion of *s*- and *of*-genitive with human possessors by possessor relation in Ontario English

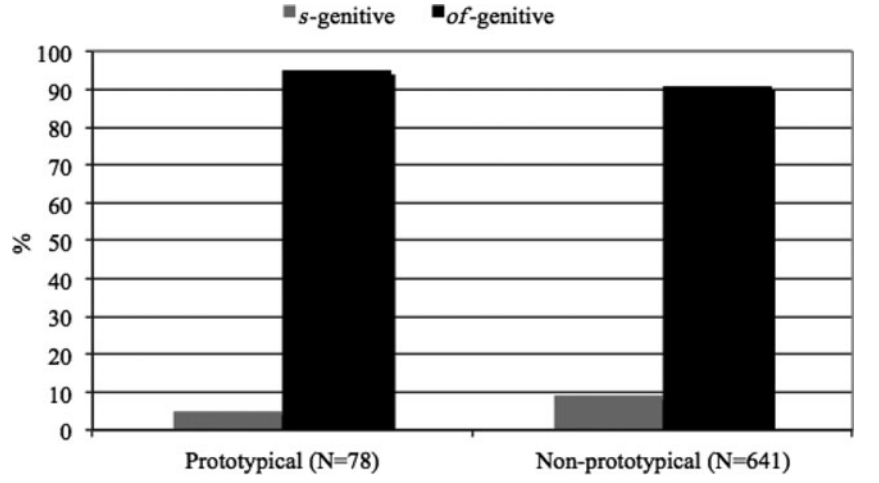


Figure 7. Proportion of *s*- and *of*-genitive with non-human possessors by possessor relation in Ontario English

possessors (figure 7), are realized with the *of*-genitive 95 per cent of the time. These distributions fall out from the glaring animacy distinction shown in figure 5. In short, the prototypical possessors in figure 6 may well favour the *s*-genitive because they are prototypical, but (at least in these data) this cannot be disentangled from the additional fact that they are human. Similarly, the non-human possessors in figure 7 are mostly found with the *of*-genitive. Here too non-prototypical types overlap nearly entirely with non-humans.

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Variation in a system can, of course, only be modeled when variation is present. If categorical contexts are included in an analysis, they will contaminate the variable system. Therefore, following standard variationist practice, we exclude contexts with ≤ 5 per cent or ≥ 95 per cent of one variant or the other (Guy 1988: 131). Based on the distributions in figure 6 and figure 7, this requires additionally restricting our analysis to only *non-prototypical* contexts.

Having successfully isolated the context of variation within the genitive system we can proceed to model the alternation between the *s*- and *of*-forms. If genitive alternation is changing as predicted in section 2, it will be revealed in the patterns of variation. We now test the claim that the animacy constraint for genitives is extending to certain non-human possessors, such as collective/organizations ((18a–b); see also (9), (10), (12)) and geographic locations ((18c–d); see also (10) with the *s*-genitive), but not to other inanimate categories, such as concrete and abstract inanimates ((18e–f); see also (12), (4a)) (Hinrichs & Szmrecsanyi 2007: 440; Mair 2006b: 147; Rosenbach 2003: 386, 2005: 615).

(18) (a) I want *the president* ***of the university*** to shake your hand (I/c/19/F)
(b) He was *the conductor* ***of the Toronto Symphony Orchestra*** (N/?/78/M)
(c) . . . 'cause *the ethnicity* ***of the area*** is . . . (N/p/20/M)
(d) I lived a life of running for my life down *the streets* ***of Oshawa*** with my two young kids. (N/h/55/F)
(e) . . . right through *the wall* ***of the apartment building***. (N/ = /82/M)
(f) Not just you-know sort-of soften *the edges* ***of the problems***. (N/P/73/M)

Figure 8 shows the distribution of non-human, non-prototypical possessors alongside human non-prototypical possessors in apparent time. It is evident that human possessors dominate the system and are near categorical in apparent time. We also see that concrete and abstract inanimates are realized with the *of*-genitive 98 per cent of the time. Both are consistent with figure 5. The precise locus of change is now apparent. The *s*-genitive is increasing only in the non-prototypical collective/organization possessors. Confidence intervals calculated at $p < .05$ confirm that the proportion of *s*-genitives with collectives/organizations (N = 185) by individuals who are 60 or older (4 per cent) is significantly different from that of the < 29 individuals (28 per cent).[15]

For the place-possessors (N = 194), there is an increase from 10 per cent *s*-genitive for the oldest individuals to 17 per cent in the youngest. The boundaries of these confidence intervals *do* overlap,[16] demonstrating that this difference is not significant.

[15] The confidence intervals for the collective/organizations proportions are plotted in figure 8 to the left and right of the markers in solid black lines, and for the place possessors in lighter grey lines. These ranges are interpreted as follows: if the upper limit of a confidence interval for the 60+ individuals (in figure 8, 8 per cent for collective/organizations) is still lower than and does not overlap the lower limit of the corresponding confidence interval for the < 29 individuals (14 per cent in figure 8), then the observed proportions from which the intervals were calculated can be considered significantly different at the $p < .05$ level. This means the observed difference between those values is likely to be an *actual* difference that would still exist if we were to sample more, or other individuals from the same population.

[16] The lower limit of the confidence interval for the < 29 individuals (5 per cent) is *lower* than upper limit of confidence interval for the 60+ individuals (18 per cent).

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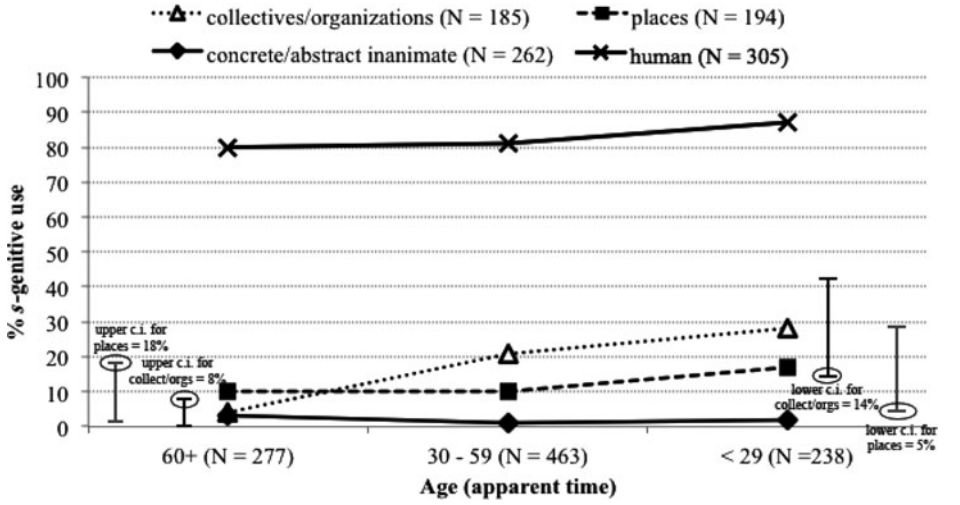


Figure 8. Proportion of *s*-genitive by animacy in Ontario English (non-prototypical possession only)

We therefore have evidence of a change over time for the *s*-genitive. However, this change is localized to the category of collective/organizations. Hereafter, the visibly categorical concrete and abstract inanimates will be removed from the analysis of non-human possessors. This leaves a relatively small set of 684 tokens where variation between -*s* and *of* occurs: 305 human possessors and 379 non-humans, all of which are collective/organizations and places.

In order to determine what mechanisms(s) can explain the choice of variants, we conduct separate fixed-effects logistic regressions of human and non-human possessors using Goldvarb (Sankoff *et al.* 2005). The results are presented in terms of the *s*-genitive. Sum coding shows the relationship between the statistically significant predictors (at the $p < .05$ level). The factor weights reported are probabilities ranging from 0 to 1 indicating whether a tested factor will favour or disfavour the application value (in these analyses, the *s*-genitive). Factor weights higher than .5 indicate that the factor favours the *s*-genitive; factor weights lower than .5 disfavour the *s*-genitive and favour the *of*-genitive (see e.g. Guy 1993; Tagliamonte 2012: 126–9).[17] Internal linguistic factors tested include those detailed in sections 3.3 and 3.5 – final sibilant in the possessor, possessor length, possessum length, persistence and, for non-human possessors only, the animacy type (collective/organization or place). External social factors tested include age, gender and occupation.[18]

[17] Modelling humans and non-humans separately permits us to view the variable grammar of each area of the genitive system (see e.g. Poplack & Tagliamonte 2001; Tagliamonte 2002). The distributional splits presented in section 4.1 provide further support for treating humans and non-humans separately in the logistic regression.

[18] Cross-tabulations of the social factors revealed that *education* interacts with both *occupation* and *age* in the data. Specifically, the youngest individuals (< 29) with less (i.e. no post-secondary) education never use the *of*-genitive

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Table 3. *Logistic regression analysis of non-prototypical human possessors: probability of* s*-genitive in Ontario English*

Input: 0.83	Factor weight	% *s*-gen	TOTAL N: 305 N
FINAL SIBILANT IN POSSESSOR			
Not sibilant	.58	87	257
Sibilant	.16	48	48
range	*42*		
Factors not selected as significant in any analysis: age, sex, occupation, possessor length, possessum length, persistence.			

4.2 Logistic regression

A fixed-effects logistic regression analysis of non-prototypical human possessors is shown in table 3. It reveals that, of the factors tested, there is only *one* statistically significant effect. Possessors with final sibilants – such as *research* in (15b) – highly disfavour the *s*-genitive. The factor weight of .16 for a preceding final sibilant means that even if the possessor is human, if it ends in [s], [z], [ʃ], [ʒ], [ʧ], or [ʤ], it may be realized with the *of*-genitive.

The non-significant results listed at the bottom of table 3 also provide information to add to our overall picture of this variable. Possessor and possessum length were not selected as significant, nor was persistence. Further, none of the social factors tested – occupation, sex or age – were significant. In sum, the occurrence of rare *of*-genitives in this context has no social correlates and is not undergoing change. It is the result of articulatory influences on production.[19]

A fixed-effects logistic regression analysis of the variable inanimate contexts, collective/organizations and places, is shown in table 4. The first observation of note is how *different* these results are from table 3. The most significant factor is persistence. The presence of an *s*-genitive token within the 100 words preceding another token strongly favours another *s*-genitive (.81), while a preceding *of*-genitive disfavours the *s*-genitive (.39). There is also an effect of possessor length, where one-word possessors

for human possessors, and tokens of non-human possessors are sparse for that cohort (N = 5). Distribution of tokens across cells for occupation is much more balanced. Blue-collar workers with less education use the *s*-genitive the most, while white-collar workers with more (i.e. some post-secondary) education use it the least, indicating that the two factors operate as similar indices. Moreover, when run together with the internal linguistic factors, education is never selected as significant. We therefore use only the factor of occupation in the following analyses as a rough measure of socioeconomic status.

[19] In *Maclean's*, a purely written medium, this factor is not significant for human possessors. In (Canadian) Hansard, where recorded speech is transcribed and edited into written form, it is significant in more recent time periods (Jankowski 2013: 86–8). Hinrichs & Szmrecsanyi (2007: 464) rank this phonological factor lower than processing factors for the Brown-family corpora (which include a component of British Hansard), although it is significant in their analysis as well.

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Table 4. *Logistic regression analysis of non-prototypical collective/organizations and place possessors: probability of* s- *in Ontario English*[20]

Input: 0.107	Factor weight	% *s*-gen	TOTAL N: 379 N
PERSISTENCE			
Previous *s*-genitive	.81	38.5	26
No previous genitive token	.49	12	308
Previous *of*-genitive	.39	7	45
range	*42*		
AGE			
< 29	.69	23	75
30–59	.54	14.5	165
60+	.36	6.5	139
range	*33*		
POSSESSOR LENGTH			
1 word	.62	22	106
2+ words	.45	10	273
range	*17*		
OCCUPATION			
Blue collar	.62	20	107
White collar	.45	10	236
range	*17*		
Factors not selected as significant: animacy type (collective/organization or place), sex, possessum length, final sibilant in possessor.			

favour the *s*-genitive (factor weight = .62) and longer possessors disfavour it (factor weight = .45).

Among the social factors, the most important is age. The linear progression towards more *s*-genitives from old to young is a prime indicator of linguistic change. This provides statistical confirmation of the spread of *s*-genitive into these non-human possessors, as also observable in figure 8. Further, individuals who work in blue-collar, manual-labour jobs favour the *s*-variant over white-collar workers, with managerial and customer service jobs, suggesting sociolinguistic value.

The differences in the mechanisms underlying variant choice between human and non-human possessors support the observation that the genitive system is functionally differentiated.[21] Processing effects and the effect of end weight (here, length of the

[20] The Ns for occupation (N = 343) do not add up to the total N of 379. N = 36 tokens were excluded from individuals who could not be classified as either blue or white collar (N = 25 from 'students' and N = 11 from individuals whose occupational status is unknown).

[21] When humans and non-humans are run together in a single model with animacy as an independent factor, animacy is, of course, significant. Human possessors strongly favour the *s*-genitive with a factor weight of .87, while collective/organizations and places strongly disfavour it (factor weights of .19 and .12, respectively). Age,

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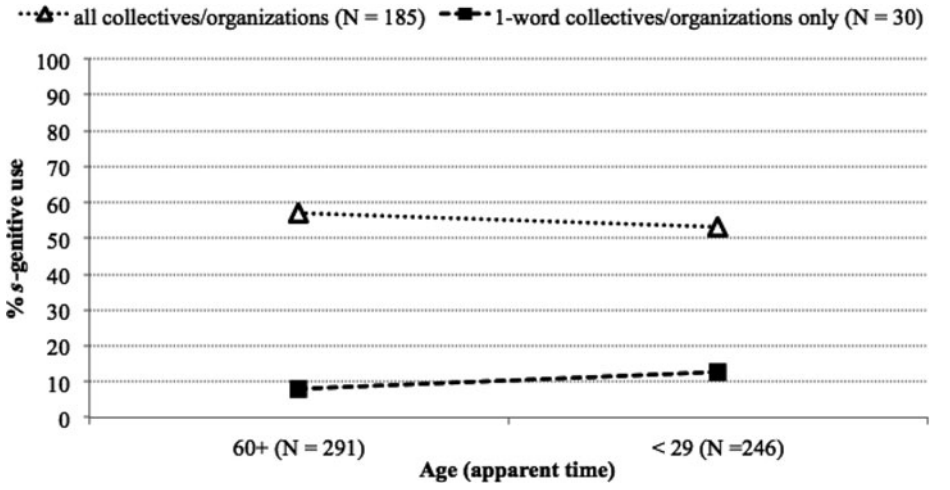


Figure 9. Collective and organization possessors over time, one-word and all lengths (*s*- and *of*-genitive combined)

possessor) favour the spreading form. Ongoing change is currently isolated to non-prototypical collective/organizations (figure 8).

Given that one-word possessors favour the *s*-genitive, there is a possibility that (i) the increase of the *s*-genitive in the collective/organizations is because of an overall increase in one-word collective/organization possessors (both *s*- and *of*-genitive) over time, or (ii) the result of an overall increase over time in collective/organization possessors (again, both *s*- and *of*-genitive) of all lengths. Figure 9 addresses both of these possible interactions, and shows that neither hypothesis is the case. The proportion of one-word collective/organization possessors does not change appreciably between the oldest and youngest speakers, nor does the overall proportion of collective/organization possessors in the corpus. This corroborates the operation of the principle of end weight.

5 Discussion and conclusions

What can we conclude from all this? Most research on the genitive alternation has focused primarily on the question of which factors contribute more or less explanatory value in a model of variation. The distribution of forms in figures 5, 6 and 7 demonstrates that, at least in vernacular speech, nearly all the variation can be explained by the entwined factors of animacy and prototypicality. Once these two factors are taken into account, the arresting divide of genitive variants in contemporary spoken English is exposed: *s*-genitive for humans and *of*-genitive for non-human. Variation exists, but

occupation, possessor length and final sibilant are also significant in that model. However, a single model masks the striking differences visible in comparing table 3 and table 4. The variable grammar for human vs non-human possessors is distinct.

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human possessors, as shown by the analysis in table 3 and discussed in section 4.2, only vary in response to a production factor – if the possessor ends in a sibilant (i.e. *the physical aspect* ***of the research)***, an *of*-genitive can still be co-opted into this part of the system. Other than this, our results show no ongoing change for human possessors; rather, the *s*-genitive has long since saturated that part of the system.

For non-human possessors we have documented a different state of affairs. In these contexts, the *s*-genitive is modestly encroaching into collective/organizations. Therein, alternation between *s*- and *of*-genitive is highly sensitive to persistence, or priming, and more modestly to length of the possessor. This is *not* due to simply an overall increase in either collective/organization possessors or one-word possessors over time (figure 9), indicating that this is a bona fide change in progress.

A *personification* effect by *metaphorical extension* (Rosenbach 2002: 248–50) is clearly relevant to this process (figure 8). If the *s*-genitive is spreading from human contexts back into non-humans (recall that the *s*-genitive is the historically older form), it is unsurprising that it would do so first in those contexts that are arguably closer to humanness in the animacy hierarchy. Even though metonyms like ***the museum*** (11b) fall slightly lower than humans, we can and do get ***the museum's*** *idea*. Collective/organizations (***the public's*** *perception*, ***the head table's*** *food*, ***education's*** *fault*) refer to organized groups of animate beings with a leader, rules and/or a mandate, while places (***Canada's*** Silicon Valley) refer to 'potential locations for humans' (Zaenen *et al*. 2004: 11).[22] All the evidence points to change in progress. However, the overall density of these forms with the *s*-genitive in vernacular speech is low (N = 28/379 collective/organizations, N = 22/379 places) and the frequency moderate (13.2 per cent *s*-genitive combined). Further, the change in progress is localized to collective/organizations (figure 8). All of this, along with the fact that these contexts themselves are so highly restrictive, suggests that the extension of *s*-genitive is only beginning in the spoken language, at least in the vernacular of Ontario.

Given the evidence for change in progress, it is thus not surprising that sociolinguistic effects are also implicated. Blue-collar workers favour the *s*-genitive while white-collar workers, who are expected to have greater need to resort to more formal speech styles (Labov 1990: 232–6), favour the *of*-genitive. This demonstrates that formality differences long-noted for this variable in writing (Altenberg 1982: 268–9) are also active in the vernacular.

Recall that the *s*-genitive was once nearly obliterated by the *of*-genitive (see figure 1), but has been regaining ground since the sixteenth century (Rosenbach 2002: 190; Altenberg 1982: 146–7). Yet even when the *s*-genitive was at its most extreme point of decline in Middle English, it could still be found most often with human possessors. Use of the *s*-genitive with inanimate possessors at that time was more likely in verse texts, or poetry, a genre which is (i) more sensitive to phonological factors (i.e. stress, rhythm) than prose, and (ii) more likely to make use of personification (Rosenbach

[22] Indeed, rare concrete and abstract inanimates with *s*-genitive (N = 6) often have some kind of personification: *the doll's clothes*, *the devil's head* (where 'the devil' is a statue), *death's door.*

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2002: 180). In our contemporary English vernacular data, human possessors are overwhelmingly marked with *s*-genitive, only surfacing as an *of*-genitive in rare cases where the phonotactics are highly disfavouring. Non-human contexts, on the other hand, are the site of ongoing change, and so are subject to the underlying mechanisms that are pushing the change forward.

What is the explanation for those changes? The wealth of studies previously cited (e.g. Biber *at al.* 1999; Hinrichs & Szmrecsanyi 2007; Jankowski 2013; Jucker 1993; Leech *et al*. 2009; Szmrecsanyi & Hinrichs 2008) have found the *s*-genitive with inanimates to be most frequent in written data, especially in journalism. Our findings, in conjunction with Jankowski (2013) in figure 3, where the *s*-genitive for non-humans is visibly more frequent in two written registers,[23] corroborate the hypothesis that written language is *leading the way* for the extension of the *s*-genitive into non-human possessors. This is contrary to the common assumption in historical linguistics that change spreads from vernacular speech to writing (Pintzuk 2003: 525) and opens up new possibilities for studying the contrasts between speech and writing. Hinrichs & Szmrecsanyi suggest that 'the more significant causes of the spread of the *s*-form lie in the area of discourse practices, not the underlying constraint grammar' (2007: 440, citing Mair 2006b: 147). Certainly the finding that persistence exerts the greatest influence on the choice of an *s*-genitive with non-human possessors is consistent with innumerable studies of discourse marking where the use of one variant typically leads to another (Scherre & Naro 1991, 1992).

Of the other statistically significant factors, the effect of end weight is a pervasive cognitive mechanism, while semantically driven spread by metaphorical extension is a ubiquitous process in linguistic change. The spread of the *s*-genitive, as with any variable, is conditioned by multidimensional factors and cannot be attributed to any single cause. An added complication is that the genitive is subject to divergent constraints by register, e.g. spoken data has stronger persistence effects while written data has a stronger effect of possessum length (see Szmrecsanyi & Hinrichs 2008: 302; Hinrichs & Szmrecsanyi 2007: 463–4; Jankowski 2013: 86–91), and only written data, such as journalistic prose, is influenced by economy. We therefore concur with the assertion that 'the probabilistic mechanisms behind genitive choice in press English are, and remain, sufficiently distinct from the factors working on genitive variation in spoken English' (Szmrecsanyi & Hinrichs 2008: 307).

To pursue further study of these trends and patterns, we must compare contexts of variable genitive alternation across a fuller spectrum of written and spoken registers and styles, particularly with inanimate possessors. An encouraging development for future work will be to examine the burgeoning array of new written registers (e.g. blogging, IM, SMS, Facebook and the like). These registers offer an expanded continuum from

[23] Compare 20 per cent *s*-genitives with collective/organizations in vernacular speech of individuals age 30–59 (figure 8, data collected 2002–9) to 46 per cent with non-humans in 2006 Hansard transcripts of formal speech, and 57 per cent with non-humans in 2006 *Maclean's* magazine journalistic prose (figure 3, Hansard and *Maclean's* data from speakers/writers age 30–60 in 2006. See Jankowski 2013 for further details).

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highly formal to extremely informal writing (see Tagliamonte & Denis 2008), which will expose added nuances to the formality continuum.

From a methodological perspective, we suggest that explicit data extraction and coding protocols are crucial in order to identify the precise realm of variability, especially since it is now becoming obvious that this will differ meaningfully across data sets. Also important are well-documented procedures for the circumscription and coding of the variable, particularly in defining and categorizing animacy and prototypicality (see sections 3.3 and 3.5, above). Together, such practices will not only ensure replicability across studies, but will also expand the knowledge base for understanding the mechanisms and motivations for linguistic change in this system. Taking into account contrastive distributional facts in future studies will not only make comparisons across time more accountable, but it will also enable researchers to make more appropriate generalizations across time and space.

In conclusion, our foray into the genitive alternation in Ontario English has demonstrated that the fundamental constraints (animacy, prototypicality) operate in vernacular speech much as reported in other studies, synchronic and diachronic, spoken and written, suggesting long-term drift in this system of grammar. In this variety, as in the only other comprehensive study using vernacular speech that we are aware of (Szmrecsanyi & Hinrichs 2008), the *s*-genitive has virtually gone to completion in human possessors. Compare (19a), from 1682, a type that apparently varies robustly between *s*- and *of*-genitive in diachronic data, to (19b), which is 99 per cent *s*-genitive in our data from the turn of the twenty-first century.

(19) (a) . . . *the brother* ***of the Senechal*** (example 2b of Wolk *et al*. 2013: 383)
(b) . . . ***your president's*** *report* (b/U/69/F)

Extension of the *s*-genitive down the animacy hierarchy into collective/organizations is ongoing. The same trend reported in written registers is in progress in speech but, as we have shown, it is proceeding slowly. It will be interesting to keep watch over non-human possessors as this system continues to evolve.

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